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Inclusion and Self-Determination for Secondary Students with Disabilities: The Effects of Interventions and Classroom Placement

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Abstract

Self-determination, which includes abilities and skills people need to act or cause things to happen in their lives (e.g., self-advocacy, choice-making, problem-solving, goal-setting), is critical for people across the life course, including adolescents learning in inclusive classrooms. Although secondary teachers recognize the value of providing students with opportunities and experiences to build self-determination in inclusive contexts, they often are limited in instructional time to promote self-determination directly and consistently. Students with disabilities are even less likely to build self-determination skills due to restrictive learning environments. This scoping review sought to explore the relationship between self-determination instruction and inclusive contexts for secondary students with disabilities. Full inclusion provides all students with access to the general education curriculum and to meaningful and diverse social interactions. Results showed that self-determination instruction and interventions could promote successful inclusion, but that classroom placement alone does not predict students' levels of self-determination.

Keywords: self-determination, inclusion, disability, secondary

Inclusion and Self-Determination for Secondary Students with Disabilities: The Effects of Interventions and Classroom Placement

According to the Individuals with Disabilities Education Act (IDEA), students with disabilities are required to be educated in the least restrictive environment (LRE) in schools (U.S. Department of Education, 2020). Section 612(5)(a) of IDEA outlines that students with disabilities may only be removed from the general education inclusion setting when the students' needs cannot be met in that classroom placement (IDEA, 2004). Yet, students with disabilities are often placed in more restrictive learning environments and are only exposed to rudimentary "life-skills" content or remedial instruction (Gilley et al., 2021; Kurth et al., 2019; Saunders et al., 2019). As students with disabilities progress through middle and high school, they are even more likely to be separated from general education settings (Williamson et al., 2020). Although some secondary students with disabilities might have Individualized Education Programs (IEPs)

designed to supplement their learning in general education classrooms and focus on academic, behavioral, and social-emotional areas for growth, it is also possible that many secondary students with disabilities experience inequitable and segregated learning experiences because of their disability status (Jimenez & Staples, 2015).

Moreover, students with disabilities who learn in inclusive classrooms benefit from being exposed to the grade-level curriculum and their typically developing peers. For example, Agran et al. (2020) identified benefits of pursuing age-aligned content for students with disabilities rather than focusing on more limited specialized instruction in segregated classrooms, including (a) higher levels of academic growth and achievement, (b) improved communication skills, and (c) an increase in self-determination abilities and skills. Students with and without disabilities also benefit from social interactions with peers with diverse strengths and support needs in inclusive spaces (Carter et al., 2016). Furthermore, high-level, rigorous grade-level instruction is meant to prepare students with disabilities for positive postsecondary outcomes such as access to higher education and competitive integrated employment (Mazzotti et al., 2021). Opportunities to access higher education for students with disabilities are expanding due to the Higher Education Opportunities Act of 2008 (Grigal et al., 2012), and self-determination is a high predictor of postsecondary success for all students. Therefore, it is essential that all students with disabilities gain access to and have opportunities to make meaningful progress in general education curriculum to obtain inclusive pathways in their futures (Gilley et al., 2021).

Self-Determination and Inclusion

According to Causal Agency Theory, self-determination is defined as a "dispositional characteristic manifested as acting as the causal agent in one's life" (Shogren et al., 2015, p. 258). Causal Agency Theory affirms the right for students with disabilities to make their own decisions while recruiting supports and opportunities that allow them to utilize such skills and abilities (Wehmeyer, 2004). Skills, abilities, and attitudes associated with self-determination include choice-making, decision-making, problem-solving, goal setting and attainment, self-management, self-advocacy and leadership, self-awareness, and self-knowledge (Hagiwara et al., 2021). These skills, abilities, and attitudes develop as students navigate life experiences and act in service of their own goals (Shogren et al., 2015). How students express and engage in self-determined actions is also impacted by environmental, personal, and other contextual factors (e.g., age, support needs, cultural values, family beliefs; Hagiwara et al., 2021; León et al., 2015; Shogren et al., 2018a).

Promoting self-determination has been linked to an increase in access to the general education curriculum (Raley et al., 2020; Shogren et al., 2012) and identified as a positive predictor for postsecondary success (Mazzotti et al., 2021; Rowe et al., 2021). Further, inclusive contexts have the potential to increase self-determination for students with and without disabilities (Kurth et al., 2019). For example, Parker et al. (2020) found that when students with disabilities received instruction on abilities, skills, and attitudes associated with self-determination, they were more likely to feel comfortable participating in general education settings. Additionally, higher levels of self-determination are associated with well-being and satisfaction in life (Wehmeyer, 2019). In addition, self-determination allows students to develop autonomous motivation versus controlled motivation (León et al., 2015; Wehmeyer, 2019).

However, students with disabilities often report lower levels of self-determination compared to students without disabilities (Garrels & Palmer, 2020; Shogren et al., 2018b). While the relationship between self-determination and various identity markers (e.g., age, race, gender) is complex (Shogren et al., 2018b), discrepancies in how people perceive their own status of self-determination may be influenced by the more restrictive environments in which many people with disabilities live their lives (Garrels & Palmer, 2020). Such restrictive environments limit opportunities for people to make their own decisions, make and learn from mistakes, and develop their own problem-solving strategies, which are essential for building self-determination (Raley et al., 2020). For instance, Hagiwara et al. (2021) found that "people with disabilities expressed their frustration with the low expectations and lack of opportunities and supports to engage in self-determined actions during their compulsory education and beyond" (p. 15-16). Every person has the right to act as a causal agent in their life, and inclusive spaces naturally facilitate opportunities for people to exercise such rights (United Nations, 2006).

Instructional Practices and Interventions to Promote Self-Determination

Previous literature reviews (Burke et al., 2020; Hagiwara et al., 2017; Konrad et al., 2007) have investigated the effectiveness of evidence-based self-determination interventions and instructional practices. For example, Burke et al. (2020) found that a variety of interventions and practices (e.g., the *Self-Determined Learning Model of Instruction* [SDLMI], *Whose Future Is It Anyway?*, *Next S.T.E.P. Curriculum*, the *Self-Advocacy Strategy*) are effective in promoting self-determination for students with diverse disability levels across the life course. Although the focus of Burke et al. (2020) was not the effects of self-determination interventions and instructional practices as a tool to facilitate inclusion, the authors reported that only 17% ($n = 6$) of the included studies were performed in inclusive contexts. Hagiwara et al. (2017) focused on the use of the SDLMI and found that it has been implemented in various settings (e.g., segregated, inclusive, across grade levels) with positive outcomes (e.g., an increase in access in general education curriculum, higher self-direction in transition planning). However, Hagiwara et al. (2017) focused solely on the SDLMI and excluded other interventions to promote self-determination. Finally, Konrad et al. (2007) reviewed articles concerning the effects of interventions to promote self-determination for students with learning disabilities (LD) or attention deficit hyperactivity disorder (ADHD). Less than 15% ($n = 4$) of the studies included in Konrad et al. (2007) were situated in inclusive classrooms, and in these situations students with disabilities were targeted for intervention separately from their peers in the class.

Although learning in inclusive settings and having opportunities to build self-determination are key predictors for positive postschool outcomes, there is no review of literature focusing on self-determination interventions within inclusive settings. Therefore, there is a need for a review that investigates self-determination interventions that are implemented in inclusive spaces to assess the degree to which an inclusive setting might facilitate more opportunities for students with disabilities to practice skills and abilities associated with self-determination. Although progressing in the general education curriculum and building self-determination should be a focus across K-12 grade levels, the aforementioned reviews noted that most self-determination interventions have been implemented with secondary school-aged students with disabilities rather than with elementary-aged students. Therefore, for the purpose of this scoping review, we focused on secondary school settings.

Purpose

The purpose of this scoping review is to explore the relationship between self-determination instruction and interventions in inclusive spaces for secondary students with disabilities. The following research questions guided a scoping review of literature:

1. To what extent does emphasis on self-determination through interventions and/or instructional practices relate to successful inclusion for students with disabilities in middle and high school classrooms?

2. Do higher levels of self-determination promote access to and participation in the secondary level general education curriculum for students with disabilities?

Methods

A scoping review of literature (Levac et al., 2010) was conducted to broadly understand research that has been conducted on self-determination instruction and interventions that were either performed in general education classrooms or were designed for access to inclusive spaces for students with disabilities. Given the limited research in this area, all peer-reviewed articles that focused on these topics were included.

Inclusion Criteria

In order to understand the trends in the last 20 years, articles published from 2000 to 2022 were included. All articles must have been published in a peer-reviewed journal and written in English. The inclusion criteria included: (a) the article must include or refer to students with disabilities (who had IEPs); (b) the article must report on a study situated in a middle or high school classroom setting; (c) the article must focus on an inclusive setting (defined as students with and without disabilities learning together in the same space); and (d) the article must focus on student self-determination and/or interventions and/or practices to promote student self-determination. Search terms were developed to meet these criteria and based on the three main aspects of the research questions: secondary students with disabilities, inclusion, and self-determination (see Table 1 for a more detailed list of search terms). To conduct the scoping review of literature, both qualitative (e.g., interview) and experimental (e.g., intervention) studies were included.

Table 1
Search Terms

Disability terms	Inclusion terms	Self-Determination terms	Age terms
disabilit*	Inclusion Inclusive Integrated	Self-determination Self-determined	Middle school High school Secondary

Note: disabilit* = disability expanded (i.e., disabilities)

Literature Search Strategy

Articles were identified through four steps. First, we searched the ERIC and PsychInfo databases using different strings of the search terms such as "disability* AND inclusion AND self-determination AND secondary" with a variation of "middle school" and "high school" instead of "secondary." The term "inclusion" was also replaced with either "inclusive" and "integrated" in additional search strings (see Table 1 for a list of search terms). After removing duplicates, this search process produced a total of 87 articles. Second, we added seven additional articles from an ancestral search of the references from the original articles ($N = 94$). Third, the first round of screening entailed reading the titles and abstracts and excluding any articles that did not meet inclusion criteria. Sixty-two articles did not meet these criteria and were excluded from further consideration ($n = 32$). Finally, the next round of screening entailed reading the full articles and excluding those that did not meet the same criteria. Twenty-one more articles did not meet the criteria and were excluded from the review. For example, articles that did not both take place in an inclusive classroom and include students with disabilities in the data collection were excluded. The final number of articles was 11. Figure 1 shows a flow chart of the search process.

Coding Process

First, the first and second authors developed a codebook with multiple dimensions to address the research questions. Then, the first author coded the included articles based on the purpose of the study, the design of the study, the year of publication, any outcome measures used, any interventions implemented (and by whom), the participant demographics (e.g., disability label), situated context (e.g., middle or high school), and key findings. Next, the second author checked 25% of coded dimensions for inter-coder reliability, and then the first and second authors discussed coded articles to ensure consistency with coding and identify themes from key findings across articles that addressed our research questions. We calculated the agreement percentage by adding the total number of agreements and dividing it by the total number of agreements and disagreements, which was 85%. Lastly, the first and second authors further discussed discrepancies until they achieved 100% agreement.

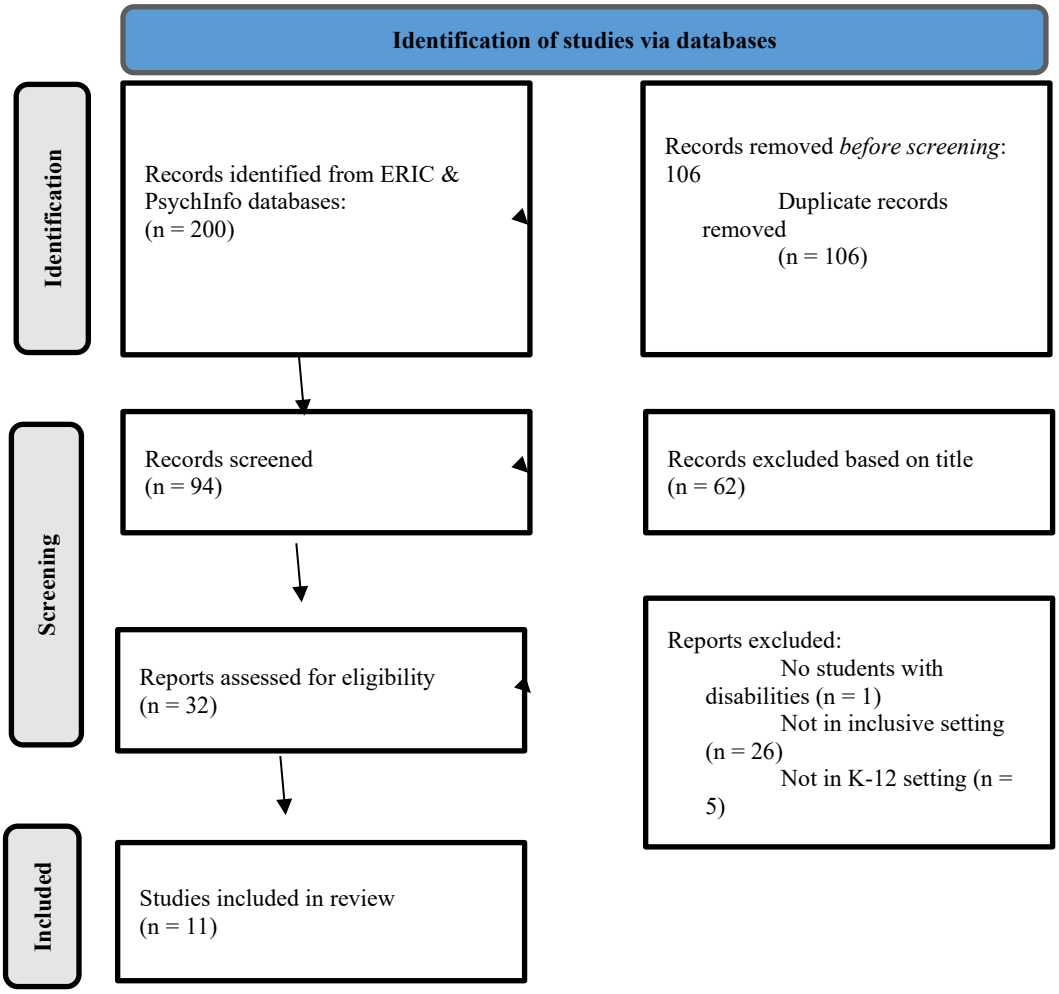

Figure 1: Search Process

Results

The search process resulted in 11 articles. All articles focused on one or more of the following themes: (a) the implementation of interventions designed to increase students' self-determination; (b) the implementation of self-determination interventions also designed to increase students' access to the general education curriculum; and (c) the relationship between inclusion and students' self-reported levels of self-determination. We constructed these themes after a thorough reading of each article. See Table 2 for a full summary of each article. Almost all articles (n = 10; 91%) were from the United States, while one article (9%) was from India. Six articles (55%) involved researcher-led interventions. In the other five articles (45%), researchers analyzed data they collected after a teacher implemented a specific intervention.

Table 2
Summary of Included Articles

Article	Number of Participants	Students' Disability Categories (n)	Participant Grade(s)	Study Design	Theme	Embedded Self-Determination Pedagogical Tool(s)
Agran et al., 2006	3	ID (2), ASD (1)	6-8	Quantitative academic mastery	Access	SDLMI
Eisenman et al., 2015	16	SLD (10), OHI (7), Speech (2)	6-12	Qualitative observational data	Self-Determination	Goal-setting interventions grounded in self-determination
Hughes et al., 2013	47	ID (47)	9-12	Quantitative survey (Student Self-Determination Survey) & qualitative measure of engagement in IEP meetings	Inclusion	Participation in inclusion setting
Lee et al., 2008	42	SLD (32), ASD (1), EBD (3), OHI (6)	9-12	Quantitative Goal Attainment Scaling (GAS) & qualitative observational data used to create an access score	Access	SDLMI

Naraian & Nataraja n, 2013	8	ID (7), ASD (1)	9-12	Qualitative interviews	Inclusion	n/a (no pedagogical tool used)

Article	Number of Participant s with Disabilitie s	Students' Disability Category (n)	Participa nt Grade(s)	Study Design	Theme	Embedded Self-Determination Pedagogical Tool(s)
O'Keeff e & Medina, 2016	n/a	n/a	6-8	n/a	Self-Determination	Embedded instruction regarding self-determination
Palmer et al., 2004	22	ID (20), SLD (2)	6-8	Quantitative survey (SD Arc) & goal attainment score (GAS)	Access	SDLMI
Raley et al., 2018	5	OHI (2), Vision (1), Physical (1), Multiple (1)	9-12	Quantitative survey (SDI: SR) & goal attainment score (GAS)	Access	SDLMI
Raley et al., 2021	185	SLD (108), OHI (81), ASD (13)	9-12	Quantitative survey (SDI:SR)	Self-Determination	SDLMI
Shogren et al.,	101	ID (5), SLD (61), ASD (5),	9-12	Quantitative goal attainment	Access	SDLMI

2021		EBD (2), OHI (20), Physical (2), Speech (4), Hearing (1), Other (1)		score (GAS)		
Zhang, 2001	44	ID (44)	6-12	Quantitative frequency count of self-determined behaviors	Inclusion	Participation in inclusion setting

Note: ASD = Autism Spectrum Disorder; EBD = Emotional & Behavioral Disorder; ID = Intellectual Disability; SLD = Specific Learning Disability; OHI = Other Health Impairment
Note: Disability category counts include students who qualify under multiple categories
Note: Access = theme b (self-determination interventions designed to promote students' access to the general education curriculum); Self-Determination = theme a (interventions designed to promote student self-determination); Inclusion = theme c (the impact of inclusive spaces on student self-determination)

Characteristics of Participants

Participants in the included studies had disability identifications across all 13 categories of disabilities defined by IDEA (U.S. Department of Education, 2020). The total number of participants with disabilities was 473. Almost half of the participants (*n* = 213; 45%) were categorized as having a specific learning disability (SLD). Another 26% of the participants (*n* = 125) reported having intellectual disability (ID). Disability counts included participants who qualified under more than one disability category.

Interventions Designed to Promote Student Self-Determination

SDLMI/GAS Measures. Almost half of the included articles (*n* = 5; 45%) used the SDLMI as an intervention and collected outcome data using Goal Attainment Scaling (GAS; Kiresuk, Smith, & Cardillo, 1994), while another article used the SDLMI and collected data using the Self-Determination Inventory: Student Report (SDI:SR; Raley et al., 2021). Research has established the SDLMI as an effective way for teachers to embed instruction that promotes self-determination in their classrooms (Garrels & Palmer, 2020; Lee et al., 2008; Shogren et al., 2016; Wehmeyer et al., 2012). The SDLMI can be implemented as part of a multi-tiered system of support framework given the flexibility to adjust the intensity of instructional support and time allocated for groups or individual students (Shogren et al., 2016). As an evidence-based practice, the SDLMI allows teachers to guide students to self-direct learning activities that facilitate students to gain skills and abilities and recruit supports and opportunities to achieve their goals. When implementing the SDLMI, teachers deliver lessons in three phases: (1) setting a goal, (2) taking action, and (3) adjusting the goal or plan (Shogren et al., 2019). Students work through a problem-solving process in these three phases, and teachers provide supports as students work toward their goals. The SDLMI framework does not replace curricula but works as a pedagogical tool to help deliver content while supporting the development of self-determination (Shogren et al., 2019). It can be embedded within any content area, and students are shown to implement self-determination skills and abilities in all aspects of their life once they are familiar with the practices (Hagiwara et al., 2021).

After students experience the SDLMI, teachers and researchers often work with students to evaluate their goal progress using Goal Attainment Scaling (GAS). GAS incorporates student-reported measures of achieving a goal that is set at the end of Phase 1 of the SDLMI. Students rate themselves on the GAS rubric using a Likert-type scale from -2 to +2, where +2 indicates that they performed much better than expected, and -2 indicated that they performed much worse than expected. Some researchers also implement the SDI:SR, which is a self-reported survey measure that calculates a level of self-determination.

Self-Determination as a Curriculum Augmentation. Most articles (*n* = 9; 82%) reported that teaching self-determination skills and abilities can be embedded in everyday school learning as a curriculum augmentation, and that this is an effective way of promoting access to the general education curriculum. A “curriculum augmentation” (Agran et al., 2006; Lee et al., 2008; Palmer et al., 2004) is a pedagogical approach that can be applied to any existing content-based curriculum. O’Keeffe and Medina (2016) presented many curriculum augmentations and

strategies that can be used in schools to help students hone their self-determination skills and abilities. The authors argued that interventions targeted at promoting students' self-determination can foster a sense of belonging for students who have been historically marginalized in school settings.

Similarly, Eisenman et al. (2015) studied the social and academic impacts of self-determination interventions on four students with disabilities throughout their time in high school. The researchers conducted student and teacher interviews and collected student grades and progress on Individualized Education Program (IEP) goals. They found that as students were supported in learning self-determination skills and abilities, their academic performance improved. Furthermore, while merely spending time in an inclusive classroom was not a predictor of self-determination or academic success, students tended to succeed in inclusive classrooms that enabled them to practice self-determination skills and abilities such as choice-making and goal-setting. Along with increased self-determination and academic grades, students also showed progress on their IEP goals and were more included to participate in writing new goals.

Several studies showed added benefits to utilizing a curriculum augmentation targeting self-determination. In addition to the fact that embedded self-determination interventions increased students' goal attainment scores, Raley et al. (2018) found that teachers reported a higher level of student engagement in class after implementing the SDLMI. Eisenman et al. (2015) found that teachers who taught self-determination skills and abilities in their classrooms had more positive relationships with their students. Lee et al. (2008) reported that teaching self-determination skills and abilities helped students with behavioral support needs to participate in the general education curriculum. Relatedly, another unintended but beneficial consequence of utilizing curriculum augmentations that teach self-determination skills and abilities is the shifts in teacher mindsets about students with disabilities. When interviewing teachers, Shogren et al. (2021) found that teachers were surprised with what their students with disabilities could accomplish when given the right support.

Self-Determination Interventions Designed to Promote Students' Access to the General Education Curriculum

Multiple articles (n = 7; 64%) discussed how self-determination interventions can increase students' access to the general education curriculum and standards. Agran et al. (2006) implemented the SDLMI with two students with intellectual and developmental disabilities to work toward grade-level academic goals. Before intervention, students demonstrated low mastery in their chosen areas; however, not only were all three students able to reach and maintain mastery with their goals, but also overall academic performance increased.

Lee et al. (2008) conducted a randomized control trial in which 42 students with disabilities in inclusive classrooms across multiple high schools either received the SDLMI or instruction remained business-as-usual. Researchers collected data on access to the general education curriculum by observing and using a momentary time-sampling method. Although the researchers hypothesized that students who developed stronger self-determination skills would be more engaged in the general education curriculum, they found that the curriculum augmentation did not promote greater access to the general education curriculum based on the observational data.

Four of the articles (Agran et al., 2006; Palmer et al., 2004; Raley et al., 2018; Shogren et al., 2021) found high goal attainment scores after the implementation of the SDLMI. Palmer et al. (2004) used a treatment and control group method to compare GAS scores and saw a significant difference between the two groups. After several months, the researchers implemented the SDLMI in the control group as well and saw similar progress made on students' goals.

These articles all also measured students' self-reported self-determination scores using either the Self-Determination Inventory: Student Report (SDI:SR; Raley et al., 2018; Raley et al., 2021; Shogren et al., 2021) or The Arc's Self-Determination Scale (Palmer et al., 2004). Only one of the studies (9%) showed an increase in student-reported self-determination after implementation of the SDLMI (Palmer et al., 2004). The rest of studies found that students did not increase in their self-reported self-determination scores before and after the curriculum augmentation. Raley et al. (2021) measured students' levels of self-determination using the SDI:SR at the beginning, mid-point, and end of the school year. The authors found that student self-determination scores fell at the mid-point of the year but returned to baseline status at the end of the year, regardless of student disability status. However, all of these studies noted that they would expect self-determination scores to increase after students have experienced the SDLMI for a longer period of time.

The Relationship between Inclusive Spaces and Student Self-Determination

While Palmer et al. (2004) found that students with disabilities were working on more content-aligned tasks in inclusion classrooms versus resource classrooms, other studies suggested that merely being in an inclusive space does not seem to bolster students' self-determination (Eisenman et al., 2015; Zhang, 2001). Zhang (2001) collected data pertaining to students with intellectual disability in inclusion versus resource classrooms. The findings showed students with disabilities learning in resource classrooms reported higher levels of self-determination than students learning in inclusive classrooms. They also reported that while inclusive classrooms offer more opportunities for choice and student autonomy, "these settings frequently also fail to provide adequate levels of choice to individuals with disabilities" (Zhang, 2001, p. 358).

In contrast, Hughes et al. (2013) compared the levels of student self-determination between school settings. They measured students' self-determination by the frequency of their utilization of nine self-determination related skills. Students also self-reported their levels of confidence in these skills. The researchers found that students who attended schools with more inclusive models showed higher scores in six of the skills: self-advocacy, choice making, self-reinforcing, self-monitoring, self-evaluation and problem-solving. The remaining three skills (goal setting, self-instruction and decision making) remained constant across schools.

Similarly, Eisenman et al. (2015) examined inclusive school models and the relationship with students' self-determination. They concluded that students with disabilities learning in general education settings would not necessarily increase in their self-determination based on their learning context alone; instead, student success and high levels of self-determination were observed in schools that had an inclusive culture. Many aspects of this kind of school culture can have a profound impact on students' self-determination. For example, closer collaboration between general and special education teachers, positive relationships between students and

teachers, and a collaborative school-wide culture collectively could promote student autonomy and self-determination. Eisenman and colleagues found that "the school's inclusive structures were linked to intermediate student outcomes of (a) demonstrations of self-advocacy skills and other autonomous and self-regulatory behaviors (e.g., asking for help when needed, establishing and monitoring goals), (b) expressions of self-realization and psychological empowerment, and (c) continuing school engagement" (p. 110).

Finally, several studies (n = 4; 36%) focused on social/emotional belonging and happiness as related to inclusion and self-determination. All four studies showed that self-determination supports in an inclusive setting led to increased social goal attainment (Eisenman et al., 2015; Hughes et al., 2013; O'Keeffe & Medina, 2016; Naraian & Natarajan, 2013). O'Keeffe and Medina (2016) proposed self-determination interventions as a way to close the achievement gap. They argued that learning self-advocacy and other self-determination skills could alter employment trajectories for students from vulnerable identity, racial and disability groups. In turn, Naraian and Natarajan (2013) discussed the importance of peer relationships in inclusive settings. Their interviews revealed that students with disabilities who had secure and caring interpersonal relationships were more able to accomplish self-determination goals.

Social Validity

A few studies (n = 4; 36%) examined the social validity of promoting self-determination among the students with disabilities (e.g., Agran et al., 2006; Shogren et al., 2021). In general, results showed that students felt positively about learning self-determination skills. For example, in Gilley et al. (2020), both teachers and students with intellectual disability agreed that self-determination skills were important. Similarly, Raley et al. (2018) reported high social validity scores from both the implementing teacher and students. They also collected feedback for how to improve the implementation of the SDLMI, and students voiced desires for more peer support opportunities, as well as structured outlets in which they might share their individual goals. The implementing teacher in Raley et al. (2018) shared that their experience implementing the SDLMI both bolstered student outcomes and improved their own teaching practices.

Discussion

The purpose of this review was to better understand the literature pertaining to self-determination interventions for students with disabilities in inclusive middle and high school settings and access to the general education curriculum. The review also sought to answer whether inclusive spaces promote self-determination more than restrictive spaces. Overall, findings across the literature support a largely positive relationship between self-determination and inclusion.

In general, studies included mostly students with intellectual disability, with a low representation of students with other disabilities (e.g., autism, emotional and behavioral disorders). This finding is echoed by Trainor et al. (2020) in which the authors called for more self-determination research with students with diverse disability types from diverse cultural and linguistic backgrounds. Nonetheless, the intervention efforts to promote self-determination and inclusion for students with intellectual disability could have stemmed from the historical background that students with intellectual disability have consistently reported lower self-determination status

than students with other disabilities (e.g., learning disabilities; Shogren et al., 2018b; Wehmeyer, 2020).

The Importance of Self-Determination for Students with Disabilities

Many of the studies included in this scoping review showed that students with and without disabilities benefited greatly in many ways from curriculum augmentations used to support self-determination. For example, self-determination strategies and interventions have been shown to reduce academic anxiety and stress in general education settings, allowing students to better engage with the content (Johnson et al., 2021). Furthermore, the findings built upon the research base for self-determination interventions as useful tools for teachers to bolster all students' academic performance as well as their social-emotional wellbeing, feelings of belonging, and peer friendships (Agran et al., 2020; La Guardia & Patrick, 2008; Millen et al., 2019). In addition, two included studies demonstrated that self-determination promoting practices used as curriculum augmentations can help open the door to general education content (Agran et al., 2006; Palmer et al., 2004).

Using self-determination practices as curriculum augmentations enables teachers to embed essential instruction on social/emotional, executive functioning and/or academic learning skills within required academic content (Shogren et al., 2016). Palmer et al. (2004) argued that standards-based reform was exclusionary towards students with disabilities who might not have mastered the skills and knowledge needed to learn how to learn. In other words, standards-based reform does not account for all the other important skills, abilities, and knowledge that students need to develop in order to interact with new content. Embedding self-determination instruction into existing curricula is crucial for teachers who may feel rushed to get through certain content topics when there are other competing demands (e.g., limited scheduling, standardized state testing). Students who struggle to participate in inclusive settings might feel more comfortable sharing their thoughts or attempting to solve a problem when they learn these essential skills. For this reason, small changes to instructional practices to promote learning self-determination skills, abilities, and attitudes can have positive changes on students' classroom performance (Gilley et al., 2021; Parker et al., 2020).

The Importance of Inclusion for Students with Disabilities and Their Levels of Self-Determination

Meaningful inclusion and access to the general education curriculum go beyond placement in a general education classroom, underscored in the articles in this scoping review. Too often advocates for inclusion believe that general education settings are inherently better than special education settings, when it is really the quality of instruction and culture of inclusion that matters (Carter et al., 2016). It should be noted that while Zhang (2001) concluded that students in inclusive classrooms showed no higher levels of self-determination than students in resource settings, the measure of self-determination was based on observation, which is more challenging in a larger inclusive classroom setting than in a small group of students. Raley et al. (2021) found no difference in the self-determination levels between students with and without disabilities in inclusion classrooms. The authors conjectured that they saw no difference in scores because students with disabilities who learn in inclusive spaces have similar opportunities to practice self-determination related skills as do their typically developing peers. However, as presented earlier, the placement of students with disabilities in a general education classroom does not

guarantee that a space is truly inclusive for all students. Embedding self-determination skills in the classroom, school, and across all contexts is critical for students with disabilities to be truly integrated into general education settings (Raley et al., 2021; Shogren et al., 2016). In this way, students will be encouraged to have agency in all aspects of their lives. Learning in a classroom is not an isolated experience; social, emotional and cultural inclusion all play a role in a student's ability and desire to participate in class (Walker et al., 2011). Embedding self-determination instruction can help to promote true inclusion for students with disabilities.

Changing the Perceptions of Students' Skills and Abilities

One theme that emerged from this scoping review that warrants further discussion is the deficit mindset that many stakeholders (e.g., teachers, administrators, families) had about the academic abilities of students with disabilities. Students with disabilities are often characterized as unable to plan, execute planned actions, and solve problems on their own (Garrels & Palmer, 2020), and in one study, Hagiwara et al. (2021) found that families and teachers tended to believe that students with extensive support needs would not benefit from self-determination interventions. In another study, Shogren et al. (2021) found that students with disabilities had lower GAS scores after the implementation of the SDLMI than their peers without disabilities, but that teachers rated them even lower, which may suggest a deficit mindset concerning what these students could accomplish prior to the implementation of the SDLMI. However, results from the implementation of the SDLMI show that this type of student-directed learning helps teachers to see their students as more capable (Shogren et al., 2014). This finding aligns with the intent of the SDLMI to promote lifelong learning and enable students to take a leadership role in the learning process and to set and direct their own attainment of goals.

Limitations

Many of the studies included in this scoping review noted that their results were limited due to a lack of time, which indicates there may have been different effects on students' self-determination levels if curriculum augmentations and data collection had continued over several years. Similarly, researchers expressed that consistency of practitioners with utilizing curriculum augmentations grounded in self-determination regularly was a challenge. It is likely that teachers would benefit from more training in the implementation of these interventions, and ongoing work is needed to examine the extent to which teachers have received training and support to implement self-determination instruction.

Because of the limited number of studies and information each article provided in terms of the relationship between student race/ethnicity or socioeconomic status and self-determination, future work should make sure to gather and analyze this data in conjunction with self-determination related measures. Self-determination is a dispositional characteristic that, like so many other characteristics, can be impacted by multiple factors such as culture or life experiences. For example, one study found that White students without disabilities generally scored higher on the SDI:SR compared to other youth with disabilities and/or from different racial backgrounds (Shogren et al., 2018b). However, because race, self-determination and disability status are highly interrelated in American public schools, these results are contextualized (Annamma et al., 2016; Parker et al., 2020). Ongoing work is needed to examine how self-determination interventions and practices promote access to inclusive spaces for students from diverse race/ethnicity and socioeconomic backgrounds.

Finally, the database searches may not have included all studies on the topic of this review if authors used other language outside the included search terms related to self-determination and inclusion for students with disabilities. Specifically, the fact that the found studies were overwhelmingly conducted in the United States may be because “inclusion” is a highly discussed term in the United States, especially within the consideration for LRE.

Implications for Future Research and Practice

Limited research compares different populations' responses to interventions targeting self-determination. Given this lack of self-determination intervention research with students with disabilities other than intellectual disability, more research across disability categories is needed to provide perspective on levels of self-determination among different populations as well as the widespread effectiveness of self-determination interventions. Moreover, because most of the articles focused on academic goal achievement and performance, future research should examine the effects of the SDLMI and other curriculum augmentations for the purpose of promoting self-determination skills and abilities on social/emotional and behavioral outcomes for students with disabilities. Because students with behavioral support needs often encounter environmental barriers to be successful in general education settings (Agran et al., 2020), students should be given the opportunity and support to practice skills and abilities that provide a sense of belonging, positive peer relationships, and self-advocacy strategies while in the general education space. More research is also needed to assess the impact of various self-determination interventions on students’ social and emotional learning. Goal-setting and problem-solving skills can be easily applied to academic content, but they also play a role in students’ social interactions. Many students with disabilities have social goals in their Individualized Education Plans (IEPs). Therefore, it is important to learn whether practices that promote self-determination can aid students in achieving these goals. Furthermore, social interactions in an inclusive versus restrictive classroom space could impact students’ levels of self-determination and their social and emotional learning. However, ever since No Child Left Behind (NCLB) and the implementation of high-stakes testing, teachers report that they have less time to focus on self-determination and/or social-emotional skills because they must focus on teaching to the state standards (Garrels & Palmer, 2020; Konrad et al., 2007). Therefore, because self-determination skills can help students access the general education curriculum, pedagogy that supports the development of self-determination *and* social-emotional learning needs to be explored.

Finally, while certain articles did conduct measures of social validity (Agran et al., 2006; Giley et al., 2020; Raley et al., 2018; Shogren et al., 2021), more perspectives from people with disabilities are needed in this work. People with disabilities are underrepresented in the disability studies field (Ferguson & Nusbaum, 2012). Further perspectives from these important stakeholders could help tweak interventions and/or promote meaningful change when it comes to self-determination and inclusion. Perspectives from students with disabilities could also help to confront deficit thinking around disability. In sum, self-determination and inclusive environments are two aspects that can have a profound impact on the lives of students with disabilities. Ongoing work should further examine the impact of providing access both to opportunities to engage in self-determination skills and abilities and inclusive, supportive environments in which students with disabilities learn and interact with their peers.

References

*Note: * indicates articles included in the review*

Agran M., Alper, S., & Wehmeyer, M. L. (2002). Access to the general curriculum for students with significant disabilities: What it means for teachers. *Education and Training in Mental Retardation and Developmental Disabilities, 37*(2), 123-133.

*Agran, M., Cavin, M., Wehmeyer, M. L., & Palmer, S. (2006). Participation of students with severe disabilities in the general curriculum: The effects of the self-determined learning model of instruction. *Research and Practice for Persons with Severe Disabilities, 31*(3), 230-241. https://doi.org/10.1177/154079690603100303

Agran, M., Jackson, L., Kurth, J. A., Ryndak, D., Burnette, K., Jameson, M., Zagona, A., Fitzpatrick, H. & Wehmeyer, M. (2020). Why aren't students with severe disabilities being placed in general education classrooms: Examining the relations among classroom placement, learner outcomes, and other factors. *Research and Practice for Persons with Severe Disabilities, 41*(1), 4-13. https://doi.org/10.1177/1540796919878134

Annamma, S. A., Connor, D. J., & Ferri, B. A. (2016). *Dis/ability critical race studies (DisCrit)*. New York, NY: Teachers College Press.

Burke, K. M., Raley, S. K., Shogren, K. A., Hagiwara, M., Mumbardó-Adam, C., Uyanik, H. & Behrens, S. (2020). A meta-analysis of interventions to promote self-determination for students with disabilities. *Remedial and Special Education, 41*(3), 176–188. https://doi.org/10.1177/0741932518802274

Carter, E. W., Asmus, J., Moss, C. K., Biggs, E. E., Bolt, D. M., Born, T. L., Brock, M. E., Cattey, G. N., Chen, R., Cooney, M., Fesperman, E., Hochman, J. M., Huber, H. B., Lequia, J. L., Lyons, G., Moyseenko, K. A., Riesch, L. M., Shalev, R. A., Vincent, L. B., & Weir, K. (2016). Randomized evaluation of peer support arrangements to support the inclusion of high school students with severe disabilities. *Exceptional Children, 82*(2), 209-233. https://doi.org/10.1177/0014402915598780

*Eisenman, L. T., Pell, M. M., Poudel, B. B. & Pleet-Odle, A. M. (2015). "I think I'm reaching my potential": Students' self-determination experiences in an inclusive high school. *Career Development and Transition for Exceptional Individuals, 38*(2), 101–112. https://doi.org/10.1177/2165143414537349

Ferguson, P. M. & Nusbaum, E. (2012). Disability studies: What is it and what difference does it make? *Research & Practice for Persons with Severe Disabilities, 37*(2), 70-80. https://doi.org/10.1177/154079691203700202

Garrels, V. & Palmer, S. B. (2020). A catalyst for academic achievement and self-determination for students with intellectual disability. *Journal of Intellectual Disabilities, 24*(4), 459-473. https://doi.org/10.1177/1744629519840526

Gilley, D. P., Root, J. R. & Cox, S. K. (2021). Development of mathematics and self-determination skills for young adults with extensive support needs. *The Journal of Special Education, 54*(4), 195-204. https://doi.org/10.1177/0022466920902768

Grigal, M., Hart, D., & Weir, C. (2012). A survey of postsecondary education programs for students with intellectual disabilities in the United States. *Journal of Policy and Practice in Intellectual Disabilities, 9*(4), 223–233. https://doi.org/10.1111/jppi.12012

Hagiwara, M., Shogren, K. A. & Leko, M. (2017). Reviewing research on the self-determined learning model of instruction: Mapping the terrain and charting a course to promote

adoption and use. *Advances in Neurodevelopmental Disorders, 1*(1), 3-13. https://doi.org/10.1007/s41252-017-0007-7

Hagiwara, M., Shogren, K. A. & Turner, E. L. (2021). Examining perceptions toward self-determination of people with disabilities: A meta-synthesis. *Journal of Developmental and Physical Disabilities,* 1-21. https://doi.org/10.1007/s10882-021-09823-8

*Hughes, C., Cosgriff, J. C., Agran, M. & Washington, B. H. (2013). Student self-determination: A preliminary investigation of the role of participation in inclusive settings. *Education and Training in Autism and Developmental Disabilities*, *48*(1), 3-17.

Individuals with Disabilities Education Improvement Act, H.R. 1350, Pub. L. No. P.L. 108-446 (2004).

Jimenez, B. A. & Staples, K. (2015). Access to the common core state standards in mathematics through early numeracy skill building for students with significant intellectual disability. *Education and Training in Autism and Developmental Disabilities*, *50*(1), 17-30.

Johnson, E. H., Clohessy, A. B. & Chakravarthy, P. (2021). A self-regulated learner framework for students with learning disabilities and math anxiety. *Intervention in School and Clinic, 56*(3), 163-171. https://doi.org/10.1177/1053451220942203

Kiresuk, T. J., Smith, A., & Cardillo, J. (1994). *Goal attainment scaling: Applications, theory, and measurement.* Hillsdale, NJ: Lawrence Erlbaum.

Konrad, M., Fowler, C. H., Walker, A. R., Test, D. W. & Wood, W. M. (2007). Effects of self-determination interventions on the academic skills of students with learning disabilities. *Learning Disability Quarterly, 30*(2), 89-113. https://doi.org/10.2307/30035545

Kurth, J. A., Ruppar, L. A., Toews, S. G., McCabe, K. M., McQueston, J. A. & Johnston, R. (2019). Considerations in placement decisions for students with extensive support needs: An analysis of LRE statements. *Research and Practice for Persons with Severe Disabilities, 44*(1), 3-19. https://doi.org/10.1177/1540796918825479

La Guardia, J. G., & Patrick, H. (2008). Self-determination theory as a fundamental theory of close relationships. *Canadian Psychology*, *49*(3), 201. https://doi.org/10.1037/a0012760

*Lee, S.-H., Wehmeyer, M. L., Palmer, S. B., Soukup, J. H., & Little, T. D. (2008). Self-determination and access to the general education curriculum. *The Journal of Special Education*, *42*(2), 91–107. https://doi.org/10.1177/0022466907312354

León, J., Núñez, J. L. & Liew, J. (2015). Self-determination and STEM education: Effects of autonomy, motivation, and self-regulated learning on high school math achievement. *Learning and Individual Differences, 43,* 156-163. https://doi.org/10.1016/j.lindif.2015.08.017

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5*(1), 69. https://doi.org/10.1186/1748-5908-5-69

Mazzotti, V. L., Rowe, D. A., Kwiatek, S., Voggt, A., Chang, W.-H., Fowler, C. H., Poppen, M., Sinclair, J., & Test, D. W. (2021). Secondary transition predictors of postschool success: An update to the research base. *Career Development and Transition for Exceptional Individuals, 44*(1), 47–64. https://doi.org/10.1177/2165143420959793

Millen, K., Dorn, B., & Luckner, J. L. (2019). Friendships and self-determination among students who are deaf or hard of hearing. *American annals of the deaf*, *163*(5), 576-595. https://doi.org/10.1353/aad.2019.0004

*Naraian, S. & Natarajan, P. (2013). Negotiating normalcy with peers in contexts of inclusion: Perceptions of youth with disabilities in India. *International Journal of Disability,*

Development and Education, 60(2), 146–166. http://dx.doi.org/10.1080/1034912X.2013.786565

*O'Keeffe, S. B. & Medina, C. M. (2016). Nine strategies for helping middle school students weather the perfect storm of disability, diversity, and adolescence. *American Secondary Education.* 44(3), 72-87.

*Palmer, S. B., Wehmeyer, M. L., Gipson, K., & Agran, M. (2004). Promoting access to the general curriculum by teaching self-determination skills. *Exceptional Children*, *70*(4), 427-439. https://doi.org/10.1177/001440290407000403

Parker, J. S., Garnes, J. N., Oliver, E. D., Amabile, A. & Sarathy, A. (2020). It takes a village: Understanding African American high school students' self-determination in school. *School Psychology Review, 49*(2), 111-129. https://doi.org/10.1080/232966X.2020.1717371

Raley, S. K., Burke, K. M., Hagiwara, M., Shogren, K. A., Wehmeyer, M. L. & Kurth, J. (2020). The self-determined learning model of instruction and students with extensive support needs in inclusive settings. *Intellectual and Developmental Disabilities, 58*(1), 82-90. https://doi.org/10.1352/1934-9556-58.182

*Raley, S. K., Shogren, K. A., & McDonald, A. (2018). Whole class implementation of the self-determined learning model of instruction in inclusive high school mathematics classes. *Inclusion*, *6*(3), 164–174. https://doi.org/10.1352/2326-6988-6.3.164

*Raley, S. K., Shogren, K. A., Rifenbark, G. G., Lane, K. L., & Pace, J. R. (2021). The impact of the self-determined learning model of instruction on student self-determination in inclusive secondary classrooms. Remedial and Special Education, 42(6), 363-373. https://doi.org/10.1177/0741932520984842

Rowe, D. A., Mazzotti, V. L., Fowler, C. H., Test, D. W., Mitchell, V. J., Clark, K. A., Holzberg, D., Owens, T. L., Rusher, D., Seaman-Tullis, R. L., Gushanas, C. M., Castle, H., Change, W., Voggt, A. Kwiatek, S. & Dean, C. (2021). Updating the secondary transition research base: Evidence-and research-based practices in functional skills. *Career Development and Transition for Exceptional Individuals*, *44*(1), 28-46. https://doi.org/10.1177/2165143420958674

Saunders, A. F., Root, J. R. & Jimenez, B. A. (2019). Recommendations for inclusive educational practices in mathematics for students with extensive support needs. *Inclusion, 7*(2), 75-91. https://doi.org/10.1352/2326-6988-7.2.75

*Shogren, K. A., Hicks, T. A., Raley, S. K., Pace, J. R., Rifenbark, G. G., & Lane, K. L. (2021). Student and teacher perceptions of goal attainment during intervention with the self-determined learning model of instruction. *The Journal of Special Education*, *55*(2), 101–112. https://doi.org/10.1177/0022466920950264

Shogren, K. A., Little, T. D., Grandfield, E., Raley, S., Wehmeyer, M. L., Lang, K. M. & Shaw, L. A. (2018a). The self-determination inventory- student report: Confirming the factor structure of a new measure. *Assessment for Effective Intervention, 45*(2), 1-11. https://doi.org/10.1177/1534508418788168

Shogren, K. A., Palmer, S. B., Wehmeyer, M. L., Williams-Diehm, K., & Little, T. D. (2012). Effect of intervention with the self-determined learning model of instruction on access and goal attainment. *Remedial and Special Education, 33*(5), 320–330. https://doi.org/10.1177/0741932511410072

Shogren, K. A., Plotner, A. J., Palmer, S. B., Wehmeyer, M. L., & Paek, Y. (2014). Impact of the self-determined learning model of instruction on teacher perceptions of student capacity

and opportunity for self-determination. *Education and Training in Autism and Developmental Disabilities*, 440-448.

Shogren, K. A., Raley, S. K., Burke, K. M., & Wehmeyer, M. L. (2019). The self-determined learning model of instruction: Teacher's guide. *Kansas University Center on Developmental Disabilities.*

Shogren, K. A., Shaw, L. A., Raley, S. K. & Wehmeyer, M. L. (2018b). Exploring the effect of disability, race-ethnicity, and socioeconomic status on scores on the self-determination inventory: Student-report. *Exceptional Children, 85*(1), 10-27. https://doi.org/10.1177/0014402918782150

Shogren, K. A., Wehmeyer, M. L. & Lane, K. L. (2016). Embedding interventions to promote self-determination within multitiered systems of supports. *Exceptionality, 24*(4), 213-224. http://dx.doi.org/10.1080/09362835.2015.1064421

Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Forber-Pratt, A., Little, T. J. & Lopez, S. (2015). Causal agency theory: Reconceptualizing a functional model of self-determination. *Education and Training in Autism and Developmental Disabilities, 50*(3), 251-263.

Trainor, A. A., Carter, E. W., Karpur, A., Martin, J. E., Mazzotti, V. L., Morningstar, M. E., Newman, L. & Rojewski, J. W. (2020). A framework for research in transition: Identifying important areas and intersections for future study. *Career Development and Transition for Exceptional Individuals*, *43*(1), 5-17. https://doi.org/10.1177/2165143419864551

The United Nations. (2006). Convention on the Rights of Persons with Disabilities. Treaty Series, 2515, 3.

U.S. Department of Education. (2020). *42nd annual report to congress on the implementation of the individuals with disabilities education act, 2020.*

Walker, H. M., Calkins, C., Wehmeyer, M. L., Walker, L., Bacon, A., Palmer, S. B., & Johnson, D. R. (2011). A social-ecological approach to promote self-determination. *Exceptionality*, *19*(1), 6-18. https://doi.org/10.1080/09362835.2011.537220

Wehmeyer, M. L., Shogren, K. A., Palmer, S. B., Little, T. D. & Boulton, A. (2012). The impact of the self-determined learning model of instruction on student self-determination. *Exceptional Children, 78*(2), 135-153. https://doi.org/10.1177/001440291207800201

Wehmeyer, M. L. (2004). Beyond self-determination: Causal agency theory. *Journal of Developmental and Physical Disabilities, 16*(4), 337-359. https://doi.org/10.1007/s10882-004-0691-x

Wehmeyer, M. L. (2020). Self-determination in adolescents and adults with intellectual and developmental disabilities. *Current Opinion in Psychiatry, 33*(2), 81-85. https://doi.org/10.1097/YCO.0000000000000576

Williamson, P., Hoppey, D., McLeskey, J., Bergmann, E. & Moore, H. (2020). Trends in LRE placement rates over the past 25 years. *The Journal of Special Education, 53*(4), 236-244. https://doi.org/10.1177/0022466919855052

*Zhang, D. (2001). Self-determination and inclusion: Are students with mild mental retardation more self-determined in regular classrooms? *Education and Training in Mental Retardation and Developmental Disabilities, 36*(4), 357–362.

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Culturally and Linguistically Responsive Teaching: A Literature Review

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Abstract

Over 200,000 individuals are studying to be educators in the United States in higher education programs, generally aimed at preparing educators to instruct monolingual, middle-class students (Cochran-Smith et al., 2020; Zhang-Wu, 2021). Coincidentally, in the last 30 years, the United States school system has experienced an 80% increase in students from culturally and linguistically diverse (CLD) backgrounds as English Language Learners (ELL), representing 10% of school enrollment or roughly 5 million students (Faltis & Valdés, 2016; Zhang-Wu, 2021). Despite this growth in student diversity, new educators are unprepared to teach the increasing CLD population (Zhang-Wu, 2021). The existing literature on CLD instruction can be divided into three themes: (a) perception of teaching ELLs, (b) preparation and motivation of educators to teach culturally diverse linguistic students (CLDS), and (c) acceptance of multi-linguistic education. Thus, the researchers sought to conduct a literature review evaluating studies that investigated the effects of educators' perception, preparation and motivation, and acceptance on the academic outcomes of students from CLD backgrounds.

Keywords: Culturally-Linguistically Diverse Backgrounds, Perceptions, Preparation, Motivation, Diversity Acceptance, Culturally Responsive Teaching, Diversity, and English language learners.

Culturally and Linguistically Responsive Teaching: A Literature Review

Background

An increasing number of students from CLD backgrounds make up United States classrooms across all academic grades (Mahalingappa et al., 2021; Zhang-Wu, 2021). Despite this growth in numbers, educators generally instruct students using a monolingual curriculum (Mahalingappa et al., 2021). To successfully teach CLD students, educators must understand the theories and beliefs contributing to inequity, reflect on their ideas and biases, and learn strategies to support culturally and linguistically responsive teaching (CLRT) (Mikkonen et al., 2019). Inaccurate assumptions regarding teaching ELL can impact an educator's ability to teach. These assumptions and lack of educator preparation contribute to overdiagnosis or underdiagnosis of students with disabilities who would benefit from a special education program or ELL students who would benefit from a program aimed to increase English proficiency, such as *English Speakers of Other Languages* (ESOL) (Rizzuto, 2017). Linguists argue that with proper instruction, bilingual learners develop linguistic skills in both languages while improving academically (Wiley & García, 2016). Bilingual inclusion opportunities should focus on principles of English syntax, which can support dual-language learners (Rizzuto, 2017).

Problem Statement

For teaching practices to be effective, educators must assist culturally and linguistically diverse students (CLDS) to achieve academic success, develop cultural aptitude, and encourage reflection on social structures (Ladson-Billings, 1995). CLRT is when teachers are sensitive to students' cultural backgrounds and perspectives (Gay, 2010). However, educators' cultural assumptions and preconceptions can influence their ability to instruct CLDS. Therefore, educators must take a culturally humble approach and recognize one's limited knowledge about the cultures and beliefs of others (Faltis & Valdés, 2016). An educator who brings a culturally humble approach is committed to self-evaluating and self-critique their culture/ beliefs and those of others (Pohan & Aguilar, 2001; Yeager & Bauer-Wu, 2013). Through this self-evaluation process, educators are more likely to seek preparation opportunities to strengthen weak areas. Adequate preparation can also support the educators' acceptance and motivation of teaching a multicultural and multilingual population (Darling-Hammond & McLaughlin, 1995).

Conceptual Framework

The literature review on teaching CLDS revolves around student success, educators' perceptions, and readiness to instruct CLDS. Theoretical and conceptual assumptions regarding the challenges of inequitable power structures in communities between CLDS and educators can be explained through the lens of borderlands theory. The borderland theory originates from Gloria Anzaldúa's borderland/La Frontera: *The New Mestiza*. Anzaldúa's work describes how individuals from diverse backgrounds fluctuate between two discrete worlds, participating in both and not belonging to either world (Anzaldúa, 1987). A sense of belonging leads to student success, as described by Tinto. Tinto's model of integration and congruency, integration and adaptation of diverse students into a community or culture, affects their success and sense of belonging (Tinto, 1975). Tinto categorizes background characteristics of social-economic status, educational background, gender, ethnicity, and age into two categories: 1) the disposition of individuals' intention and commitment, and 2) the nature of individuals' interactional experiences with the institution (adjustment, difficulty, congruence, and isolation) (Tinto, 1989). Gloria Anzaldúa and Tinto's model's borderland work influenced Elisa Abes's theory of Borderlands and belonging (Abes, 2009). Abes developed theoretical borderlands to address power structures in student development. Abes's borderland framework stems from a constructivist teaching model where learners gather information and build on personal experience (Joyce et al., 2015). Partnering borderlands and constructivism complement this research, as both theories have similar views on acquiring knowledge and the role previous experience plays. Students' success and teachers' perceptions of CLDS will be viewed through the lens of Abes's theoretical borderland and constructivism.

Purpose of the Literature Review

Although a significant component of classroom diversity focuses on ELL students, educators must also focus on the cultural and linguistic factors when teaching CLDS. Educators should incorporate CLRT (Smith & Downes, 2023), following a framework, such as Abes's borderline framework, as a constructivist teaching model to address these cultural and linguistic factors. A culturally and linguistically responsive approach can support the relationship between the educator and student by bringing awareness of the student's cultural and linguistic differences that may interfere with academic learning. Many educators do not incorporate CLRT in their classroom setting. Those educators who incorporate CLRT may not apply these practices

successfully. Thus, the researchers found a need to evaluate current studies that addressed the educators' perceptions, preparation and motivation, and bilingual training related to CLRT.

Methodology

Eligibility Criteria

Education peer-reviewed journals were evaluated for this literature review. Specific inclusion and exclusion criteria were utilized to select those studies that best ascertained the review's objectives. Studies published within the previous five years in English and with a completely accessible article were included. Publications chosen included both CLD students. Florida International University's (FIU) library services, which included the Education Resources Information Center (ERIC) and Google Scholar, were employed to access the research studies through journal databases.

Search Strategy

Specific key phrases were incorporated to facilitate the search. Only peer-reviewed studies published in English were included to guarantee evaluation of the most relevant studies. Keywords were chosen based on the clinical themes. The key phrases *preparing educators to teach culturally and linguistically diverse students* were used to search for articles published between 2017 and 2022 that were available through the Google Scholar database. Sixteen articles were found; however, only two were research studies. The subsequent search used the applicable Boolean operators, *preparing educators to teach culturally and linguistically diverse students.* This key phrase was entered in the FIU Library database, specifically ERIC and Google Scholar, for the same publication time frame as the first search. In this second search, two research studies were found. In the last search, additional key phrases were included*: teachers' preparation in teaching multilingual, multicultura*l, and *culturally and linguistically diverse students* without a year restriction*.* This phrase was entered into the FIU library without a publication year restriction; 1,144 articles were identified. After reviewing these articles at the title level, 12 additional studies were found. One article out of this latter group was removed since it described teaching English in a different country without addressing the themes of this literature review. Thus, this literature review included 15 research studies in the three combined searches that described the significance of perceptions, preparation/ motivation, or bilingual training in CLRT; see Figure 1: PRISMA: Publications Ranging between 2017 and 2022. In 2023, a fourth search was conducted to identify the most current research on the subject matter by entering the same two key phrases into the Google Scholar database. For the key phrase, *preparing educators to teach culturally and linguistically diverse students,* eight out of 14,600 articles were yielded. At the title level, five were removed due to irrelevance. When entering the phrase "*teachers' preparation in teaching multilingual, multicultura*l, and *culturally and linguistically diverse students," five articles out of 5,340 were identified as meeting the* inclusion criteria for this review. Therefore, the searches in 2023 yielded an additional eight articles combined; see Figure 2: PRISMA: Publication in 2023.

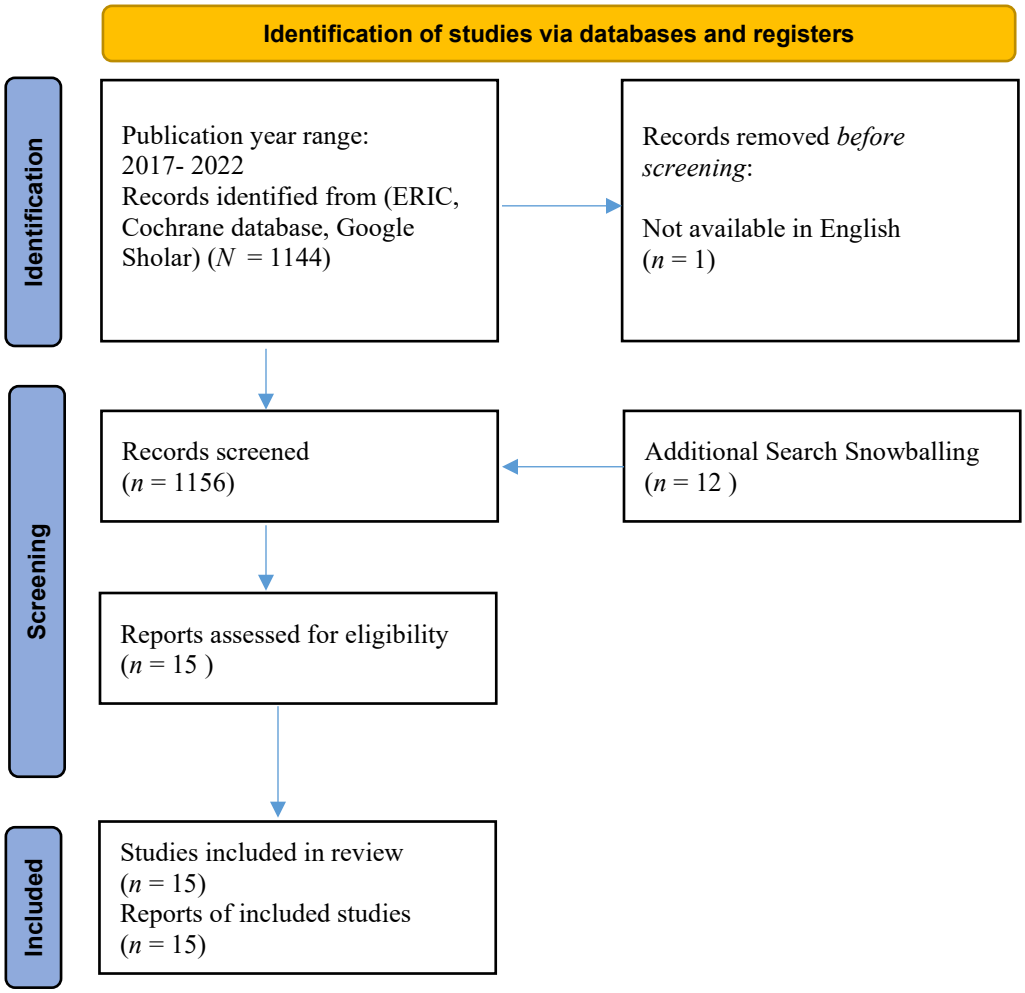

Figure 1: PRISMA: Publications Ranging between 2017 and 2022 (Page et al., 2021)

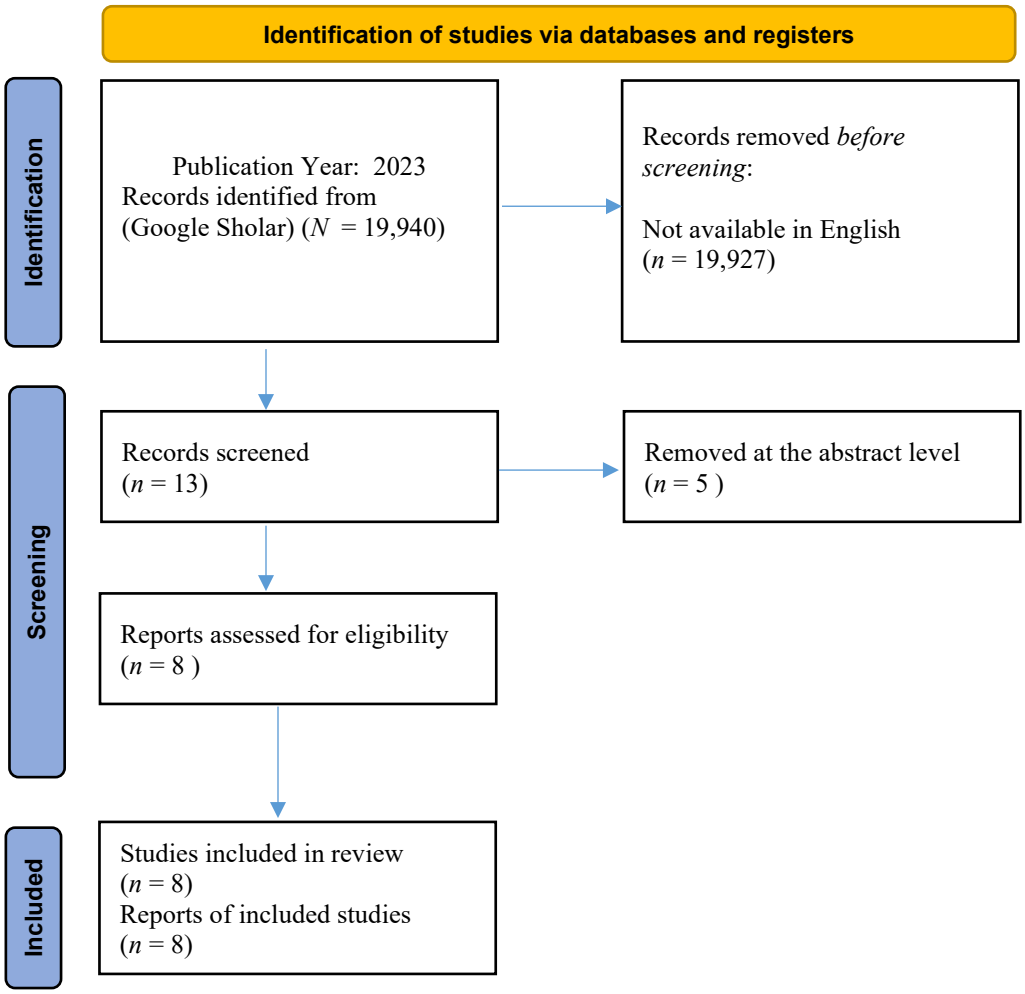

Figure 2: PRISMA: Publications in 2023
(Page et al., 2021)

Literature Review

Culture, cultural, and linguistic diversity are usually synonymous with English language learners. Therefore, much of the research can be categorized into three themes: (a) perception of teaching ELLs (Acquah & Szelei, 2018; Mahalingappa et al., 2021; Rizzuto, 2017; Senyshyn & Martinelli, 2020; Turner & Kim, 2005); (b) preparation and motivation of educators to teach CLDS (Djonko-Moore, 2022; Djonko-Moore & Traum, 2015; Mahalingappa et al., 2021; Salerno & Kibler, 2013; Senyshyn & Martinelli, 2020); and (c) acceptance of multi-linguistic education (Cajkler & Hall, 2012; Senyshyn & Martinelli, 2020; Turner & Kim, 2005).

Perceptions

Educators are challenged to leverage the culture and languages represented in their classrooms. Research findings demonstrated mixed results relating to the impact of an educator's perception (disposition, belief, values, attitudes) on the academic learning of CLDS (Mahalingappa et al., 2021). Research findings have indicated the importance of educators reflecting on their

assumptions and participating in improving the CLDS contextual framework in their teaching. CLRT initiatives may require modifications in the educators' practices and beliefs, and some educators may not feel comfortable with these changes.

Educators must be aware of the impact of their students' backgrounds on academic learning and develop strategies to alleviate challenges affecting their ability to succeed academically. Turner and Kim (2005) conducted an ethnographical case study evaluating the experiences of two educators working with CLDS using the perspective of a social constructivist theoretical framework of literacy education. These researchers aimed to identify the educators' perceptions in recognizing the impact of these diverse backgrounds and motivation levels in developing practices and strategies to work with this population. Findings showed that educators perceived the importance of working with CLDS students and favorably acknowledged their students' differences. Rizzuto (2017) also conducted a study to understand the educators' perceptions who work with early childhood ELLs. This researcher investigated how these perceptions affected pedagogical practices in literacy instruction. The study was guided by a transformative theoretical framework, which includes aspects of critical and social justice theories by evaluating the relationships that stem from the nature of power in a culture. Rizzuto employed a parallel mixed-methodology research design for this study. The data was collected from 10 early childhood Pre-K thru third-grade classrooms with CLDS. The researchers used Pohan and Aguilar's (2001) *Professional Beliefs about Diversity Likert Scale, questionnaires, and interviews to collect the data.* Qualitative and quantitative measures were used to evaluate early childhood teachers' perceptions of their pedagogy of teaching early childhood ELL. Findings indicated that participants acknowledged CLDS and accepted incorporating their cultural and linguistic backgrounds. However, they perceived that they were unprepared or unwilling to modify their instructions to support the academic needs of CLDS.

Acquah and Szelei (2018) also evaluated preservice educator perspectives on teaching CLDS using a descriptive case study. Their study aimed to identify the participants' learning experiences that differed in their personal and professional backgrounds regarding cultural diversity. Participants were recruited from 82 preservice educators enrolled in a multicultural education course. The inclusion criteria were as follows: the participants (a) identified modeling at three levels (no connection to experiences, no transferring of observations, and connection to future practice), (b) had diverse backgrounds, and (c) entered learning experiences in a journal. Two preservice teachers met the inclusion criteria from 52 out of 82 enrolled in the course. Results indicated that preservice teachers' perceptions were limited before the understanding and sensitivity of teaching CLDS before course instruction. Additionally, Senyshyn and Martinelli (2020) conducted a mixed-method case study research design to evaluate preservice teachers' cultural and linguistic diversity perspectives. Twenty-six participants were recruited to complete beginning and end-of-semester survey responses, mid-semester notes on student interactions, and reflections. Findings revealed that the participants' perceptions changed with increased understanding and knowledge of CLRT. The educators benefited from collaborative learning opportunities related to multicultural children's literature. These results indicated that few educators knew about this literature or how to implement it in their classrooms.

More recently, Mahalingappa et al. (2021) conducted a study to evaluate the effectiveness of educator preservice programs in (a) improving knowledge and perceptual outcomes about

linguistic and academic factors to address the needs of students from diverse backgrounds; (b) determining pedagogical preferences to meet linguistic and academic objectives; (c) identifying the programs' readiness to support the educators' and students' experiences. Twenty-four faculty members working in educator preservice programs were selected as participants from 11 institutions in the United States. The participants varied in ethnicity, speaking one or more languages. Participants were interviewed using a semi-structured format via ZOOM, an online conferencing platform. Findings demonstrated that the participants' perceptions were influenced by their beliefs about language, culture, and education. The results further indicated that although the participants were familiar with the term *culturally responsive edu*cation, unlike the term *linguistically responsive instruction, they could effectively describe the meaning of the latter term*. Some participants expressed that language and culture were interrelated. However, the definition of bilingualism/multilingualism differed amongst the participants. Few participants valued the importance of the language component of CLDS and not the correct use of syntax (grammar skills). Still, others were concerned about their students' writing skills. The educators' perceptions were generally favorable since they perceived that CLDS brought a positive experience into the classroom. However, some educators perceived the lack of participation of some students as a disagreement.

Educators' beliefs play a significant role in their pedagogy and how they will teach. A recent study by Tarigan and Stevani (2022) conducted a mixed-method research design to identify 27 English teachers' perceptions from six schools (three junior and three senior high schools) in Indonesia. The researchers aimed to identify the factors influencing educators' beliefs in teaching English grammar and their respective roles in teaching practices. The researchers used a mixed-method research design and collected the data using close-ended interviews and questionnaires. An implication of the findings revealed that the English teachers' perceptions of teaching grammar were favorable. Based on these results, educators' perceptions can influence their teaching practices, and participating in preservice preparation can positively impact these perceptions.

Preparation and Motivation

Perceptions of teaching CLDS can lead to developing a sense of motivation directly related to the amount and quality of preparation preservice teachers. Preservice teacher preparation, exposure, and fieldwork affect the instruction of CLDS (Djonko-Moore & Traum, 2015; Mahalingappa et al., 2021; Salerno & Kibler, 2013; Turner & Kim, 2005). Djonko-Moore and Traum examined the influence of early childhood educators' teacher preparation on the efficacy of culturally responsive teaching practices using surveys to obtain quantitative data. The researcher sent Likert surveys to 18 schools, recruiting 129 participants teaching early childhood classrooms in a single county in the southeastern United States, including suburban areas. Djonko-Moore and Traum assessed the connection between diversity coursework and culturally responsive teaching practices among early childhood teachers. The researchers concluded that diversity courses, methods courses, and field experiences increase preservice teachers' efficacy in teaching culturally and linguistically diverse children. Additionally, Djonko-Moore and Traum's research describes how education preparation exposure was a significant predictor of preservice teachers' use of culturally responsive teaching practices.

Educational preparation for teaching CLDS is not compulsory in many states; Salerno and Kibler (2013) argue that perhaps it should be. Salerno and Kibler used qualitative action research to examine the fieldwork of 65 different preservice instructors during their training, collecting, and analyzing their notes before graduation. The preservice teachers sampled came from a Southern University in the United States. Their findings suggest that preservice training experiences with diverse linguistic students should be required for state licensure (Salerno & Kibler, 2013).

Course and culturally responsive training also apply to higher learning. Mahalingappa and colleagues conducted a qualitative study using 24 semi-structured interviews with university faculty who teach linguistically diverse international students. The researchers stressed that despite various universities mainly using curricula and instruction based on monolingual norms, international student numbers are increasing, making up 5.5% of all university students in the United States (Mahalingappa et al., 2021). The analysis of the interviews yielded various themes. Based on the themes, the researchers emphasized the need for developing instructional skills and hands-on workshops, giving participants effective instructional practices for teaching CLDS.

Proper and sufficient preparation of preservice teachers in instructing ELL students will lead to increased motivation. Using two ELL instructors' case studies, Turner and Kim examined motivation and preparation. They advocated for teachers to create literacy learning communities for CLDS by acknowledging and affirming their cultural differences (Turner & Kim, 2005). Turner and Kim conducted two qualitative case studies to examine how teachers created multilingual literacy communities. The researchers advocate for instructors to forgo the traditional colorblind approach of ignoring cultural differences and advocate for bridge-building cultural communities (Turner & Kim, 2005). Embracing differences to create a culture of acceptance and understanding can create a culture of acceptance involving more than just preparation and motivation; it can include teachers thinking outside the norms of a monolingual American culture and accepting multilingual cultural norms.

Bilingual Training

Cultural understanding leads to the last and perhaps the most controversial theme of bilingual instruction and language acquisition. Language education in the United States could benefit from heteroglossic language practices due to the growing multilingual population (Wiley & García, 2016). Wiley and García suggest that federal policy should promote multilingualism in the United States instead of the current monolingual traditional policy (Wiley & García, 2016). Senyshyn and Martinelli (2020) surveyed 26 preservice teachers teaching children literature. They suggest incorporating multicultural children's literature teacher education programs to increase awareness and transform preservice teachers' perspectives toward diverse classrooms (Senyshyn & Martinelli, 2020).

Incorporating multicultural themes is an exciting concept mentioned by Cajkler and Hall (2012) in the European Journal of Teacher Education. Cajkler and Hall interviewed 26 primary teachers focusing on three themes: developments in pedagogy practice, collaboration with colleagues, and resolutions for change or development (Cajkler & Hall, 2012). They advocate for the use of bilingual teachers to be explored, the need to focus on understanding language acquisition and diversity, which could increase confidence levels immediately following training programs.

The idea of multilingual or bilingual benefits is unfamiliar and can be controversial in a traditionally monolingual country, such as the United States. Educators need to learn how languages, specifically additional languages, are learned; this knowledge can aid the instruction of CLDS (Rizzuto, 2017). Most preservice educators have not been exposed to linguistic information in preservice coursework, lacking knowledge of how students acquire and retain new languages (Bartolome, 2008; Rizzuto, 2017). Language acquisition and understanding of multi-lingual thought processes can be helpful for new teachers when instructing CLDS populations.

Limitations

The research studies reviewed demonstrated a broad range of theoretical perspectives on cultural and linguistic diversity in teacher preparation. Although over twenty theoretical models are related to cultural competence (Spitzberg & Changwon, 2009, as cited in Smolcic & Katunich, 2017), few studies reflected on theoretical frameworks relating to the perspectives, preservice preparation, motivation, and bilingualism acceptance simultaneously. There is a significant limitation in current studies evaluating cultural-linguistic competence in educators' instructional practices and the effects of preservice training. Additionally, few studies investigated the effects of preservice training on perceptual outcomes, such as attitudes, self-efficacy, and multicultural/ multilingual acceptance. Of the studies reviewed, none evaluated the themes of this paper using the borderline's theoretical framework. Thus, future studies should investigate the themes of this literature review using the lenses of the borderland theoretical framework on the effectiveness of preservice training for educators working with CLDS from a specific level of education, such as primary grades, middle and high school, and/ or higher education.

Implications

As time passes, schools will become more diverse. With this increase in diversity, educators will need to modify their instructional methods and curriculum. Most educators understand that CLRT is necessary for the successful academic learning of CLDS yet are faced with the challenge of incorporating culturally-linguistically diverse pedagogy within their classroom instruction (Rodriguez et al., 2023; Turner & Kim, 2005). These challenges result from the educators' lack of knowledge, self-efficacy, and attitudes toward CLRT in the classroom setting (Smith & Downes, 2023). Students from culturally-linguistically diverse backgrounds who do not have the support of their educators can face academic challenges.

Recommendations

To mitigate these challenges, schools should develop linguistically inclusive beliefs and practices (Burner & Carlsen, 2023) to support the academic learning of students with culturally-linguistically diverse backgrounds. Although many teachers have positive beliefs and attitudes about bilingualism, few incorporate culturally-linguistically responsive teachings in their classes (Burner & Carlsen, 2023). Some teachers feel unprepared to teach CLDS (Smith & Downes, 2023). Therefore, school administration should offer opportunities for educators to participate in preservice trainings on culturally- linguistically responsive pedagogy for classroom instruction. These trainings should be led by specialists in culturally and linguistically responsive practices,

such as those found in universities (Burner & Carlsen, 2023) and the community (Smith & Downes, 2023). Researchers de Jong and Gao (2023) recommended that these preservice trainings should be evaluated for efficacy to ensure that teachers are equipped to provide evidence-based teaching to CLDS.

Experts in culturally and linguistically responsive (CLR) practices can provide mentorship to teachers in several formats. They can guide these educators in incorporating pedagogical teaching, including language immersion experience and personal reflection (Smith & Downes, 2023). Mentors can assist in identifying potential CLR facilitators and barriers, such as a teacher's personal and professional experiences, self-efficacy skills, and attitudes toward cultural and linguistic diversity (Carbonneau et al., 2023). CLR mentors can guide teachers in encouraging families from culturally-linguistically diverse backgrounds to advocate for their child's academic learning, promoting student and family engagement (Carbonneau et al., 2023). Educators from culturally-linguistically diverse backgrounds can use their personal experiences to serve as mentors and guide their CLRT. Research has revealed the importance of these educators sharing personal anecdotes about their experience as second language learners to support multilingualism (Smith & Downes, 2023; Yoon, 2023). The mentorship and collaboration between CLR specialists and teachers, development and attendance of preservice trainings, and sharing of personal and professional experiences can support the transition from a theoretical standpoint into practice (Giles & Yazan, 2023; González, 2023), which is necessary for a CLDS to achieve academic learning.

Conclusion

Educators instructing English language learners can benefit from the themes presented in this literature review. The themes are all tied to one another, as preparation and perception can motivate preservice teachers to develop innovative teaching strategies, such as using culture and bilingual practices to help ELL students. These themes are interrelated as viewed through the lens of a constructivist borderlands framework. The themes paint a different picture of how preservice teachers can better instruct CLDS—understanding that CLDS learning benefits from their cultural experiences (González, 2023). Preservice teachers' course preparation and fieldwork in culturally diverse environments can help them understand how students' cultures can be used to understand information further. Abes and Anzaldúa stress the dichotomy of living between places and not belonging to either. The literature review can help preservice teachers guide CLDS to begin to understand how they can belong in the United States. This understanding of a teacher's personal and professional experience, knowledge, self-efficacy, and attitudes toward implementing CLRT can impact students' learning outcomes from culturally-linguistically diverse populations. These factors can be facilitators or barriers to the efficacy of the student's learning outcomes. Therefore, stakeholders must collaborate to improve preservice opportunities for teachers to succeed in CLRT. Research has indicated that teachers with culturally diverse linguistic preparation develop positive perceptions and are motivated to incorporate multilingual thought into their instruction and help CLDS succeed. This motivation can lead to student advocacy and family engagement within the school setting and their community, which ensures that students from culturally-linguistically diverse backgrounds can succeed academically and within their society (Carbonneau et al., 2023). Future studies should

identify existing beliefs and practices, preservice trainings (Burner & Carlsen, 2023), and evidence-based teaching practices.

References

Abes, E. S. (2009). Theoretical borderlands: Using multiple theoretical perspectives to challenge inequitable power structures in student development theory. *Journal of College Student Development 50*(2),141-156. https://10.1353/csd.0.0059.

Acquah, E. O., & Szelei, N. (2018). The potential of modeling culturally responsive teaching: Preservice teachers' learning experiences. *Teaching in Higher Education, 25*(20),157-173. https://doi.org/10.1080/13562517.2018.1547275

Anzaldúa, G. (1987). *Borderlands la frontera: The new mestiza.* (3rd ed., pp 38-41). Aunt Lute Books.

Bartolome, L. (2008). Understanding policy for equity in teaching and learning: A critical lens. *Language Arts, 85*(5), 376–381. http://faculty.www.umb.edu

Burner, T., & Carlsen, C. (2023). Teachers' multilingual beliefs and practices in English classrooms: A scoping review. *Review of Education*, *11*(2), e3407. https://doi.org/10.1002/rev3.3407

Cajkler, W., & Hall, B. (2012). Multilingual primary classrooms: An investigation of first-year teachers' learning and responsive teaching. *European Journal of Teacher Education, 35*(2), 213-228. https://doi.org/10.1080/02619768.2011.643402

Carbonneau, K. J., Ardasheva, Y., Lightner, L., Newcomer, S. N., Ernst-Slavit, G., Morrison, J. A., & Morrison, S. J. (2023). Moving beyond the classroom: Pre-and in-service teachers' self-efficacy for working with culturally and linguistically diverse students. *Teaching Education*, *34*(3), 247-264. https://doi.org/10.1080/10476210.2022.2104832

Cochran-Smith, M., Grudnoff, L., Orland-Barak, L., & Smith, K. (2020). Educating teacher educators: International perspectives. *The New Educator*, *16*(1), 5-24. https://doi.org/10.1080/1547688X.2019.1670309

Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan*, *76*(8), 597-604. https://www.researchgate.net

de Jong, E., & Gao, J. (2023). Preparing teacher candidates for bilingual practices: Toward a multilingual stance in mainstream teacher education. *International Journal of Bilingual Education and Bilingualism*, *26*(4), 472-482. https://doi.org/10.1080/13670050.2022.2119072

Djonko-Moore, C. M. (2022). Diversity education and early childhood teachers' motivation to remain in teaching: an exploration. *Journal of Early Childhood Teacher Education*, *43*(1), 35-53. https://doi.org/10.1080/10901027.2020.1806151

Djonko-Moore, C. M., & Traum, L. C. (2015). The influence of early childhood educators' teacher preparation and efficacy on culturally responsive teaching practices. *Teacher Education and Practice, 28*(1), 156-177. https://link.gale.com

Faltis, C. J., & Valdés, G. (2016). Preparing teachers for teaching in and advocating for linguistically diverse classrooms: A vade mecum for teacher educator. In D. H. Gitomer & C. A. Bell (Eds.), *Handbook of research on teaching* (5th ed., pp. 549-592). American Educational Research Association.

Gay, G. (2010). *Culturally responsive teaching: Theory, research, and practice* (2nd ed., pp. 89-140). Teachers College.

Giles, A., & Yazan, B. (2023). Constructing teacher identity in teacher collaboration: What does it mean to be a teacher of culturally and linguistically diverse English learners?. *Journal on Efficiency and Responsibility in Education and Science*, *16*(1), 36-45. https://doi.org/10.7160/eriesj.2023.160104

González, P. A. (2023). Early childhood teacher identity development for working with culturally and linguistically diverse students in chile. *Teaching and Teacher Education*, *131*, 104191. https://doi.org/10.1016/j.tate.2023.104191

Joyce, B., Weil, M., & Calhoun, E. (2015). *Models of teaching* (9th ed., p. 45). Pearson Publishing.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal, 32*(3), 465-491. https://doi.org/10.3102%2F00028312032003465

Mahalingappa, L., Kayi-Aydar, H., & Polat, N. (2021). Institutional and faculty readiness for teaching linguistically diverse international students in educator preparation programs in us universities. *TESOL Quarterly, 55*(4), 1247-1277. https://doi.org/10.1002/tesq.3083

Mikkonen, K., Koskinen, M., Koskinen, C., Koivula, M., Koskimäki, M., Lähteenmäki, M. L., Mäki-Hakola, H., Wallin, O., Sjögren, T., Salminen, L., Sormunen, M., Saaranen, T., Kuivila, H., & Kääriäinen, M. (2019). Qualitative study of social and healthcare educators' perceptions of their competence in education. *Health & Social Care in the Community*, *27*(6), 1555-1563. https://doi.org/10.1111/hsc.12827

Pohan, C. A., & Aguilar, T. E. (2001). Measuring educators' beliefs about diversity in personal and professional contexts. *American educational research journal*, *38*(1), 159-182. https://doi.org/10.3102%2F00028312038001159

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E. M., McGuinness, L. A., Stewart, L. A., Thomas, J., Tricco, A., C., Welch, V. A., Whiting P., & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *International journal of surgery*, *88*, 105906. https://doi.org/10.1016/j.ijsu.2021.105906

Rizzuto, K. C. (2017). Teachers' perceptions of ell students: Do their attitudes shape their instruction?. *The Teacher Educator*, *52*(3), 182-202. https://doi.org/10.1080/08878730.2017.1296912

Rodriguez, D., Omidire, M. F., & Anyosa, M. S. (2023). Pedagogical multicultural communities in teacher preparation. *International Education Journal: Comparative Perspectives*, *22*(1), 58-73. https://openjournals.library.sydney.edu.au/IEJ/article/view/17147

Salerno, A., & Kibler, A. (2013). Before they teach: How preservice teachers plan for linguistically diverse students. *Teacher Education Quarterly*, *40*(4), 5-26. https://www.jstor.org/stable/10.2307/teaceducquar.40.4.5

Senyshyn, R., & Martinelli, A. (2020). Learning to support and sustain cultural (and linguistic) diversity: Perspectives of preservice teachers. *Journal for Multicultural Education*, *15*(1), 20-37. https://www.emerald.com/insight/2053-535X.htm

Smith, J., & Downes, L. (2023). Implications for initial teacher education (ite) programs in preparing mainstream teachers for culturally and linguistically diverse classrooms. *TESOL in Context*, *32*(1), 87-108. https://search.informit.org/doi/abs/10.3316/informit.457428090634993

Smolcic, E., & Katunich, J. (2017). Teachers crossing borders: A review of the research into cultural immersion field experience for teachers. *Teaching and Teacher Education*, *62*, 47-59. https://www.sciencedirect.com

Tarigan, K. E., & Stevani, M. (2022). English teachers' beliefs in teaching english grammar to improve students' speaking skills. *Journal of English Language and Education*, *7*(1), 130-139. https://jele.or.id/index.php/jele/article/view/236

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Education Research*, 45, 89-125. https://doi.org/10.3102%2F00346543045001089

Tinto, V. (1989). Stages of student departure: Reflections on the longitudinal character of students leaving. *Journal of Higher Education*, 59, 438-455. https://doi.org/10.1080/00221546.1988.11780199

Turner, J. D., & Kim, Y. (2005). Learning about building literacy communities in multicultural and multilingual classrooms from effective elementary teachers. *Literacy, Teaching, and Learning, 10*(1), 21-41. https://files.eric.ed.gov/fulltext/EJ966162.pdf

Wiley, T. G., & García, O. (2016). Language policy and planning in language education: Legacies, consequences, and possibilities. *The Modern Language Journal*, *100*(S1), 48-63. https://doi.org/10.1111/modl.12303

Yeager, K. A., & Bauer-Wu, S. (2013). Cultural humility: Essential foundation for clinical researchers. *Applied Nursing Research,* 26(4), 251-256. https://www.ncbi.nlm.nih.gov

Yoon, B. (2023). Research synthesis on culturally and linguistically responsive teaching for multilingual learners. *Education Sciences*, *13*(6), 557. https://doi.org/10.3390/educsci13060557

Zhang-Wu, Q. (2021). Preparing monolingual teachers of multilingual students: Strategies that work. In U. Lanvers, A. S. Thompson, & M. East (Eds.), *Language learning in anglophone countries* (pp. 463–484). https://doi.org/10.1007/978-3-030-56654-8_23

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Reading Comprehension Instruction for Students with Autism Spectrum Disorder: A Review of the Literature from 2008 to 2020

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Abstract

Due to constructs as theoretical explanations (Theory of Mind, Weak Central Coherence, Executive Functioning), reading comprehension has been identified as a notable deficit for students with Autism Spectrum Disorder (ASD). The purpose of this literature review is: (1) to examine, summarize, and analyze the existing published literature on reading comprehension instruction for students with ASD between 2008-2020 with an emphasis on evidence-based practices, (2) to examine the potential influences of the above three constructs, and (3) to provide teachers evidence-based practices that might enhance the reading comprehension skills of students with ASD participating in the general education curriculum. Of the selected twenty nine articles (Research-to-Practice and Empirical), twenty-eight articles examined at least one or more evidence-based strategies as described by Wong et al., (2015) and Steinbrenner et al., (2020). Implications for future research and practice are briefly discussed.

Keywords: autism literature review, autism spectrum disorders (ASD), cognitive factors, reading comprehension literature review.

Reading Comprehension Instruction for Students with Autism Spectrum Disorder: A Review of the Literature from 2008 to 2020

Autism Spectrum Disorder (ASD) is a neurodevelopmental disability characterized by pervasive social-communication deficits and restricted, repetitive patterns of behavior (American Psychiatric Association, 2013). According to the Center for Disease Control and Prevention (CDC, 2023), 1 in 36 children aged 8 years old in the United States are impacted by ASD. Almost half of individuals identified with ASD demonstrate average to above average intellectual ability (CDC, 2023). However, the profound reading comprehension deficits commonly observed in this rapidly growing population of students imposes a concerning barrier to their academic success beginning in the primary school years (Brown et al., 2013; Chiang & Lin, 2007; Nation et al., 2006; Ricketts et al., 2013).

In the related literature, three theoretical cognitive constructs are implicated in the pervasiveness of reading comprehension challenges for a significant portion of the ASD population participating in the general education curriculum. (*Theory of Mind* [ToM], *Weak Central Coherence* [WCC], *Executive Functioning* [EF] (Chiang & Lin, 2007). Theory of Mind (ToM) refers to the inability to understand the point of view or perspective of another (Frith, 2012; San

José Cáceres et al., 2014). From a ToM perspective, students with ASD may find it difficult to understand a character's point of view or understand that the author may have a different perspective from their own. Weak Central Coherence (WCC) refers to the inability to conceptualize details into a main idea (Booth & Happé, 2011; Frith, 2012; Williamson et al., 2012). Students with ASD who also demonstrate WCC may have difficulty summarizing or identifying the main idea of an event (Happe & Frith, 2006; May et al., 2013). Executive Functioning (EF) deficits are defined as the inability to plan, organize, or monitor progress to achieve an objective (Carnahan et al., 2011; Ozonoff et al., 1991). Students with ASD may exhibit EF deficits as they attempt to create sequences of events, access and make connections to prior knowledge, and create mental images of the text (Carnahan et al., 2011).

According to the *Simple View of Reading*, reading comprehension is said to be the product of one's ability to (1) decode written text; and (2) comprehend spoken language with equal levels of proficiency (Gough & Tunmer, 1986). Given this broadly accepted conceptualization and the intricate nature and characteristics of ASD, it would be beneficial for teachers to have the fundamental knowledge and understanding of the various cognitive profiles or constructs of their students, the existing recommended evidence-based practices (NPDC, 2017; Steinbrenner et al., 2020; Wong et al., 2015), and the most frequently used evidence-based practices in order for them to assist students with ASD in general education classrooms develop reading comprehension skills more effectively.

Evidence-Based Practices

The National Professional Development Center on Autism Spectrum Disorder (NPDC) was funded by the Office of Special Education Programs in the US Department of Education from 2007-2017. The exceptional work of the NPDC was accomplished at the University of North Carolina at Chapel Hill, the University of Wisconsin at Madison, the MIND Institute, and the University of California-Davis. The focus of the NPDC was to promote the use of evidence-based practices (EBPs) (See definition of EBPs in the following section after Table 1) for individuals with ASD, birth to 22 years old. Through the work of the above four institutions and the collaborative efforts from state and local levels, the NPDC has provided free professional resources for researchers and practitioners, such as the Autism Focused Intervention Resources and Modules (AFIRM). This type of resource provides details on how to plan, implement, and monitor each of the identified evidence-based practices with fidelity. See Table 1 for a brief description of the NPDC, the National Clearing House on Autism Evidence and Practice (NCAEP), and the AFIRM.

Table 1

Pertinent Resources of Evidence-Based Modules for Researchers, Teachers, Therapists, and Other Professionals

Resource	Purpose/Description	Website
The National Professional Development Center on Autism Spectrum Disorder (NPDC)	To provide pertinent resources and promote the use of evidence-based practices (EBPs) for students or individuals with Autism Spectrum	For additional information, visit: https://autismpdc.fpg.unc.edu/

	Disorder (ASD), birth to 22 years of age.	
The National Clearing House on Autism Evidence & Practice (NCAEP)	To continue to conduct and report systematic reviews of the existing intervention literature for students or individuals with ASD from the original work of the NPDC which includes research published up to 2011.	For additional information, visit https://ncaep.fpg.unc.edu/
The Autism Focused Intervention Resources and Modules (AFIRM)	AFIRM modules (1.5 -3 hours duration to complete each module) of the identified 27 EBPs are designed to assist users with the detailed planning, using, and monitoring each of the 27 EBPs with students or individuals with ASD from birth to 22 years of age.	For additional information, visit: https://afirm.fpg.unc.edu/

As part of the collaborative NPDC team of researchers, Wong et al., (2015) and Steinbrenner et al., (2020) examined the rigor and outcomes of reported studies to determine the level of empirical support for instructional methods delivered to students with ASD (National Professional Development Center on ASD, 2017). As a result, 27 evidenced based practices were identified and described by the first group of authors (Wong et al., 2015) and later expanded and/or recategorized into 28 recommended practices by the subsequent group of authors (Steinbrenner et al., 2020). (See Wong et al., (2015) and Steinbrenner et al., (2020) for detailed descriptions of each of the identified practices). Both groups of the above researchers have established that a practice will be considered evidence-based when it is supported by: (a) two high quality experimental or quasi-experimental design studies conducted by at least two distinct research groups, or (b) five high quality single case design studies conducted by three different research groups with a total of 20 participants across studies, or (c) a combination of research designs of at least one high quality experimental/quasi-experimental design, three high quality single case designs, and conducted by more than one researcher or research group. It is worth noting that the above criteria are closely aligned with other established criteria by other organizations (Chambless & Hollon, 1998; Kratochwill & Sheroff, 2002; Odom et al., 2004).

As a result of these reports (Steinbrenner et al., 2020; Wong et al., 2015), classroom teachers, therapists, specialists, and researchers could make more informed choices on the instructional methods and interventions selected for students with ASD. For the current study or comprehensive review, all research-to-practice and empirical articles published from 2008-2020 were examined to determine the use of evidenced-based practices, as defined by both Wong et al. (2015) and Steinbrenner et al. (2020) in the provision of reading comprehension instruction for students with ASD participating in the general education curriculum.

Rationale

Federal mandates require all students (including students with ASD and other exceptionalities) to be taught to read based on reading research that focuses on the five strands of effective reading instruction: (a) phonemic awareness, (b) phonics, (c) vocabulary development, (d) fluency, and (e) reading comprehension (National Reading Panel, 2012; Whalon et al., 2009). As discussed earlier, due to the proliferation of students diagnosed with ASD during the past decade and the pressing need to enhance reading comprehension skills for this student population, the purpose of this review is: (a) to examine, summarize, and analyze the existing literature on reading comprehension instruction for these students (with an emphasis on evidence-based practices) published in peer reviewed articles (both research-to-practice and empirical) between 2008-2020, (b) to examine the potential influences of the three theoretical constructs (ToM, WCC, and EF), and (c) to provide classroom teachers with evidence-based reading comprehension practices for students with ASD that may lead to improvements in their reading comprehension skills (i.e., rather than only examining the various established quality indicators in empirical studies similar to other existing literature reviews).

To date, there has not been sufficient evidence that all EBPs in the Wong et al. (2015) or the Steinbrenner et al. (2020) reports would be beneficial for improving the reading comprehension skills of students with ASD. Therefore, the authors of this current review attempted to initiate such discussion by examining the following research questions. The twelve-year period (2008-2020) was selected due to the 10-year duration and the establishment of the aforementioned National Professional Development Center on Autism Spectrum Disorder (NPDC) from 2007-2017 and the most updated comprehensive review of 28 EBPs (Steinbrenner et al., 2020) since the last comprehensive review by Wong et al. (2015), which was funded by the Office of Special Education Programs in the U.S. Department of Education to promote the use of evidence-based practices to teach young children or individuals with ASD. Additionally, the last comprehensive review of reading comprehension practices without the focus on EBPs was done in 2007 (Chiang & Lin, 2007). Since the Chiang & Lin (2007) publication, six literature reviews focused on reading comprehension instruction for students with ASD has been published (El Zein, Solis, Vaughn, & McCulley, 2014; Fernandes et al., 2016; Finnegan & Mazin 2016; Knight & Sartini, 2015; Randi et al., 2010; Senokossoff, 2016). However, the extent to which researchers accentuated on the evidenced based practices described by Wong et al. (2015) or Steinbrenner et al. (2020) has not been sufficiently examined.

The following research questions guided this review:

Research Question 1. What reading comprehension instruction articles (Research-to-Practice and Empirical) for students with ASD were published between 2008-2020?

Research Question 2. Are there any published articles (Research-to-Practice and Empirical) that focused on the three constructs (ToM, WCC, and EF) and their potential influence on students with ASD's ability to comprehend text?

Research Question 3. Are there any published articles (Research-to-Practice and Empirical) that focused on the use of evidence-based practices to teach reading comprehension skills for students with ASD?

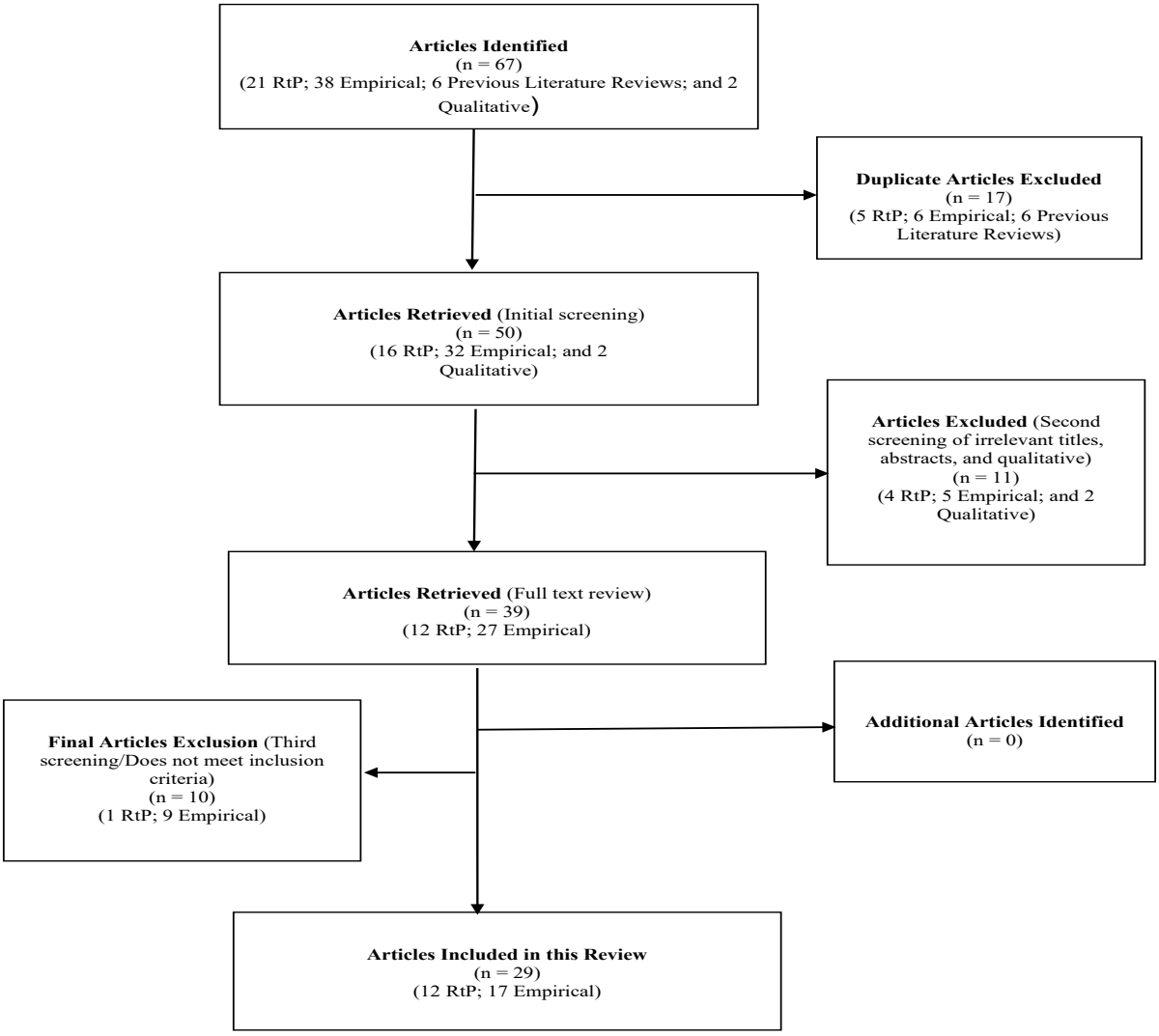
Research Question 4. Are there preferred, frequent, or suggested reading comprehension strategies that classroom teachers might consider implementing to ameliorate the existing deficits in reading comprehension of these students with ASD?

Methodology

The consolidated methodology for this review includes two frameworks. First, an approach of sequential stages for conducting a systematic review of the literature was adopted by the authors (Davies & Crombie, 1998; National Health Service Dissemination, 2001; Tranfield et al., 2003). This thorough approach to literature reviews described by Transfield et al., (2003), provides authors a three-phased protocol: (1) Planning for the review (i.e., identification of need, preparation of a proposal, the development of review procedures), (2) Conducting the review (i.e., research identification, study selection, study quality assessment, data extraction/monitoring progress, data synthesis), and (3) Reporting and dissemination (i.e., report recommendations, getting evidence into practice) (Tranfield et al., 2003). Second, the authors used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for the data selection and extraction process (PRISMA, 2017; Spain et al., 2018). The PRISMA framework provides authors a minimum set of guidelines (i.e., a four-phase flow chart and a 29-item checklist) to increase the rigor of reporting in systematic reviews and meta-analyses (PRISMA, 2017). See Figure 1 for a flow chart depicting the incremental article selection and process (initial and subsequent screenings of the 29 qualifying articles) followed by the authors of this review based on the recommended PRISMA guidelines.

Figure 1

PRISMA Diagram



Search Criteria/Procedures and Selection of Published Articles

A systematic search of the following electronic databases was conducted: (a) University library electronic database SearchWISE, (b) Education Resource Information Center (ERIC), and (c) PsychINFO. The resulting literature was filtered using a combination of descriptors including *reading comprehension and autism; reading comprehension and ASD*; *reading comprehension instruction and ASD*; *reading comprehension instruction and autism*; *teaching reading comprehension and ASD*; and *teaching reading comprehension and autism*. Subsequently, the authors also examined the references cited in the resulting literature to identify additional articles pertinent to this comprehensive review.

Since some students with ASD demonstrate commensurate reading profiles with their typical peers up until the age of 8 (Nation et al., 2006; Whalon & Hart, 2011), participants up to 12 years of age were chosen to be the age range for this review of the literature. Further, we also know that reading abilities tend to develop beyond the age of 8 into the elementary school years.

Articles were included in this review when (a) peer-reviewed studies or articles (both research-to-practice and empirical) were published from 2008-2020, (b) study participants (empirical) or student sample/population (research-to-practice) were inclusive of students with ASD up to 12 years of age, and (c) peer-reviewed studies or articles (both research-to-practice and empirical) inclusive of reading comprehension instructional methods for students with ASD. Conversely, studies or articles (both research-to-practice and empirical) were excluded from this comprehensive review when (a) published prior to 2008, (b) sample/population did not identify participants or students with ASD up to 12 years of age, (c) content focused on general profile of readers with ASD without inclusion of instructional methods related to reading comprehension, (d) non-peer-reviewed publications, and (e) non-English publications.

Data Analysis

At the beginning stages (i.e., planning the review, conducting a review, and PRISMA article selection process), the authors developed a simple form for data extraction that included the title, publication information, purpose of the article or study (for both research-to-practice and empirical articles), population/sample, strategies used or methodology, brief analysis of the articles, findings, practical implications or researchers' recommendations, and conclusions. Every time an article was chosen, the completion of this form and thorough examination were completed by the authors and saved in an overall shared drive for subsequent or additional reviews. Next, the authors created and sorted all selected articles into three separate shared drives for all research-to-practice, empirical articles, and the previously published six literature reviews. Lastly, the authors took turns to examine or synthesize the results (research-to-practice and empirical studies) to determine the emphasis on reading comprehension instructional practices and common recommendations across articles.

Numerous searches and initial/periodic analyses were completed. The authors stored and re-examined all articles in the above three shared drives for: (a) the decision of acceptance or rejection based on the above inclusive and exclusive criteria, (b) the availability of the existing published articles on reading comprehension instruction for students with ASD from 2008-2020, (c) additional reviews on both the content and specific common themes and/or strategies that were used in each article or study (both research-to-practice and empirical), (d) the suggested or potential influences on reading comprehension by the three constructs as theoretical explanations (ToM, WCC, and EF), (e) the examination of whether or not the use of evidence-based practices for improving reading comprehension mentioned in published articles or studies, and (f) commonly used and/or suggested strategies by researchers to practitioners to improve reading comprehension skills for students with ASD.

Inter-rater Agreement and Screening Outcome

The formula for inter-rater agreement was based on the number of agreements divided by the total number of agreements plus disagreements multiplied by 100% of inter-rater agreements (Field, 2009; Salkind, 2009). The results of the calculations were 96%, 94%, and 97% of agreement between the authors for coding the overall descriptive findings for both research-to-practice and empirical articles on specific reading comprehension instruction for students with ASD. The authors communicated, discussed, and resolved a few minor disagreements regarding article selection. Next, the entire screening and analysis processes of articles between authors on reading comprehension instruction for this student population resulted in a total of 29 articles, 12

of which were research-to-practice articles and 17 of which were empirical studies. Lastly, the authors continued to collaborate during the last stage (stage 3 – reporting and dissemination) of manuscript preparation to disseminate and/or submit our various analyses, provide related discussions, and suggest recommendations for future inquiry and practices based on the above four research questions to a peer-reviewed journal in reading, teacher education, or special education.

Results

Research-to-Practice Articles from 2008-2020

Twelve research-to-practice articles met the criteria for this review (See Table 2). Although there was some notable variation across the articles regarding recommendations for effective reading comprehension instruction for learners with ASD, the following common themes were derived from this systematic review of the research-to-practice articles published between 2008-2020.

Table 2
Published Research-to-Practice Articles Identifying Reading Comprehension Instruction for Students with ASD from 2008-2020

Author(s)	Purpose of Article	Strategy/Practice/ Intervention	Description	Conclusion/Implications
Carnahan et al. (2011)	Provides framework that addresses theoretical constructs of students with ASD, the relationship to reading comprehension, and provides suggestions for supporting reading comprehension for students with ASD.	Systematic and balanced literacy instruction with consideration of Theory of Mind, Executive Functioning, and Weak Central Coherence.	A systematic and balanced literacy instruction approach contains daily instruction in reading, writing, and vocabulary.	Combining knowledge of cognitive processes of students with ASD, understanding how meaning is constructed, and providing balanced literacy instruction may improve reading comprehension skills of students with ASD.
Carnahan & Williamson (2016)	Describes evidence-based intervention for reading comprehension based on text structure.	Evidence-based systematic instruction of text structures (e.g., compare and contrast, cause and effect).	Systematic instruction of text structures involves three main steps: (a) decide what to teach, (b) systematize the instruction (design a visual schedule, task analysis based on text structures, and create a text structure guidebook), and (c)	Systematic instruction of text structures may increase reading comprehension skills of students with ASD.

			individualize the instruction.	
Constable et al. (2013)	Describes psychological theories that characterize ASD and how these impact students with ASD. Examines challenges within English Language Art Common Core State Standards for students with ASD.	Use of naturalistic interventions, peer-support, social stories, comic strip conversations, visual supports, and prompting to support students with ASD in meeting ELA Common Core State Standards.	Strategies to support speaking and listening in include naturalistic interventions and peer-support. Strategies to support reading included social stories and comic strip conversations. Strategies to support writing include visual supports and prompting.	Knowledge of the characteristics of ASD can assist teachers with understanding how the performance of students with ASD is impacted with regard to ELA Common Core State Standards.
Finnegan & Accardo (2018)	Outlines three research-based reading comprehension strategies and provides instructions for implementation to support children with ASD with understanding character perspective.	Graphic organizers, anaphoric cueing, and question-answer relationships.	Graphic organizers, such as character event maps and story maps, can provide visual support for story elements. Anaphoric cueing strategies can assist students with correctly connecting pronouns to character names and identities. Question-answer relationships can assist with building awareness regarding types of questions being asked and the strategies used to find answers as well as encourage readers to make inferences.	Graphic organizers, anaphoric cueing, and question-answer relationship strategies can be tailored to meet the needs of any reader. Repeated use of these strategies may increase comprehension in the areas of social competence and understanding character perspective.
Fleury (2015)	Provides suggestions to parents and caregivers for indirectly managing problem behaviors in order to increase participation in book reading by young children with ASD.	Four main ideas to support behavior and participation in booking reading: (a) develop appropriate reading space and routine, (b) improve child's behavior during reading, (c)	Developing approaches to support and improve appropriate reading space and routine, behavior during reading, reading behavior, and active	Embedding strategies to address challenging behaviors during early literacy development may assist children with ASD in developing foundational literacy skills.

		teach appropriate reading behavior, and (d) support active participation during shared reading.	participation during shared reading.	
Gately (2008)	Describes a variety of strategies to use with students with ASD to develop higher order reading comprehension skills.	Use of multiple reading comprehension strategies tailored to the cognitive processing styles of students with ASD.	Strategies include accessing background knowledge, picture walks, visual maps, think-alouds and reciprocal teaching, understanding text structure, goal structure mapping, emotional thermometers, and social stories.	Use of multiple reading comprehension strategies may improve reading comprehension of students with ASD.
Jiménez-Fernández (2015)	Describes one strategy to use with students with ASD for improving inference-making skills.	Detective Questions strategy.	Consists of the following steps: (1) help students understand the meaning of inference, (2) help students determine the difference between literal and inferential questions, and (3) show students how to look for clues.	The Detective Questions strategy may be effective in teaching students with ASD how to make inferences from texts and may support the development of reading comprehension skills.
Lanter & Watson (2008)	Discusses approaches and interventions for improving reading skills of students with ASD with a focus on Speech/Language Pathologists.	Describes three stages of reading development (emergent, conventional, and skills), and various approaches and interventions to use at each stage.	Approaches and interventions to use at the emergent, conventional, and skill reading stages.	Encouraging Speech Language Pathologists to include literacy skill development in service provision may also support oral language development. Adding another layer of literacy skill development may improve overall reading skills of students with ASD.
Nguyen et al. (2015)	Describes steps general education teachers can use to improve the reading comprehension skills of students with ASD.	A five-step process for improving reading comprehension skills with each step connected to cognitive factors or	The steps in the process are (1) accessing and building background knowledge, (2) providing visual	Simplified, easy-to-use steps for reading instruction may assist general education teachers with improving the reading comprehension skills of students with ASD.

		constructs as theoretical explanations (ToM, WCC, EF) of students with ASD.	supports, (3) forming connections (text-to-self, text-to-text, and text-to-world), (4) participate in consistent dialogue and discussion, and (5) summarize understanding.	
Whalon & Hart (2011)	Examines the potential of adapting a question-and-answer relationships (QAR) strategy drawn from National Reading Panel (NRP) recommendations to improve the reading comprehension skills of students with ASD.	Question generation instruction and adapted QAR strategy.	Steps to teach students how to create and respond to questions about the text as well as adapting the QAR strategy.	The adapted QAR strategy may support the improvement of reading comprehension skills as well as peer interaction skills of students with ASD.
Woolley (2016)	Describes a balanced framework for an intervention that promotes reading comprehension skills of high-functioning students with ASD.	Three level structure that incorporates language decoding and comprehension, and metacognitive techniques.	The three-level structure consists of surface-level processing (e.g., decoding and reading fluency), deep-level processing (e.g., comprehension of text), and metacognitive-level processing (e.g., setting reading goals and self-monitoring reading).	High-functioning students with ASD benefit from multiple strategy reading interventions. Reading interventions that focus on the three levels of processing may prove to better assist students with ASD in developing and improving reading comprehension skills.
Zimmer (2017)	Describes ways caregivers can support early literacy experiences for students with ASD by using various strategies embedded in shared storybook reading.	Reading comprehension strategies embedded into shared storybook reading.	Strategies embedded into shared storybook reading include using books that are interesting to students, setting the environment, using attention-getters to focus attention on new vocabulary, using	Using reading comprehension strategies embedded in reading activities provide more exposure to emergent reading skills and may improve overall reading skills.

	distinct types of questions and use wait time for responses, model responses, and provide feedback.

Incorporating Best Practices for General Education Literacy Instruction

All twelve research-to-practice articles emphasized the evidence base for literacy instruction that informs the teaching practices in general education classrooms for all learners (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010; National Reading Panel, 2000; What Works Clearing House, 2010) as the foundation for strategy selection for students with ASD (Carnahan et al., 2011; Carnahan & Williamson, 2016; Constable et al., 2013; Finnegan & Accardo, 2018; Fleury, 2015; Gately, 2008; Jimenez-Fernandez, 2015; Lanter & Watson 2008; Nguyen et al., 2015; Whalon & Hart, 2011; Woolley, 2016; Zimmer, 2015).

Furthermore, various articles suggested isolating and/or enhancing existing instructional practices to compensate for the cognitive profile or constructs (ToM, WCC, EF) and core deficits (i.e., social cognition and oral language) specific to learners with ASD including: (a) activating background knowledge, (b) think aloud procedures, (c) picture walks, (d) graphic organizers/visual cues, (e) self-monitoring checklists, (f) general metacognitive strategy instruction, (g) explicit strategy instruction, (h) anaphoric cuing and (i) Question and Answer Relationships (QAR) (Carnahan et al., 2011; Carnahan & Williamson, 2016; Constable et al., 2013; Finnegan & Accardo, 2018; Gately, 2008; Jimenez-Fernandez, 2015; Lanter & Watson 2008; Nguyen et al., 2015; Whalon & Hart, 2011; Woolley, 2016). Adapting established instructional practices for general learners by embedding compensatory strategies based on the learning profile of students with ASD was strongly emphasized in the research-to-practice literature included in this review.

Embedding Instruction and Supports in the Students' Natural Environment

Several articles discussed embedding strategies and supports into the natural environment to maximize learning for students with ASD. For example, these articles exemplified the significance of introducing visual supports (e.g., graphic organizers, visual maps, question prompts) to increase student participation, engagement, and performance in reading comprehension activities (Carnahan et al., 2011; Carnahan & Williamson, 2016; Finnegan & Accardo, 2018; Fleury 2015; Gately, 2008; Lanter & Watson 2008; Nguyen et al., 2015; Whalon & Hart, 2011; Woolley, 2016). Other articles described interventions appropriate for implementation by persons other than the primary teacher during existing daily routines facilitated by speech and language pathologists (Lanter & Watson 2008), peers (Whalon & Hart, 2011; Constable et al., 2013; Woolley, 2016), and parents (Fleury, 2015). Enhancing the familiar physical environments and social relationships to maximize learning for students with ASD was commonly conveyed in the recommendations in the above research-to-practice articles.

Differentiation Based on Individual Student Profiles

Although all the reviewed articles promoted awareness of the general learning profile and deficits unique to the ASD population, numerous articles discussed the importance of planning instruction based on the individualized needs of the student. Specifically, these articles recommended teachers take into consideration the student's special interests, cognitive and language ability to effectively scaffold instruction for each student **(**Carnahan et al., 2011; Carnahan & Williamson, 2016; Fleury**,** 2015; Gately, 2008; Woolley, 2016; Zimmer, 2015).

Empirical Studies from 2008-2020

A total of seventeen empirical studies specifically examining reading comprehension interventions for children with ASD up to 12 years of age were identified for the purpose of this review (See Table 3) (Alison et al., 2017; Armstrong & Hughes, 2012; Bailey et al., 2017; Bethune & Wood, 2013; Browder et al., 2017; El Zein, Solis, Lang, & Kim, 2014; El Zein et al., 2016; Howorth & Raimondi, 2019; Jackson & Hanline, 2020; Kim et al., 2018; Mucchetti, 2013; Spooner & Ahlgrim-Delzell, 2014; Spooner et al., 2015; Stringfield et al., 2011; Whalon & Hanline, 2008; Whalon et al., 2015; Whalon et al., 2016). From the seventeen reviewed articles, the following commonalities and/or themes emerged.

Table 3
Published Empirical Studies Identifying Reading Comprehension Instruction for Students with ASD from 2008-2020

Author(s)	Participants	Setting	Research Design	Results/Findings
Alison, et al. (2017)	Three male students with ASD aged 8-10 years who were also identified as English language learners (ELL).	All sessions occurred in self-contained classroom for students with ASD with the interventionist providing reading comprehension instruction throughout study.	Single-subject multiple probes across participants.	Use of shared story reading with e-texts and embedded prompts had an overall positive effect on vocabulary and reading comprehension development.
Armstrong & Hughes (2012)	Five male high-functioning students with ASD in the second grade.	All sessions (baseline and intervention) occurred at a school in a quiet area partially closed off by white cardboard.	Single subject intervention design using two interventions randomly presented to participants.	Storybook and computer interventions were equally effective in developing listening comprehension skills.
Bailey et al. (2017)	Eighteen boys and two girls with ASD aged-5-11 years of age.	All sessions took place at both the University and in the participant's home.	Pretest/posttest control group design	Use of a free computer-assisted literacy program revealed statistically significant gains in reading accuracy and reading comprehension skills.
Bethune & Wood (2013)	Three elementary age (8-10 years old) male students with ASD.	All sessions occurred within the classroom at student desks or	Delayed multiple baselines across participants.	Use of graphic organizers can increase accuracy when

		designated reading instruction table.		responding to interrogative questions about a text.
Browder et al. (2017)	Two boys and one girl (8-10 years old) with ASD.	All intervention sessions occurred in a self-contained classroom.	A single case, multiple probes across participants design was used.	Results showed the intervention was effective for teaching story element definitions, labeling of story element map on the iPad, and comprehension of story element questions.
El Zein et al. (2014)	One eight years old boy with ASD.	All sessions took place in the school counselor's office at a table with two chairs to avoid potential distractions.	An alternating treatments design was used.	Use of perseverative interest (PI) such as cars within reading routines may help the student with ASD to be more accurate in providing responses in reading comprehension questions and more detailed oral retelling.
El Zein et al. (2016)	Two nine-year-old boys and one ten-year-old boy with ASD.	All sessions took place in an assistive technology lab.	An alternating treatments design was used.	Findings showed that the teacher-directed reading instruction is more effective when compared to the iPad-assisted instruction on accuracy of responding on CBM probes and reading comprehension performance.
Howorth & Raimondi, (2019)	Three 11-year-old males with ASD	All sessions occurred in a middle school ELA resource classroom in an urban, low socio-economic city in the northeast.	Single-subject multiple-baseline across participants.	Use of digitally supported Thinking before, While, and After (TWA-SD) strategy increased overall quality and accuracy of oral retellings of main ideas and details as well as increased responses to general comprehension questions.
Jackson & Hanline, (2020)	Two 5-year-old males with ASD.	All sessions were conducted in one-to-one format in a suburban community in the Southeast. For one participant, sessions occurred in his mother's living room, and for other participant, sessions occurred in classroom at a therapy center or	Single-subject reversal (ABAB) design.	Use of RECALL increased participant ability to answer fact- and inference-based questions pertaining to science texts.

		in his mother's classroom.		
Kim et al. (2018).	Three male students with ASD aged 6, 7, and 8.	All sessions occurred in an empty classroom in an autism clinic in the Midwest of the United States.	Single subject multiple-baseline design across participants.	Use of shared reading strategies that include before, during, and after reading strategy components improved reading comprehension and engagement.
Mucchetti (2013)	Four elementary students (three males, one female) with ASD and limited verbal abilities.	All intervention sessions occurred within the classroom at a table and one-to-one with the teacher.	Multiple baseline design across participants and modified alternating treatment design.	All four participants showed increased story comprehension and engagement during treatment phases.
Spooner et al. (2014)	Four elementary-aged male students with ASD who were also non-verbal.	All sessions occurred in two self-contained special education classrooms.	Multiple baselines across participants.	Use of an iPad2 and systematic instruction improved reading comprehension and listening skills.
Spooner et al. (2015)	Five elementary-aged students with ASD (3 females, 2 males).	All sessions occurred in a teaching office adjacent to self-contained special education classrooms.	Multiple probes across participants (Gast & Ledford, 2014; Horner & Baer, 1978).	Use of iPad2 with systematic instruction improved listening comprehension skills.
Stringfield et al. (2011)	Three elementary-aged male students with high-functioning ASD.	All sessions occurred once daily in a self-contained classroom for 15 minutes during language arts.	Multiple baselines across participants (Gast & Ledford, 2010).	Use of graphic organizers (Story Map) was effective in improving reading comprehension skills.
Whalon & Hanline (2008)	Three elementary-aged male students with ASD.	All sessions occurred in a small room located outside of special education and general education classrooms.	Multiple baselines across participants.	Use of reciprocal question comprehension strategy administered in cooperative pairs was effective in improving frequency of questions and responses.
Whalon et al. (2015)	Four male children ages 3-5 with ASD.	All sessions occurred in a self-contained special education pre-school classroom or workroom for three days per week.	Multiple baselines across participants.	Use of RECALL (Whalon, Delano, & Hanline, 2013) was effective in increasing correct and spontaneous responses.
Whalon et al. (2016)	A 26-year-old mother and her 4-year-old son with ASD.	All sessions occurred in the home.	Repeated acquisition design (Butler, Brown & Woods, 2014).	Use of RECALL (Whalon, Delano, & Hanline, 2013) in the home by a parent increased correct responses to facts, inference, and open-ended questions.

Multi-Strategy Approach

Most empirical studies described interventions that incorporated multiple strategies that, when combined, were reported to promote reading comprehension performance (Alison et al., 2017; Armstrong & Hughes, 2012; Browder et al., 2017; El Zein et al., 2016; Jackson & Hanline, 2020; Mucchetti, 2013; Spooner et al., 2014; Spooner et al., 2015; Stringfield et al., 2011; Whalon et al., 2015; Whalon et al., 2016; Whalon & Hanline, 2008). The interventions included a primary instructional method (e.g. shared reading, reciprocal questioning, graphic organizer) enhanced with additional strategies including: (a) visual cues or embedded visual prompts (Jackson & Hanline, 2020; Mucchetti, 2013; Spooner et al., 2014; Spooner et al., 2015; Whalon et al., 2015; Whalon & Hanline, 2008), (b) reinforcement (Alison et al., 2017; El Zein et al., 2016; Whalon et al., 2015, Whalon et al., 2016; Whalon & Hanline, 2008), (c) prompting hierarchy (Browder et al., 2017; Jackson & Hanline, 2020; Stringfield et al., 2011; Whalon et al., 2015, Whalon et al., 2016), or (d) a specific recommendation for a multi-strategy approach (Armstrong & Hughes, 2012). One article described a single strategy approach using a graphic organizer as the selected intervention (Bethune & Wood, 2013).

Incorporating Visual Stimuli

A preponderance of studies contained descriptions of visual stimuli to enhance the effect of the designed interventions. Visual stimuli incorporated in the reviewed empirical studies included: (a) visual enhancements/highlighted texts (Armstrong & Hughes, 2012; Howorth & Raimondi, 2019), (b) graphic organizers/story maps (Bethune & Wood, 2013; Browder et., 2017; El Zein et al., 2016; Jackson & Hanline, 2020; Stringfield et al., 2011), and (c) visual cue cards/embedded visual prompts (Kim et al., 2018; Mucchetti, 2013; Whalon et al.2015; Whalon et al., 2016; Whalon & Hanline, 2008). Referenced within the previous studies were a heightened focus on and preference for visual information as the rationale for embedding visual stimuli into intervention methodology.

Shared Reading Interventions

The use of shared reading interventions to support reading comprehension skills for students with ASD was discussed in several studies (Alison et al., 2017; Armstrong & Hughes, 2012; Jackson & Hanline, 2020; Kim et al., 2018; Mucchetti, 2013; Spooner et al., 2014; Whalon et al., 2015, Whalon et al., 2016). Consistent with the research-to-practice articles focused on adapted evidenced based practices for general literacy instruction and preserving the natural environment, these studies referenced the convincing evidence base for the effects of shared reading on early literacy development and the importance of embedding evidenced based practices into existing routines for young students with ASD.

Technology-Based Interventions

Technology based or enhanced interventions to support the engagement and comprehension skills of students with ASD was common across articles (Alison et al., 2017; Armstrong & Hughes, 2012, Bailey et al., 2017; Browder et al., 2017; El Zein et al., 2016; Howorth & Raimondi, 2019; Spooner et al., 2014; Spooner et al., 2015). Of these studies, three also noted the impact of technology enhanced instruction on subpopulations of participants including students with severe disabilities (Spooner et al., 2014; Spooner et al., 2015) and an English Language Learner (ELL) (Alison et al., 2017).

Potential Influence of the Three Known Theoretical Constructs (ToM, WCC, EF)

Of the twelve research-to-practice articles included in this review, five explicitly identified and described all three theoretical constructs (ToM, WCC, EF) associated with reading comprehension challenges in students with ASD (Carnahan et.al., 2011; Constable et al., 2013; Lanter & Watson, 2008; Nguyen et al., 2015; Woolley, 2016). Overall, ToM was most frequently described across the research-to-practice articles (seven of the twelve) (Carnahan et.al., 2011; Constable et al., 2013; Finnegan & Accardo, 2018; Gately, 2008; Lanter & Watson, 2008; Nguyen et al., 2015; Woolley, 2016); followed by EF (six out of twelve) (Carnahan & Williamson 2016; Carnahan et.al., 2011; Constable et al., 2013; Lanter & Watson, 2008; Nguyen et al., 2015; Woolley, 2016); and WCC with the fewest specific references (five out of twelve) (Carnahan et.al., 2011; Constable et al., 2013; Lanter & Watson, 2008; Nguyen et al., 2015; Woolley, 2016). Of the seventeen empirical articles reviewed, none specifically accentuated all three theoretical constructs or their combined impact on the comprehension abilities in student with ASD. However, EF was emphasized by the authors of one article (Springfield et al., 2011).

Although the level of description and the relative contribution of the three theoretical constructs varied between the research-to-practice articles discussed above, the combined impact of the cognitive profiles or constructs on reading comprehension proficiency of learners with ASD included impairments in the following skill areas: (a) identifying characters' emotions and motivations, recognizing differing points of view/perspectives and making predictions based on contextual cues (ToM), (b) discriminating salient details, summarizing story events, and identifying main idea (WCC), and (c) recalling events, generating ideas, integrating information, and self-monitoring for understanding (EF). Combined, this unique cognitive profile is recognized as preventing students with ASD from making inferences and accessing relevant background knowledge which impedes their ability to construct meaning from texts and achieve reading comprehension proficiency equivalent to their typically developing peers.

Research-to-Practice Articles from 2008-2020 with the Use of Evidence-Based Practices

The pervasive reading comprehension challenges ubiquitously observed in students with ASD necessitates quality professional development for teachers focused on the effective implementation of evidenced based practices. To improve academic achievement and outcomes for students with ASD, it is essential to bridge the research-to-practice gap and inform teachers on how to successfully implement effective interventions and instructional methods. All research-to-practice articles (peer-reviewed) were examined to determine what evidenced based practices (as defined by Wong et al., 2015) were recommended in the literature published from 2008-2020. Eleven of the twelve reviewed articles described evidence-based practices identified by Wong et al., (2015) and Steinbrenner et al., (2020) as components of effective reading comprehension practices for students with ASD (Carnahan et al., 2011; Carnahan & Williamson 2016; Constable et al., 2013; Finnegan & Accardo, 2018; Fleury, 2015; Gately 2008; Lanter & Watson 2008; Nguyen et al.2015; Whalon & Hart 2011; Woolley 2016; Zimmer, 2017) (See Table 4).

Of the above twelve research-to-practice articles, nine focused mainly on the use of *visual supports* (Carnahan et al., 2011; Carnahan & Williamson 2016; Finnegan & Accardo, 2018; Fleury 2015; Gately 2008; Lanter & Watson 2008; Nguyen et al., 2015; Whalon & Hart 2011; Woolley 2016), four on *modeling* (Nguyen et al.2015; Whalon & Hart 2011; Woolley 2016;

Zimmer, 2017), two on *parent implemented interventions* (Fleury, 2015; Zimmer, 2017), two on *social narratives* (Constable et al., 2013; Gately 2008), two on *peer –based instruction and intervention* (Whalon & Hart 2011; Woolley 2016), one on *prompting* (Zimmer, 2015), one on *reinforcement* (Fleury**,** 2015), one on *task analysis* (Carnahan & Williamson 2016), one on *technology aided instruction and intervention* (Lanter & Watson 2008). Overall, the authors of the twelve research-to-practice articles emphasized nine out of the 28 evidence-based practices described by Steinbrenner et al., (2020) and Wong et al., (2015), with some repetition of the same practice across multiple articles (See Table 4).

Empirical Studies from 2008-2020 with the Use of Evidence-Based Practices

Federal and state laws mandate the use of evidenced-based instructional practices and ensure all students, with and without disabilities, make adequate progress and achieve desired outcomes (*Every Student Succeeds Act,* 2015; *Individuals with Disabilities Education Act,* 2004). Furthermore, federal legislation mandates that students with disabilities have access to the least restrictive environment (LRE; *Individuals with Disabilities Education Act*, 2004) and thus, many more students with ASD are participating in general education classroom and engaging in the same curriculum as their typically developing peers. However, given the complex theoretical constructs (ToM, WCC, EF) and core deficits (social, communication, and behavior) associated with ASD, students with the diagnosis who demonstrate poor reading comprehension are at an increased risk for academic failure. Thus, it is imperative to identify reading comprehension instructional practices with strong empirical support to improve outcomes for this growing population of students. The following research articles were examined to determine what evidenced based practices (Steinbrenner et al., 2020; Wong et al., 2015) were selected for studies published in the literature from 2008-2020. All seventeen empirical studies discussed one or more evidence-based intervention strategies as described by Wong et al., (2015) and Steinbrenner et al., (2020) (See Table 4).

Of the seventeen empirical studies, eleven were on *visual supports* (Armstrong & Hughes, 2012; Bethune & Wood, 2013; Browder et al., 2017; El Zein et al., 2016; Jackson & Hanline, 2020; Kim et al., 2018; Mucchetti, 2013; Stringfield et al., 2011; Whalon & Hanline, 2008; Whalon et al., 2015; Whalon et al., 2016), ten involved *prompting* (Alison et al., 2017; Browder et al., 2017; Jackson & Hanline, 2020; Mucchetti, 2013; Spooner et al., 2014; Spooner et al., 2015; Stringfield et al., 2011; Whalon & Hanline, 2008; Whalon et al., 2015; Whalon et al., 2016), eight involved *technology aided instruction and intervention* (Alison et al., 2017; Armstrong & Hughes, 2012; Bailey et al., 2017; Browder et al., 2017; El Zein et al., 2016; Howorth & Raimondi, 2019; Spooner et al., 2014; Spooner et al., 2015), five emphasized *reinforcement* (Alison et al., 2017; Browder et al., 2017; El Zein, Solis, Lang, & Kim, 2014; El Zein et al., 2016; Whalon et al., 2015), two were on the use of *task analysis* (Spooner et al., 2014; Spooner et al., 2015), two involved *modeling* (Howorth & Raimondi, 2019; Whalon & Hanline, 2008), one was on the use of *peer-based instruction and intervention* (Whalon & Hanline, 2008), one focused on *parent implemented interventions* (Whalon et al., 2016), and one involved *time delay* (Spooner et al., 2014). In summary, the authors of the above empirical studies focused on nine out of the 28 evidence-based practices with some repetition of selected practices across articles (See Table 4)**.**

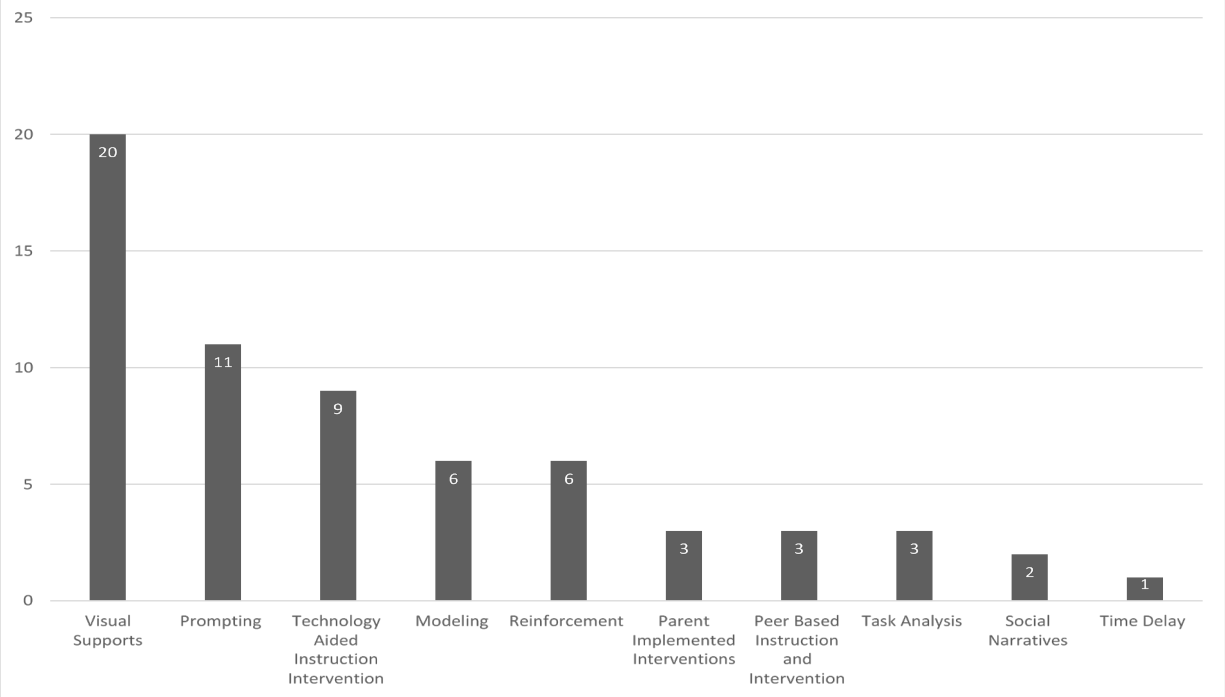
Table 4
Accentuated Evidenced Based Practices by Type of Article

Research-to-Practice Articles	**Accentuated Evidenced Based Practices**
Carnahan et al.,2011	Visual Supports
Carnahan & Williamson, 2016	Task Analysis, Visual Supports
Constable et al., 2013	Social Narratives
Finnegan & Accardo, 2018	Visual Supports
Fleury et al., 2013	Parent- Implemented Interventions, Reinforcement, Visual Supports
Gately, 2008	Social Narratives, Visual Supports
Jimenez-Fernandez, 2015	None Specifically Accentuated
Lanter & Watson 2008	Technology Aided Instruction and Intervention, Visual Supports
Nguyen et al., 2015	Modeling, Visual Supports,
Whalon & Hart, 2011	Modeling, Peer- Based Instruction and Intervention, Visual Supports
Woolley, 2016	Modeling, Peer- Based Instruction and Intervention, Visual Supports
Zimmer, 2015	Modeling, Prompting, Parent- Implemented Interventions
Empirical Studies	**Accentuated Evidenced Based Practices**
Alison et al., 2017	Prompting, Reinforcement, Technology Aided Instruction, and Intervention
Armstrong & Hughes, 2012	Technology Aided Instruction and Intervention, Visual Supports
Baily et.al., 2017	Technology Aided Instruction and Intervention
Bethune & Wood, 2013	Visual Supports
Browder et al., 2017	Prompting, Reinforcement, Technology Aided Instruction and Intervention, Visual Supports,
El Zein et al., 2014	Reinforcement
El Zein et al., 2016	Reinforcement, Technology Aided Instruction and Intervention, Visual Supports
Howorth & Raimondi, 2019	Modeling, Technology Aided Instruction and Intervention
Jackson & Hanline 2020	Prompting, Visual Supports
Kim et al., 2018	Visual Supports
Mucchetti, 2013	Prompting, Visual Supports
Spooner et al., 2014	Prompting, Task Analysis, Technology Aided Instruction/Intervention, Time Delay
Spooner et al., 2015	Prompting, Task Analysis, Technology Aided Instruction/Intervention
Stringfield et al., 2011	Prompting, Visual Supports
Whalon & Hanline, 2008	Modeling, Peer- Based Instruction and Intervention, Prompting, Visual Supports
Whalon et al., 2015	Prompting, Reinforcement, Visual Supports
Whalon et al., 2016	Parent-Implemented Interventions, Prompting, Visual Supports

Combined, the 29 identified articles (12 research-to-practice, 17 empirical studies) reviewed here, emphasized ten of the 28 evidenced-based practices as defined by Wong et al., (2015) and Steinbrenner et al. (2020) (See Figure 2). Nine of the ten practices were accentuated in both types of articles reviewed (research-to-practice and empirical studies). The use of time delay was the exception to this overlap, having only been identified in one of the empirical articles and none of the research-to-practice articles reviewed.

Figure 2.

Evidenced-Based Practices Accentuated Across the Twenty-Nine Articles



Discussion

Regarding the first research question on the availability of both empirical and research-to-practice articles on reading comprehension instruction for students with ASD between 2008-2020, twenty-nine published articles from 2008-2020 were examined and confirmed by the authors of this review based on the established criteria (12 research-to-practice, 17 empirical studies). From the twelve research-to-practice articles reviewed here, some common themes emerged that may be beneficial to the reading comprehension skill development of students with ASD such as incorporating best practices for general education literacy instruction, embedding instruction and supports in the student's natural environment, and differentiation-based on individual student profiles. The common themes found in seventeen empirical studies were multiple strategy approaches, incorporating visual stimuli, shared reading interventions, and technology-based interventions. In line with previous assertions regarding the reading comprehension acquisition process (Calkins et al., 2012), these articles suggest that a preponderance of researchers describe reading comprehension as a complex cognitive process

entailing a multi-strategy approach and consistent implementation of strategies in the classroom. Further, the above findings also suggest that when working with students with ASD, it is critical that teachers can identify and provide the appropriate learning environments and instruction that are tailored to the current skill levels and needs of these students.

Regarding the second research question on the existing focused articles on the three theoretical constructs (ToM, WCC, and EF) and its potential influence on the ability of students with ASD to comprehend text, only five of the twelve research-to-practice articles identified and characterized the three theoretical explanations (ToM, WCC, and EF) (Carnahan et.al., 2011; Constable et al., 2013; Lanter & Watson, 2008; Nguyen et al., 2015; Woolley, 2016). Of the seventeen empirical studies included in this review, none specifically described the combined impact of the three known constructs on the reading comprehension impairments of students with ASD; however, EF was specifically referenced in one of the seventeen articles (Stringfield et al, 2011).

Based on our examination of the research-to-practice articles discussed above, the consolidated impact of the above three cognitive profiles or constructs (ToM, WCC, and EF) on reading comprehension ability of students with ASD revealed significant difficulty with: (a) identify characters' emotions (ToM), (b) recognize other's point of view (ToM), (c) make predictions of the reading texts (ToM), (d) sequence and/or summarize story events (WCC), (e) identify main idea (WCC), (f) recall events (EF), (g) generate ideas (EF), (h) integrate information (EF), and (i) self-monitoring for understanding (EF).

Regarding the third research question on articles with the emphasis on the use of evidence-based practices to teach reading comprehension skills for students with ASD, 28 out of 29 (twelve research-to-practice articles and seventeen empirical studies) examined or described at least one or more evidenced-based strategies as described by Wong et al., (2015) and Steinbrenner et al., (2020). Jiménez-Fernández (2015) focused on a specific questioning strategy (Detective Questions) for the purpose of the study. Overall, the authors from the research-to-practice articles focused on nine of the 28 recommended evidence-based practices (Steinbrenner et al.2020, Wong et al., 2015).

Out of the seventeen identified empirical articles in this review, nine out of the 28 evidence-based practices (Steinbrenner et al.2020, Wong et al., 2015) were identified. Across the 29 articles, there was considerable overlap in the selection of evidenced based practices represented across the two types of articles reviewed for the purpose of this review (research-to-practice and empirical). One explanation for this may be the shared perceptions of researchers on the appropriateness and ease of implementation of some identified practices over others. Particularly in respect to the environment in which reading instruction is most likely to occur (general education classroom) and the level of training needed for practitioners to implement them with fidelity.

Due to the variation of skills and/or ability of students with ASD, these above findings suggest that additional empirical studies are needed in order to: (a) further validate the used EBPs as described above in this review, (b) investigate the potential impacts of the remaining evidence-based practices on reading comprehension of students with ASD (Steinbrenner et al., 2020;

Wong et al., 2015) that were not described in the included articles in this review (research-to-practice and empirical), (c) determine whether or not these previous findings (twelve research-to-practice articles and seventeen empirical studies included in this review) actual have any influence over practice (classroom or teachers' implementations) and future focused research on the use of EBPs for reading comprehension instruction of students with ASD, and (d) identify the potential barriers that might prevent the adoption of the suggested EBPs.

Lastly, to respond to the fourth research question regarding the preferred or suggested reading comprehension strategies that classroom teachers might consider implementing for students with ASD, of the 28 evidenced based practices, visual supports were most frequently incorporated into intervention studies and recommended as effective strategies for increasing reading comprehension for students with ASD. Although there were variations in the methods in which these practices were implemented and/or described, 20 (both research-to-practice and empirical articles) out of 29 identified articles referenced visual supports as a component of effective intervention (Armstrong & Hughes, 2012; Baily et al., 2017; Bethune & Wood, 2013; Browder et al., 2017; Carnahan & Williamson, 2016; Carnahan et al., 2011; El Zein et al., 2016; Fleury, 2015; Howorth & Raimondi, 2019; Jackson & Raimondi, 2019; Kim et al., 2018; Lanter & Watson, 2008; Mucchetti, 2013; Nguyen et al., 2015; Stringfield et al.,2011; Whalon & Hanline, 2008; Whalon & Hart, 2011; Whalon et al., 2015; Whalon et al., 2016; Woolley, 2016). Collectively, these articles conveyed a suggestion for teachers to begin to use graphic organizers and visual cuing procedures to compensate for the theoretical constructs (ToM, WCC, EF) known to contribute to reading comprehension challenges for students with ASD in their own classrooms.

The use of prompting was also a commonly employed strategy in the reviewed articles for teachers to consider. Eleven of the 29 articles referenced prompting as a required component for effective intervention (Alison et al., 2017; Bowder et al., 2017; Jackson & Hanline, 2020; Mucchetti, 2013; Spooner et al., 2014; Spooner et al., 2015; Stringfield et al. 2011; Whalon & Hanline, 2008; Whalon et al., 2015; Whalon et al., 2016; Zimmer, 2015). Notably, a least-to-most prompting procedure was favored by the interventionists. In addition, nine out of 29 articles emphasized the benefit of using technology-based instruction and intervention to enhance the effectiveness of instruction (Alison et al., 2017; Armstrong & Hughes, 2012; Baily et.al., 2017 ; Bowder et al., 2017; El Zein et al., 2016; Howorth & Raimondi, 2019; Lanter & Watson, 2008; Spooner et al., 2014; Spooner et al., 2014;) and six out of 29 articles emphasized modeling (Howorth & Raimondi, 2019; Nguyen et al., 2015; Whalon & Hart, 2011; Whalon & Hanline; 2008; Woolley, 2016; Zimmer, 2015) and six identified reinforcement (Alison et al., 2017; Browder et al., 2017; El Zein, Solis, Lang, & Kim, 2014; El Zein et al., 2016; Fleury et al., 2013; Whalon et al., 2015) as essential components of a multi-strategy approach. To a lesser extent, the use of parent-implemented interventions (Fleury et al., 2013;Whalon et al., 2016; Zimmer, 2015), peer-based instruction and intervention (Whalon & Hanline, 2008;Whalon & Hart 2011;Woolley, 2016) and task analysis were referenced in three articles (Carnahan & Williamson, 2016; Spooner et al., 2014; Spooner et al., 2015), while social narratives were referenced in two (Constable et al., 2013; Gately, 2008), while time delay was referenced in one empirical study (Spooner et al., 2014).

Limitations

The authors acknowledge several limitations within this review. First, our present findings might not illustrate the up-to-date existing data on reading comprehension instruction for students with ASD since we excluded non-English publications as part of our exclusionary criteria. Second, due to the chosen types of electronic databases, the authors of this review might have overlooked one or a few pertinent articles for the purpose of this review of the literature. Third, students with ASD vary in their abilities and strengths and often have a number of co-occurring conditions that impact learning. Thus, findings reported here cannot be generalized to all identified students with ASD across educational settings.

Implications for Future Inquiry and Classroom Practice

The current review extends the literature by summarizing the current evidence base (both research-to-practice and empirical studies) for reading comprehension instruction for students with ASD from 2008-2020. In addition, this review reports the extent to which the identified original 27 evidence-based practices described by Wong et al. (2015) or the most recent 28 evidence-based practices reviewed by Steinbrenner et al. (2020) are being used and effectively implemented to improve reading comprehension instruction and outcomes for this at-risk population of students.

Additional studies and future reviews of the literature are needed to: (a) further evaluate and validate the use of any of the 28 evidenced-based practices for reading comprehension instruction for students with ASD (particularly those evidence-based practices that were chosen, not chosen or used by the aforementioned researchers in this review of the literature and other future researchers), and (b) continue to determine the types and levels of empirical support for the evidence-based practices identified by Wong et al. (2015) and Steinbrenner et al. (2020) or NCAEP in isolation and as components of a comprehensive intervention package. Next, based on the initial findings of this current review (while waiting for additional data on the effectiveness of the suggested EBPs from future studies), classroom teachers of students with ASD should continue or begin to use the AFIRM modules from the NPDC (see Table 1 and Wong et al., 2015 or Steinbrenner et al., 2020) to implement the above recommended evidence-based practices (i.e., mainly visual supports, prompting, and technology-based instruction) during their weekly instructional planning and delivery. Further, it is pertinent for classroom teachers to take into consideration of the students' diagnoses, theoretical constructs (ToM, WCC, EF), and current acquired skill levels (language, overall academic, and social) during the process of selecting the appropriate evidence-based practices that should be tailored to their unique individualized needs of acquiring the necessary reading comprehension skills.

References

Alison, C., Root, J. R., Browder, D. M., & Wood, L. (2017). Technology-based shared story reading for students with autism who are english-language learners. *Journal of Special Education Technology, 32*(2), 91-101. https://doi.org/10.1177/0162643417690606

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC.

Armstrong, T., & Hughes, M. (2012). Exploring computer and storybook interventions for

children with high functioning autism. *International Journal of Special Education*, 27(3), 88-99.

Bailey, B., Arciuli, J., & Stancliffe, R. J. (2017). Effects of ABRACADABRA literacy instruction on children with autism spectrum disorder. *Journal of Educational Psychology*, *109*(2), 257-268. https://doi.org/10.1037/edu0000138

Bethune, K. S., & Wood, C. L. (2013). Effects of wh-question graphic organizers on reading comprehension skills of students with autism spectrum disorders. *Education and Training in Autism and Developmental Disabilities, 48*(2), 236-244.

Browder, D. M., Root, J. R., Wood, L., & Allison, C. (2017). Effects of a story-mapping procedure using the iPad on the comprehension of narrative texts by students with autism spectrum disorder. *Focus on Autism and Other Developmental Disabilities*, *32*(4), 243-255. https://doi.org/10.1177/1088357615611387

Brown, H., Oram-Cardy, J., & Johnson, A. (2013). A meta-analysis of the reading comprehension skills of individuals on the autism spectrum. *Journal of Autism and Developmental Disorders, 43*(4), 932–955. https://doi.org/10.1007/s10803-012-1638-1

Booth, R., & Happé, F. (2011). "Hunting with a knife and..fork": Examining central coherence in autism, attention deficit/hyperactivity disorder, and typical development with a linguistic task. *Journal of Experimental Child Psychology, 107*(4), 377-393. https://doi.org/10.1016/j.jecp.2010.06.003

Butler, C., Brown, J. A., & Woods, J. J. (2014). Teaching at-risk toddlers new vocabulary using interactive digital storybooks. Contemporary Issues in Communication Science and Disorders, 41, 155— 168. doi: 1092-5171/14/4102-01

Calkins, L., Ehrenworth, M., & Lehman, C. (2012). *Pathways to the common core: Accelerating achievement.* Portsmouth, NH: Heinemann.

Carnahan, C. R., & Williamson, P. (2016). Systematically teaching students with autism spectrum disorder about expository text structures. *Intervention in School and Clinic, 51*(5), 293-300. https://doi.org/10.1177/1053451215606695

Carnahan, C. R., Williamson, P. S., & Christman, J. (2011). Linking cognition and literacy in students with autism spectrum disorder. *TEACHING Exceptional Children, 43*(6), 54-62. https://doi.org/10.1177/004005991104300606

Center for Disease Control and Prevention. (2023). *Data and statistics on autism spectrum disorder*. https://www.cdc.gov/ncbddd/autism/index.html

Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology, 66,* 7-18. https://doi.org/10.1037/0022-006X.66.1.7

Chiang, H. M., & Lin, Y. H. (2007). Reading comprehension instruction for students with autism spectrum disorders: A review of the literature. *Focus on Autism and other developmental disabilities*, *22*(4), 259-267. https://doi.org/10.1177/10883576070220040801

National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for English language arts and literacy in history/social studies, science, and technical subjects*. Washington, DC: Authors.

Constable, S., Grossi, B., Moniz, A., & Ryan, L. (2013). Meeting the common core state standards for students with autism: The challenge for educators. *Teaching Exceptional Children, 45*(3), 6-13. https://10.1177/004005991304500301

Davies, H. T. O., & Crombie, I. K. (1998). Getting to grips with systematic reviews and meta-analyses. *Hospital Medicine, 59* (12), 955-958.

El Zein, F., Gevarter, C., Bryant, B., Son, S. H., Bryant, D., Kim, M., & Solis, M. (2016). A comparison between iPad-assisted and teacher-directed reading instruction for students with autism spectrum disorder (ASD). *Journal of Developmental and Physical Disabilities*, *28*(2), 195-215. https://doi.org/10.1007/s10882-015-9458-9

El Zein, F., Solis, M., Lang, R., & Kim, M. K. (2014). Embedding perseverative interest of a child with autism in text may result in improved reading comprehension: A pilot study. *Developmental neurorehabilitation*, *19*(3), 141-145. https://doi.org/10.3109/17518423.2014.915893

El Zein, F., Solis, M., Vaughn, S., & McCulley, L. (2014). Reading comprehension interventions for students with autism spectrum disorders: A synthesis of research. *Journal of Autism and Developmental Disorders, 44*(6), 1303-1322. https://doi.org/10.1007/s10803-013-1989-2

Every Student Succeeds Act, 20 U.S.C. § 6301 (2015). https://www.congress.gov/bill/114th-congress/senate-bill/1177

Fernandes, F. D. M., de La Higuera Amato, C. A., Cardoso, C., Navas, A. L. G. P., & Molini-Avejonas, D. R. (2016). Reading in autism spectrum disorders: A literature review. *Folia Phoniatrica et Logopaedica, 67*(4), 169-177. https://doi.org/10.1159/000442086

Field, A. (2009). *Discovering statistics using spss* (3rd ed.). Thousand Oaks, CA: Sage Publication, Inc.

Finnegan, E. G., & Accardo, A. L. (2018). Understanding character perspective: Strategies to support students with autism spectrum disorder. *The Reading Teacher*, *72*(1), 71-80. https://doi.org/10.1002/trtr.168

Finnegan, E., & Mazin, A. L. (2016). Strategies for increasing reading comprehension skills in students with autism spectrum disorder: A review of the literature. *Education & Treatment of Children, 39*(2), 187-219. doi:10.1353/etc.2016.0007

Fleury, V.P. (2015). Engaging children with autism in shared book reading: Strategies for parents. *Young Exceptional Children,* 18 (1), 3-16. https://doi.org/10.1177/1096250613505098

Frith, U. (2012). Why we need cognitive explanations of autism. *Quarterly Journal of Experimental Psychology*, *65*(11), 2073–2092. https://doi.org/10.1080/17470218.2012.697178

Gast, D. L., & Ledford, J. R. (2014). *Single case research methodology: Application in special education and behavioral sciences* (2nd ed.). New York, NY: Routledge.

Gast, D. L., & Ledford, J. (2010). Multiple baseline and multiple probe designs. In D. L. Gast (Ed.), *Single subject research methodology in behavioral sciences* (pp. 276–328). New York, NY: Routledge.

Gately, S. E. (2008). Facilitating reading comprehension for students on the autism spectrum. *TEACHING Exceptional Children, 40*(3), 40-45. https://doi.org/10.1177/004005990804000304

Happé, F., & Frith, U. (2006). The weak coherence account: Detail-focused cognitive style in autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *36*(1), 5–25. https://doi.org/10.1007/s10803-005-0039-0

Homer, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baselines. *Journal of Applied Behavior Analysis, 11,* 189-196.

Howorth, S. K., & Raimondi, S. (2019). Effects of TWA-supported digitally on comprehension

of students with autism spectrum disorder, level 1. *Journal of Special Education Technology*, *34*(3), 162-175. https://doi.org/10.1177%2F0162643418801808

Individuals with Disabilities Education Act, 20 U.S.C. §1400 (2004).

Jackson, E. M., & Hanline, M. F. (2020). Using a concept map with RECALL to increase the comprehension of science texts for children with autism. *Focus on Autism and Other Developmental Disabilities*, 35(2), 90-100. https://doi.org/10.1177/1096250620950244

Jiménez-Fernández, G. (2015). Detective questions: A strategy for improving inference-making in children with mild disabilities. *Intervention in School and Clinic, 51*(1), 45-50. https://doi.org/10.1177/1053451215577477

Kim, S. Y., Rispoli, M., Lory, C., Gregori, E., & Brodhead, M. T. (2018). The effects of a shared reading intervention on narrative story comprehension and task engagement of students with autism spectrum disorder. *Journal of autism and developmental disorders*, *48*(10), 3608-3622. https://doi.org/10.1007/s10803-018-3633-7

Knight, V. F., & Sartini, E. (2015). A comprehensive literature review of comprehension strategies in core content areas for students with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 45*(5), 1213-1229. https://doi.org/10.1007/s10803-014-2280-x

Kratochwill, T. R., & Sheroff, E. S. (2002). Evidence-based practice: Promoting evidence-based Interventions in school psychology. *School Psychology Review, 33,* 34-48. https://doi/abs/10.1080/02796015.2004.12086229

Lanter, E., & Watson, L. R. (2008). Promoting literacy in students with ASD: The basics for the SLP. *Language, Speech, and Hearing Services in Schools, 39*(1), 33. https://doi.org/10.1044/0161-1461(2008/004)

May, T., Rinehart, N., Wilding, J., & Cornish, K. (2013). The role of attention in the academic attainment of students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *43*(9), 2147–2158. https://doi.org/10.1007/s10803-013-1766-2

Mucchetti, C. A. (2013). Adapted shared reading at school for minimally verbal students with autism. *Autism, 17*(3), 358-372. https://doi.org/10.1177/1362361312470495

Nation, K., Clarke, P., Wright, B.J., & Williams, C. (2006). Patterns of reading ability in students with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *36*(7), 911–919. https://doi.org/10.1007/s10803-006-0130-1

National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for English language arts and literacy in history/social studies, science, and technical subjects*. Washington, DC: Authors.

National Health Service Center for Reviews and Dissemination (2001). Undertaking systematic reviews of research on effectiveness. CRD's Guidance for those Carrying Out or Commissioning Reviews. CRD Report Number 4 (2nd Edition). York.

National Professional Development Center on Autism Spectrum Disorders (2017). Retrieved from https://autismpdc.fpg.unc.edu/national-professional-development-center-autism-spectrum-disorder.

National Reading Panel (2000). *Report of the national reading panel: Teaching students to read* (No. 00-4769). Washington, DC: National Institute of Child Health and Human Development.

National Reading Panel (2012). National Reading Panel. Retrieved from www.nichd.nih.gov/research/supported/Pages/nrp.aspx/FAQ/faq.htm

Nguyen, N. N., Leytham, P., Schaefer Whitby, P., & Gelfer, J. I. (2015). Reading comprehension and autism in the primary general education classroom. *The Reading Teacher, 69*(1), 71-76. https://doi.org/10.1002/trtr.1367

Odom, S. L., Brantlinger, E., Gersten, R., Horner, R. D., Thompson, B., & Harris, K. (2004). *Quality indicators for research in special education and guidelines for evidence-based practices: Executive summary.* Arlington, VA: Council for Exceptional Children Division for Research.

Ozonoff, S., Pennington, B.F., & Rogers, S.J. (1991). Executive function deficits in high-functioning autistic individuals: Relationship to theory of mind. *Journal of Child Psychology and Psychiatry*, *32*(7), 1081–1105. https://doi.org/10.1111/j.1469-7610.1991.tb00351.x

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (2017). Retrieved from http://www.prisma-statement.org/

Randi, J., Newman, T., & Grigorenko, E. L. (2010). Teaching children with autism to read for meaning: Challenges and possibilities. *Journal of Autism and Developmental Disorders, 40*(7), 890-902. https://doi.org/10.1007/s10803-010-0938-6

Ricketts, J., Jones, C., Happé, F., & Charman, T. (2013). Reading comprehension in autism spectrum disorders: The role of oral language and social functioning. *Journal of Autism and Developmental Disorders, 43*(4), 807–816. https://doi.org/10.1007/s10803-012-1619-4

Salkind, N., J. (2009). *Exploring Research.* New Jersey: Pearson Educational, Inc.

San José Cáceres, A., Keren, N., Booth, R., & Happé, F. (2014). Assessing theory of mind nonverbally in those with intellectual disability and ASD: The penny hiding game. *Autism Research*, *7*(5), 608–616. https://doi.org/10.1002/aur.1405

Senokossoff, G. W. (2016). Developing reading comprehension skills in high-functioning children with autism spectrum disorder: A review of the research, 1990-2012. *Reading & Writing Quarterly, 32*(3), 223-246. https://doi/full/10.1080/10573569.2014.936574

Spooner, F., Ahlgrim-Delzell, L., Kemp-Inman, A., & Wood, L. A. (2014). Using an iPad2® with systematic instruction to teach shared stories for elementary-aged students with autism. *Research and Practice for Persons with Severe Disabilities, 39*(1), 30-46. https://doi.org/10.1177/1540796914534631

Spooner, F., Kemp-Inman, A., Ahlgrim-Delzell, L., Wood, L., & Ley Davis, L. (2015). Generalization of literacy skills through portable technology for students with severe disabilities. *Research and Practice for Persons with Severe Disabilities, 40*(1), 52-70. https://doi.org/10.1177/1540796915586190

Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). *Evidence-based practices for children, youth, and young adults with Autism*. The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, National Clearinghouse on Autism Evidence and Practice Review Team.

Stringfield, S. G., Luscre, D., & Gast, D. L. (2011). Effects of a story map on accelerated reader post reading test scores in students with high-functioning autism. *Focus on Autism and Other Developmental Disabilities, 26*(4), 218-229. https://doi.org/10.1177/1088357611423543

Tranfield, D., Denyer.D., & Smart., P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, *14*(3), 207-222. https://doi.org/10.1111/1467-8551.00375

Whalon, K., Delano, M., & Hanline, M. F. (2013). A rationale and strategy for adapting dialogic reading for children with autism spectrum disorder: RECALL. Preventing School Failure, 57, 93-101.

Whalon, K., & Hart, J. E. (2011). Adapting an evidence-based reading comprehension strategy for learners with autism spectrum disorder. *Intervention in School and Clinic, 46*(4), 195-203. https://doi.org/10.1177/1053451210389036

Whalon, K., & Hanline, M. F. (2008). Effects of a reciprocal questioning intervention on the question generation and responding of children with autism spectrum disorder. *Education and Training in Developmental Disabilities, 43*(3), 367-387.

Whalon, K., Hanline, M. F., & Davis, J. (2016). Parent implementation of RECALL: A systematic case study. *Education and Training in Autism and Developmental Disabilities, 51*(2), 211.

Whalon, K., Martinez, J. R., Shannon, D., Butcher, C., & Hanline, M. F. (2015). The impact of reading to engage children with autism in language and learning (RECALL). *Topics in Early Childhood Special Education, 35*(2), 102-115. https://doi.org/10.1177/0271121414565515

Whalon, K., Otaiba, S., & Delano, M. (2009). Evidence-based reading instruction for individuals with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 24*(1), 3-16. https://doi.org/10.1177/1088357608328515

What Works Clearinghouse. (2010). *What Works Clearinghouse Intervention Report: Early Childhood Education Interventions for Children with Disabilities: Dialogic Reading*.

Williamson, P., Carnahan, C.R., & Jacobs, J.A. (2012). Reading comprehension profiles of high-functioning students on the autism spectrum: a grounded theory. *Exceptional Children,* 78(4), 449-469. https://doi.org/10.1177/001440291207800404

Woolley, G. (2016). Reading comprehension intervention for high-functioning children with autism spectrum disorders. *Australian Journal of Learning Difficulties, 21*(1), 41-58. https://doi/full/10.1080/19404158.2016.1190770

Wong, C., Odom, S. L., Hume, K., Cox, A. W., Fettig, A., Kucharczyk, S., Brock, M, Plavnick, J., Fluery, V., Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group. https://doi.org/10.1007/s10803-014-2351-z

Zimmer, K. (2017). Enhancing interactions with children with autism through storybook reading: A caregiver's guide. *Young Exceptional Children, 20*(3), 133-144. https://doi.org/10.1177/1096250615593327

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Working Together: Graduate Level Special Education Teacher Recruitment Through a School-University Partnership

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Abstract

Recruiting special education teacher candidates to teacher preparation programs and to special education classrooms continues to be a national struggle (National Center for Education Statistics, 2022; United States Department of Education, 2021). While a number of solutions to this decades-long problem have been explored, we offer the analysis of a school-university partnership designed to target active, certificate-holding general education teachers for inclusion in a special education certificate program. The program of focus is designed to prepare general educators for certification eligibility and practice as highly-qualified special education teachers intent upon remaining in their current P-12 districts. The value of having general education teachers and special education teachers engage in co-professional development, particularly focused on co-teaching, has a history of successful collaboration (Miller & Oh, 2013). It is plausible, then, to recognize the value of preparing successful general educators to transition to the special educator role (Fee et al., 2012). An outline of a cohort-designed special education graduate certificate program is described. Results are reported based on data obtained from completer surveys, qualitative interviews, and Praxis examination scores. Suggestions for ways in which human resource professionals can help foster school-university partnerships are provided.

Keywords: P-12 Partnerships, Cohort models, Grow-Your-Own (GYO)

Working Together: Graduate Level Special Education Teacher Recruitment Through a School-University Partnership

School-university partnerships are crucial components of effective teacher preparation programs (Darling-Hammond, 2010) and hold the potential to serve as a vital tool in combating teacher shortages (Maheady, et al., 2016). By working directly and intentionally with P-12 school partners, universities are able to design teacher preparation programs that target specific needs of local districts. In this paper, we outline the ways in which a school-university partnership yielded the creation of an accelerated graduate-level certificate program which served to increase the available pool of special education teachers in a large district in the Southeastern United States.

Institutional Review Board approval for this study was granted on May 9th, 2022. To promote program enrollment and participant success, this program was grounded in tenets of affirmed professional development practices, including aligning the program to needs in local schools and encouraging collective participation using a cohort structure (Desimone & Garet, 2015). Similarly, this partnership embodied vital components of the nine essentials for school-university

partnerships espoused by the *National Association for Professional Development Schools* (NAPDS).

The enacted program included tuition relief from the university and tuition assistance from the district, reflecting an NAPDS (2021) essential item regarding the need for augmented support by partner entities beyond regularly occurring resources. The program was built upon the premise that districts have vested interest and vital knowledge of the teachers working within their districts and that teachers themselves value the need for continued learning and opportunities to lead. By working with districts to identify successful general educators already teaching within a district, and by incorporating teacher autonomy to engage in the program development process and then in the full curriculum, the university was able to craft graduate level programming which allowed educators to expand their professional skill set and request the addition of a special education credential to their active certificates. This allowed the district to utilize teachers in ways that best meet the needs of students and staffing realities while increasing the knowledge bases of their teachers, advancing teachers' careers, and potentially leading to teacher certificate and salary advancements. The essence of this program demonstrated the NAPDS (2021) third essential of professional learning and leading as well as the fourth essential of reflection and innovation.

The partnership outlined in this study is one that was forged through mutual interest. As a university facing increasing pressures to increase enrollment, university-level program leaders sought creative pathways to recruit in an era when morale for enrollment in teacher preparation programs is particularly low (Bryner, 2021). Likewise, P-12 districts currently struggle to fill Special Education positions as the needs of students outpace the supply of highly qualified special educators (Billingsley & Bettini, 2019). Through conversation and collaboration, we forged a P-12/University partnership intent upon supporting one another, yielding a program designed to fill the typical school-university gap that promoted working across traditional institutional boundaries and roles (NAPDS, 2021).

Program Design

As a function of ongoing collaborative P-12/and university efforts, a cohort-oriented certificate program was designed and is the focus of this paper. In the state where this program was initiated, certified teachers may add additional areas of certification through a variety of pathways. One such pathway is to complete relevant and related coursework coupled with the successful passing of any mandated assessments, which, in this case, were Praxis examinations. Building upon these pathways, the college designed an 18-credit hour program that met state requirements with a focus on Learning Disabilities. Learning Disabilities was selected in collaboration with the district as this area represented the greatest area of need.

In addition to the content focus on Learning Disabilities, other considerations were debated in concert with the P-12 district, teachers, and the college in order to meet the needs of practicing educators and to provide voice to all stakeholders in the spirit of shared governance, the seventh NAPDS (2021) essential component. Including teacher voice in information sessions was particularly important in developing the program and has been cited as an essential practice in creating effective professional learning for practicing educators (Haug & Mork, 2021).

As the conclusion of these sessions, held both in-person prior to the pandemic as well as via Zoom, the decision was made to offer the program fully online and asynchronously in order to accommodate the multifaceted needs of working professionals. The preference for online course access for this program echoed other professional learning experiences for working teachers (Stover & Elston, 2021). Courses were designed to be taught in intensive six-week sessions. By using this approach, students were able to take six hours in the summer, six hours in the fall, and six hours in the spring in order to complete the necessary courses in less than one calendar year, leaving the following summer for the completion of any testing requirements. By partnering with a local P-12 district, teachers were recruited from similar spaces to participate in a cohort model. This meant that teachers from the same district took the same classes in the same order together, offering a platform for community support. The partnership was formalized with an articulation agreement between education entities, another NAPDS (2021) essential element. The program of study can be found in Table 1.

Table 1
Program of Study

Term	Course
Summer I	EDFS 501 Introduction to Exceptional Children and Youth
Summer II	EDFS 550 Classroom and Behavior Management
Fall 2022 Express Sessions	EDFS 520 Characteristics of Students with Learning Disabilities
	EDFS 528 Educational Procedures for Students with Learning Disabilities
Spring 2023 Express Sessions	EDFS 525 Literacy Development and Intervention for Students with Disabilities
	EDFS 537 Educational Assessment of Students with Disabilities

The program began in the summer of 2020 and the second cohort of completers graduated in spring of 2022. We have sought to understand how well the program is meeting the needs of stakeholders. Specifically, this study was guided to focus on the barriers and facilitators of student and program success.

The data for this descriptive case study (Mills & Jordan, 2023) study included quantitative data related to Praxis examinations, student input through qualitative completer interviews, and qualitative semi-structured interviews. Quantitative data were analyzed using descriptive statistics with particular attention to measures of central tendency, and specifically mean scores, when considering the results of completer surveys. Praxis examinations were analyzed by percentage passed. Qualitative data were analyzed using qualitative descriptive methods (Lambert & Lambert, 2012). Interviews were transcribed and open coded. Then, a coding structure was established and the data were re-coded and analyzed for theme development.

Guiding Literature: Fulfilling Vacancies & Successful Partnerships

The need to produce, recruit, and retain teachers, particularly special education teachers specifically, is not a new issue for human resources staff, as evidenced by the title of Butler's (2008) article, "Desperately Seeking Special Ed Teachers." Indeed, the majority of states and school districts in the United States recently reported special education teaching vacancies (Monin, et al., 2021). During the early stages of the COVID-19 pandemic in 2020, human resource professionals working in school districts reported focusing on COVID-19 procedures, socioemotional learning, and understanding online technology for learning. As the pandemic continued, K-12 human resource professionals shared that top priorities in their work shifted from COVID and technology issues to teacher recruitment and retention being two of the highest needs (Kuykendall, 2022).

Human Resource and Agency Efforts to Address Teacher Vacancies

Human resource professionals, in concert with states, districts, and schools, have employed multiple initiatives to address the paucity of available special education teachers. Some states are considering reducing requirements for special education teachers or placing underprepared and non-credentialed teachers in special education classrooms (CEEDAR, 2018; Lambert, 2020). Other programs have focused on stimulating interest in the field of special education through different approaches.

Financial incentives have frequently been used through school district human resource departments to attract teachers, and specifically special education teachers, to apply for open positions and to remain in those roles. Historically, examples of financial incentives include hiring bonuses, student loan forgiveness programs, annual stipends, and differential salary scales (Fall, 2010; Putney, 2009). In 2022, Tennessee is implementing an apprenticeship program with no- expense teacher preparation. In 2021, Indiana had a new program focused specifically on special education that offers college scholarships, funding to earn a special education credential with an undergraduate degree outside of education, and free support to pass required teacher certification exams.

In a 2022 report from The National Center on Teacher Quality, Putman and Gerber reported that school districts offer financial increases as the primary means of attracting special education teachers and that a few districts offer tuition reimbursement. An analysis of financial incentives in Florida revealed that a loan forgiveness plan had positive effects on special education teacher retention when amounts offered to special educators were double or more of amounts offered to other educators (Feng & Sass, 2018). Other states and districts continue to explore financial routes to staff special education needs, with Hawaii providing the most recent, dramatic incentive. The state increased the pay of special education teachers by $10,000 in 2020 and special education vacancies have been cut in half (McCoy, 2022).

Other efforts have centered on supporting special education teachers in the early years of their careers through mentoring. Working to provide a system of support for new special education teachers may prevent feelings of professional isolation and serve to retain educators and increase their efficacy. Implementation of support structures have taken the form of specific induction programs, dedicated mentors, specific time during the school day to collaborate with other

teachers, proximity to other teachers, and co-teaching (CEEDAR 2018; Fall, 2010; Lambert, 2020).

University Educator Preparation Program Efforts to Address Teacher Pipeline

Educator preparation programs have similarly devoted resources and efforts to encourage their students to consider careers in special education. Approaches have included offering scholarships or tuition assistance, attracting special education teacher candidates from other education and non-education majors, and recruiting potential special education future teachers through partnerships with area high schools (Zascavage et al., 2008). Some teacher education institutions offer pre-service programs in which future teachers are credentialed in special education and another general education area or discipline upon graduation. Theobald et al. (2021) examined dual-licensure in Washington and reported negative relationships with regard to dually certified teachers starting and remaining in special education positions versus working in their other area of certification.

Partnerships Between Districts and Universities to Address Teaching Needs

Just as school districts seek to identify special education candidates to fill classroom vacancies, educator preparation programs (EPP) seek to recruit special education majors to bolster enrollment numbers and to provide teachers for P-12 partners. Connections between districts and EPPs are so important for the development of new teachers that the Council for the Accreditation of Education Preparation (CAEP) includes specific requirements regarding collaboration between EPPs and schools, including awareness of teaching vacancy needs as a driver for university program development and recruitment (2021).

Grow-your-own (GYO) teacher programs provide recurring examples of EPP and district partnerships and have existed since at least the 1980s (Heller, 2021). Central to GYO program development and success is the breadth and depth of the partnership between a local or state education agency and aligned EPPs. GYO programs have become increasingly prevalent in recent years, including opportunities to apply for federal grant support from the United States Department of Education (2022). These models tap into local communities where potential teachers are comfortable, committed to staying, and knowledgeable about the nuances of a specific region. Ideally, teachers recruited through this process will remain in schools in the geographic area in which they were trained (Gist, 2022).

GYO programs often take one of two routes. One route focuses on exposing middle and high school students to the teaching profession through coursework and experiential learning, assisting potential teachers through college teacher education programs, and then hiring graduates to teach in local schools. Another route focuses on adult learners completing bachelor's degrees, making career changes, and those already working in schools in non-teaching positions (Gist, 2019; Valenzula, 2017).

Analyses of GYO program outcomes with regard to teacher retention and student achievement have focused primarily on programs that prepare candidates for initial teacher certification. Research has included investigations of general and special education teachers with varied results, sometimes tied to other variables (e.g., undergraduate or graduate instruction; urban or rural settings; type of GYO model, etc.) (Education First, 2016; Office of Special Education

Programs, 2021). Varied results have been reported and agencies and researchers have called for additional research regarding GYO programs (Gist, 2019; Office of Special Education Programs, 2021).

Partnerships Between Districts and Universities to Fill Special Education Teaching Needs

A logical candidate pool for GYO and similar programs seeking to recruit and prepare special education teachers are paraprofessionals. These candidates are already working in schools, are familiar with local education policies and practices, and in some instances are already functioning in support positions within special education settings, partnered with experienced special educators. Multiple states, including but not limited to Arizona, California, North Carolina, Oregon, Tennessee, and Texas, have previously or currently intentionally provided support for paraprofessionals to become licensed teachers, including programs focusing on special education (Arizona Department of Education, 2022**;** Butler, 2008; Galloway, 2019; Heller, 2021; Putney, 2009; West, 2022).

Another potential candidate pool to recruit and prepare special education teachers that has previously received less attention than the paraprofessional pathway exists - currently practicing, certified general education teachers. Brownwell and Sindelar (2016) specifically called for funding and incentives to recruit general education teachers to train in special education. Similar to the framework for recruiting paraprofessionals to become special educators, individuals already teaching in a community are rooted in the area, understand local schools, and will perhaps be likely to stay as a special education teacher (Butler, 2008; Fee et al., 2012). Additionally, candidates who are already certified teachers have previous pedagogical preparation and experience that flattens the learning curve for special education preparation. General education teachers have often worked with special education teacher colleagues on Individualized Education Programs and differentiation within their own classrooms for students with exceptional needs. They may already have had coursework at the introductory level to learner exceptionalities and would be at least cursorily familiar with terminology and assessments that are prevalent within the special education discipline.

A review of extant literature revealed an example of a GYO program partnership between the University of Guam, the Guam Department of Education, and the Guam Commission on Teacher Certification that was designed to recruit general education teachers to acquire training, expertise, and certification to serve as special education teachers. This accelerated program was completed in a year, used a cohort model, and recruited veteran teachers who were already certified. In this example Guam, funding originated from a combination of special university sources, contingent on teaching in Guam for a year after the program, and loan forgiveness programs for teaching in a low-income school. Across the program's first four years, 130 special education program completers graduated which not only addressed special education teaching vacancies but also provided special educators with a working knowledge of local cultural realities in classrooms with exceptional learners (Fee et al., 2012).

Of special note was the importance of the Guam program's cohort model through which the complex realities of the adult learners' lives were recognized and supported via personal relationships (Fee et al., 2012). The benefits of cohorts for graduate education program success, particularly for practicing educators returning to school and for educators in online learning

environments, continue to be documented in professional literature (Fifolt & Breaux, 2018; Winn et al., 2020).

State agencies have announced new initiatives in partnership with EPPs to attract special educators. The state of Indiana recently launched a program to increase the number of special educators in the state. One of the program components is an option for already certified teachers to engage in a fully-funded graduate program at one of three universities to add special education as a new certification area (Indiana Department of Education, 2021). Similarly, the state of Arizona has started a reimbursement program for already licensed teachers seeking to add special education to their certificates (Arizona Department of Education, 2022).

Promoting the development of strong special educators from the current general education teacher pool is one viable long-term solution to vacancy and attrition issues (Brownwell & Sindelar, 2016). Consistent across efforts to recruit and retain special educators is the importance of reciprocal relationships between educator preparation programs and schools, districts, and states to understand the landscape of the special education teacher pipeline from multiple perspectives. Teacher education programs and education agencies must collaborate, communicate often, identify needs, and create shared visions for partnership programs to thrive (Education First, 2016). Intentionality to grounding programs in existing and successful partnership models, like aspects of the nine essentials from NAPDS (2021), is crucial. The program described in this paper drew from various NAPDS (2021) essential partnership aspects including: professional learning and leading, articulation agreements, shared governance, reflection and innovation, boundary-spanning roles, and resources and recognition. Funding, teacher preparation quality, program evaluation, and access to potential candidates who will matriculate as qualified special educators are all issues dependent upon partnerships success across education agencies (CEEDAR, 2018; Galloway, 2019; Putney, 2009).

Methods

This study took a descriptive case study approach to answer the research questions, which were:

1. What are the facilitators of student and program success in a cohort-based, graduate level, collaborative model?

2. What are the barriers to student and program success in a cohort-based, graduate level, collaborative model?

According to Mills and Jordan (2023), descriptive case study in education is often used to describe, “institutions, programs, and practices, including how they have changed over time” (p. 343). Given the applied and practical nature of this study, we worked to collect all data, with the intent to describe, then considered the collective implications of the totality of the combined data.

To offer further specifics, quantitative data were collected as a natural part of the program evaluation process and are collected regularly, regardless of any planned study. This included collecting data focused on the completion of mandatory testing, such as Praxis, as well as

completer surveys. Those data are useful and necessary, providing insight into the ways in which the program is, or is not, achieving intended goals.

Qualitative interviews, however, offer perhaps a more nuanced insight. It was in these interviews that we were able to better understand the nuances of the program from the perspective of program completers, including the barriers and facilitators they faced in implementation of their learning and, ultimately, their new certification in special education. Qualitative interviews focused on four main areas: Motivation to Enroll in a SPED Graduate Certificate Program, Cohort Structures, Coursework Reflections, and Effect on Teaching. The semi-structured interview protocol can be found in the Appendix.

Qualitative descriptive methods (Lambert & Lambert, 2012) were used to analyze these qualitative data. While other methods were considered, our sample is much too limited to have engaged in more rigorous resampling approaches. Instead, as Lambert and Lambert (2012) described, our intent was to provide a "comprehensive summarization, in everyday terms, of specific events experienced by individuals or groups of individuals (p. 255). Still, we attempted to consider our data in a formulaic way, allowing themes to emerge. In particular, these interviews were audio recorded, transcribed, and coded for themes. Author 1 conducted the initial coding and developed overarching codes and themes. Author 2 then reviewed the initial suggested findings of Author 1, confirming the coding structure and helping to further develop final themes. Author 1 and 2 engaged in repeated conversations through in-person and telephone communications, discussing the themes and debating the goodness of fit of the themes to the data. Author 3 served as final member of the analysis team, providing extra credibility to the analysis as this author was pivotal in qualitative data collection. To arrive at final themes, the research team engaged in ongoing and reflective discussion. We worked to understand how the quantitative themes, reported in descriptive statistics, may help us to better form qualitative themes as we sought out an understanding of areas of the totality of the quantitative and qualitative data. In other words, our data analysis was a convergent process, considering the totality of our data set alongside the obvious limitations of our sample.

Results

Since the program began in 2020, two cohorts of students have completed, yielding a total potential population of 18. Special Education, as a field, is experiencing a substantial teacher shortage, thus the low number of program completers. Each member of the cohort is a current practicing general education teacher in a major Southeastern public district in the United States. Participants range in teaching experience from 1 to more than 20 years across multiple certification areas (e.g., early childhood, elementary, middle grades, secondary career and technical education). As of this analysis, 94.4% (n = 17) of program completers were teaching with the partner district, one teacher moved. Half of program completers (n = 9) were already in positions working with special education learners with the possibility of more teaching assignment shifts for the next academic year. All students were asked to submit Praxis examination score reports, were offered the completer survey, and were invited to participate in qualitative interviews. Nine students (n = 9) submitted Praxis examination scores, 10 students (n = 10) completed the completer survey, and six students (n = 6) participated in one-on-one, semi-structured interviews. While we acknowledge that this sample is limited, particularly with regard

to qualitative interviews, we also note that these samples are samples of convenience. All students who qualified were invited to participate.

Quantitative Data

State-required Praxis examinations required to add the field of Learning Disabilities to an active teaching certificate included the passing of exam number 5354, which is a test of core knowledge, as well as test number 5383, which is focused on content specific to the field of Learning Disabilities. At present, all students who have reported (n = 9) have passed the necessary examinations. It is critical to note that in this program, the university is not recommending for licensure, but rather the individual is pursuing add on licensure. As such, the university does not automatically receive score reports, as they would in an initial certification situation. For these reasons, students may choose whether they report to the university, thus reducing the overall sample size. Additionally, there is no time limit for when students must take Praxis exams, also potentially impacting sample size for the current analysis.

The completer survey yielded additional quantitative information. Following the end of our graduate certificate program in Special Education, we requested that completers respond to an exit survey about their experiences. The survey consisted of 25 items allocated as follows: 21 items about program content and preparation for teaching in special education; three items about program faculty availability, graduate admissions, and use of tuition vouchers (if applicable); and one item about the overall effectiveness of the program. All items were rated on a scale from 1 to 4 with 1 being the lowest rating and 4 being the highest rating. Optional, open-ended comment sections for respondents were available. These were not included as part of the analysis due to a small sample size of open-ended comment completion.

For the 21 program content and preparation the possible responses were as follows: Not at all prepared (1), Poorly prepared (2), Adequately prepared (1), and Well prepared (4). For the 3 items about faculty, admission, and tuition vouchers, the possible responses were: Very Dissatisfied (1), Dissatisfied (2), Satisfied (3), and Very Satisfied (4). For the final item about program effectiveness the possible responses were: (1) Not effective, (2) Somewhat effective, (3) Appropriately effective, and (4) More than effective.

We set a desired threshold for each item as well as a threshold that would indicate we need to monitor an area(s). Our desired threshold was for 80% or more of respondents to score each indicator at a level 3 or 4; items below that threshold would be examined carefully for action. We also considered open-ended comments from respondents during analysis.

The 21 items about program content and preparation for teaching in special education were aligned to the Interstate Teacher Assessment and Support Consortium (InTASC) domains (i.e., The Learner and Learning, Content, Instructional Practice, and Professional Responsibility) and to the standards from the Council for the Accreditation of Educator Preparation (CAEP), our institution's national educator preparation program accrediting agency.

The survey was administered virtually via a Qualtrics survey link. All responses were kept private and confidential. Personally identifying information is not included in analyses. Across

the two cohorts, 18 survey invitations were sent and 10 surveys were completed and submitted for a response rate of 55.6%, yielding a sample of 10 for analysis ($N = 10$).

On 20 items, 100% of respondents rated at level 3 or 4, and on another 4 items, 90% of respondents rated at level 3 or 4. The only item that approached the monitoring threshold was the item, "Engages students actively in the self-assessment process," for which 80% of respondents rated at level 3 or 4 and 2 respondents scored the item at level 2. Means across the 25 survey items were all above 3.00, ranging from 3.20 to 4.00. The overall mean of all items was 3.73 ($SD = 0.17$). Table 2 represents each individual question along with the mean for each individual item.

Table 2
Completer Survey

Items Focused on The Learner and Learning	Mean
Promote students' growth and development	3.8
Respect students as individuals with differing personal and family backgrounds and various skills, abilities, perspectives, talents, and interests	3.9
Establish a climate of learning where students value and support each other's learning (peer relationships)	3.9
Support students as they engage in purposeful learning	3.8
Items Focused on Content Knowledge	
Work toward each student's mastery of disciplinary content and skills	3.6
Recognize the potential of bias in my representation of the discipline	3.8
Keep abreast of new ideas and understandings in the field	3.8
Embrace flexible learning environments that encourage student exploration, discovery, and expression across content areas	3.7
Items Focused on Instructional Practice	
Align instruction and assessment with learning goals	3.6
Engage students actively in self-assessment processes	3.4
Provide timely and effective descriptive feedback to students	3.7
Use multiple types of assessment to support, verify, and document learning	3.6
Make accommodations in assessment and testing conditions	3.8
Use students' diverse strengths and needs to plan effective instruction	3.7
Use new and emerging technologies to support and promote student learning	3.8
Items Focused on Professional Responsibility	
Manage potential biases within my own frame of reference (e.g., culture, gender, language, abilities, ways of knowing).	3.9
Seek opportunities to draw upon current education policy and research as sources of analysis and reflection to improve practice	3.5
Adhere to codes of ethics, professional standards of practice, and relevant law and policy	3.9
Use ongoing analysis and reflection to improve planning and practice	3.7
Implement continuous improvement and change in the classroom	3.8

Share responsibility for shaping and supporting the mission of my school as an advocate for students	3.8
Items Focused on Satisfaction	
Availability of program faculty	3.8
Graduate School Admission Processes	3.7
Tuition Voucher Redemption Process (if used)	4.0
Overall Satisfaction Rating	
How effective do you perceive the College of Charleston School of Education Health and Human Performance has prepared you to become a teacher?	3.2

Overall, these data suggested that program completers were satisfied with the program, finding value in the pacing, structure, and nature of the course work. They also found the coursework to be relevant to their practice, reporting an overall feeling of being well-prepared to engage in the work of Special Education. The 100% reported Praxis pass rate supports these findings. While these data are certainly relevant and informative, a more complete story is found in the qualitative analysis.

Qualitative Data

In addition to the quantitative data, qualitative data were also collected. Six students ($n = 6$) participated in semi-structured, one-on-one interviews. These data were coded and themes were developed using qualitative descriptive methods (Lambert & Lambert, 2012). After engaging in initial coding, subsequent conversation amongst co-authors, and an analysis of the quantitative data, the authors determined that four themes emerged from these data. The first two themes focused on facilitators of program completion and perceptions of success while the third and fourth themes focused on clearly defined barriers. The themes related to facilitation of success are defined as follows: 1) Money Matters and 2) "Real Life" Pacing. The second two themes related to barriers. These themes are defined as 3) Preparation and Practice Disconnect and 4) Macro-Level System Failures. Each of these barriers is discussed in the following sections.

Themes of Facilitation

As universities continue to wrestle with dwindling enrollment in teacher education and as P-12 schools continue to struggle to fill relevant positions in special education, it is important to consider the ways in which students can be supported not only to complete graduate-level programs, but also to implement what was learned in a way that aligns with best practice. Two themes related to successful program completion and implementation emerged from these data.

Money Matters

The first theme to emerge from these data was the reality that money matters when it comes to recruiting and maintaining students in teacher preparation programs. In the evaluated partnership, the university offered a discounted tuition rate to the P-12 district and the P-12 district offered a financial incentive to program participants. In fact, this contribution was significant, viewed as an investment with return opportunities on behalf of the P-12 district. The

district paid for five of the six courses, receiving a discounted cohort rate from the university. The sixth and final class had to be covered by the student in one of two ways. First, the student could of course pay out of pocket. Second, by hosting student teachers from the institution's undergraduate teacher preparation programs provided by the university, teachers could receive a course voucher which covered the cost of a graduate level course. So, in effect, the program could be completed at no cost to the student. In return, the student agreed to teach a high need special education area in the district for a period of three years, or one year for each semester of provided funding. This proved to be a significant facilitator to program engagement and completion, and in fact, participants described this as a facilitator of success as well as a facilitator of perceived stress reduction.

When asked whether they would have participated in the program without financial support, one participant stated, *"No, I wouldn't have, honestly, because I'm still paying for a masters program, so no, if it was not for the financial incentive, I wouldn't have been able to."* This was a consistent theme among participants. The reality of the current economic situation for P-12 teachers is that without support, they simply were not willing to, or were not able to, take on additional debt to meet their professional goals. Another student added, *"I don't know if I would have done it with the pandemic and everything, but the fact that it was being paid for, really cinched it for me."*

In many ways, this theme is fairly obvious. Money matters to a group of people who are historically underpaid and who have to wrestle with the rising costs of college in order to advance professionally. However, we feel this theme was too prevalent throughout the data to ignore. Sometimes, the shortage of special educators may not be so simple as to say it is a matter of disinterest in the position. In the case of our students, money stands squarely in the way of intelligent, well-intended human beings who want to make a difference.

"Real Life" Pacing

The second theme facilitating successful program completion and implementation for these students hinged around the creation of a curriculum pacing that fit the lives of working adults. One student stated:

> *I loved that it was online, asynchronous. I could do it at any time. The hours of the night I could get up and get going. I didn't have to do it every day. I didn't have to show up face to face with a class. The tutors were available. They had their office hours. Even with sending an email, they were quick to respond. So they really made themselves available.*

This theme repeated itself throughout the data. Participants appreciated that their lives were "seen." They appreciated that the working and family realities which made up their day-to-day lives were not only acknowledged, but also respected, and respected without a compromise in content or program difficulty.

In addition to the simple pacing aspect of the program, participants also expressed appreciating how the cohort model mirrored "Real Life." For example, one student stated, "*With the cohort, I actually had two other teachers within my school that were doing the same program. So we*

could kind of relate what we were doing in the classes back to our own school. So, that was helpful."

Participants consistently expressed the online, asynchronous, cohort model as a model that worked with their lives. That said, of course some students still expressed hesitations, particularly with the rigorous pacing of the content. By completing the course work in a calendar year, the needs of the district are rapidly met. However, it must be acknowledged that this is not easy. For example, one participant stated,

> *The structure in terms of the courses that we did, those were right on. Those were definitely courses that helped me to understand the students I'm teaching currently and help me in the future of the new career I'm taking on. One of the things is, I think we went through a little too fast. So we did it in one year. Because I have so much years of experience, background experience in education, some of it wasn't very difficult for me, so I could relate to lots of the information that was in the courses. Some of course the ones that were new to me, I wanted to get a deeper, maybe a longer time to grasp the concepts and to grasp the knowledge.*

The reality of this difficulty did not outweigh the benefit of speed of completion, but this viewpoint should not be ignored, nevertheless.

Barrier-Related Themes

While participants clearly expressed the facilitators that helped them complete the program and implement their learning, of course, barriers also existed. Among our participants, discussions of two major barriers dominated the data. These barriers are beneficial to understand the human resources aspect of program development and recruitment.

Preparation and Practice Disconnect

Perhaps one of the most prevalent barriers to degree implement included a difficulty for participants to see the connection between their preparation and practice. Participants often expressed a disconnect, particularly in regards to the Individualized Education Program (IEP) process. For example, one participant stated,

> *The IEP... The structure of it and everything was really good, but the problem for me was that we were on teams and we were all virtual. And so I felt like my group, there was, I think, one person that was nervous about getting it done. So she just did the whole thing basically. And I felt like because it was virtual and because we were in groups like this, it was hard to communicate and really get as much out of it as I wanted to. I wish it would've either been partners or you just write your own, since that's what we ended up having to do. So I feel like the experience I had with that project didn't really prepare me for the next year as far as writing IEPs.*

When designing the course content, university professionals imagined the IEP writing process as one that should be collaborative, just like it is in practice. However, participants expressed frustration and tended to want to complete this process on their own.

Additionally, participants expressed frustration with the formatting of structures such as IEP writing. One participant stated,

> *I've talked to some other people that were in the program, and now that we've had our first year teaching in SPED, I think, since it was a district cohort, when we wrote that IEP, if it had been tailored to the format that district uses...*

Other participants expressed this frustration as well. Ironically, participants did use the same format as the school district. However, they were asked to write their IEPs using a paper form instead of the online, digitized system the district uses. The reason for this was simple: The university did not have access to the expensive IEP management system employed by the district. Still, participants did not make this connection in practice, meaning the connection between preparation and practice was not fully made and this is a point of reflection for program improvement.

Macro-Level System Failures

Finally, the last theme focuses on macro-level system failures. The reality of modern universities is that systems like admissions, financial aid, and registration can all be complicated and less-than-user-friendly. Students expressed a number of these frustrations. For example, when discussing the use of a tuition voucher, one participant stated,

> *I filled out the paperwork beforehand but then I guess I had to fill it out again and resubmit it, because I didn't fill it out correctly. So this is what I did. At the end of having my student teacher, the college asked how do I want to be compensated. Do I want to get a stipend or class voucher. So I chose the class. And because of that, I just had assumed that I was in the system for the college then once I did the cohort for SPED. But then I had to resubmit paperwork. So that was just annoying. It was just an extra step. Had that been joined together, that would've been lovely. But I freaked out with that because I was like, "Oh my god, I owe that much?"*

The university has many different protocols for enrollment, financial aid, voucher usage, etc. These systems often caused students to struggle, increasing their stress as noted in the previous comment. When program revisions are considered, this must be a factor. Streamlined processes lead to improved user experiences.

COVID-19

Finally, though this was not a decided theme, considering the totality of the data in absence of the reality of the COVID-19 pandemic would be remiss. The COVID-19 pandemic has contributed immensely to the number of teachers leaving the profession. This difficult period has left many teachers feeling unsupported and distressed, and this was reflected in our data. Participants expressed increased pressures to teach a growingly diverse group of students in increasingly diverse modalities all while receiving little additional support. Results and discussions focused on these data should consider the nuance of the current educational landscape.

Discussion: Applying These Findings to Teacher Education

In this study, we explored the barriers and facilitators to a P-12/University partnership focused on closing the gap of qualified professionals in a local district. The themes addressed noted those barriers and facilitators. However, it is important to consider the ways in which these themes may impact the human resources aspect of these partnerships.

First, we suggest that universities and P-12 partners, as well as researchers, consider the lived realities of the teachers they wish to recruit. It is easy to focus on program completion numbers, recruitment initiatives, and many other quantitative markers. In this study, however, it was the qualitative lived realities of participants that helped us reimagine the ways we must go about recruitment, implementation, and ongoing support. At this juncture in American history, P-12 teachers may very well be more stressed than ever. They are experiencing a difficult financial reality coupled with increasing student health and well-being needs, both physical and mental. Understanding this reality, universities and P-12 partners must consider the ways in which they can make their programs and their working conditions more inclusive, recognizing the necessary reality of the student or job responsibilities and not compromising rigor, but doing so from a position of grace and understanding of the lived realities of people.

Second, when considering the recruitment of individuals and the forging of partnerships, macro-level systems must be reimagined. Universities and P-12 partners must essentially be messengers of the same story so that students receive similar messaging. We offer a strong critique of our own process in this regard. As participants pointed out macro-level system failures, we cannot help but reflect on the ways in which we can improve these processes. At the same time, participants recognized macro-level organization structures that were also highly supportive, such as the cohort model of recruitment and course completion. Universities and P-12 partners should continue to find approaches such as this which support the natural environments of teachers in schools. Future researchers should also explore the impacts of connected messaging between school and university partners.

Finally, and perhaps most importantly, our own reflections on these data have helped us understand the importance of the reconceptualizing of the "story" of special education. We stand by the long-told reality that special education should not be a "place." Rather, special education is a service. In the twenty-first century, we would add that special education is not just a service, but rather, it is an idea for an inclusive society. It is a legally mandated system which ensures a free and appropriate public education for all, a quite radical democratic ideal. As we reflect on human resource implications, we offer the suggestion that this story of special education matters now perhaps more than ever. Students are afraid of the paperwork and the pedagogy of special education. Students, however, are not lacking the will to innovate and advocate for persons with disabilities. This is the "special education" we must use for recruitment as we contemplate the human resources side of vacancy reduction in the field of special education.

References

Arizona Department of Education. (February, 2022). *Recruitment & Retention Info: GETSET and SETTA tuition assistance programs*. https://www.azed.gov/specialeducation/recruitment-retention-info-getset-and-setta-tuition-assistance-programs-0

Billingsley, B., & Bettini, E. (2019). Special education teacher attrition and retention: A review of the literature. *Review of Educational Research*, *89*(5), 697–744. https://doi.org/10.3102/0034654319862495

Brownwell, M., & Sindelar, P. (2016, March 16). Preparing and retaining effective special education teachers: Systemic solutions for addressing teacher shortages. *EdPrepMatters.* https://edprepmatters.net/2016/03/preparing-and-retaining-effective-special-education-teachers-systemic-solutions-for-addressing-teacher-shortages/

Bryner, L. (2021). The teacher shortage in the United States. *Education and Society*, *39*(1), 69–80. https://doi.org/10.7459/es/39.1.05

Butler, K. (2008). Desperately seeking special ed teachers. *District Administrator, (44)*13, 23-26.

CAEP (2021). *2022 initial level standards*. https://caepnet.org/~/media/Files/caep/standards/2022-initial-standards-1-pager-final.pdf?la=en

CEEDAR Center. (2018). *Preparing and retaining effective special education teachers: Short-term strategies for long-term solutions.* https://ceedar.education.ufl.edu/wp-content/uploads/2020/01/CEEDAR-GTL-Shortages-Brief.pdf

Darling-Hammond, L. (2010). Teacher education and the American future. *Journal of Teacher Education, 61*(1-2), 35-47. https://doi.org/10.1177/0022487109348024

Desimone, L.M., & Garet, M.S. (2015). Best practices in teachers' professional development in the United States. *Psychology, Society & Education, 7*(3), 252-263.

Education First. (2016). *Ensuring high-quality teacher talent.* https://education-first.com/wp-content/uploads/2016/01/Ensuring-High-Quality-Teacher-Talent.pdf

Fall, A. M. (2010). Recruiting and retaining highly qualified special education teachers for high-poverty districts: Recommendations for educational leaders. *Journal of Special Education Leadership, 23*(2), 76-83.

Fee, R. W., Fee, J.M., Snowden, P.A., Stuart, N.M., & Baumgartner, D. (2012). University of Guam special education program: Preparing special education teachers in a very diverse culture. *Interdisciplinary Journal of Teaching and Learning, 2*(3), 145-157.

Feng, L., & Sass, T. R. (2018). The impact of incentives to recruit and retain teachers in 'hard-to-staff' subjects. *Journal of Policy Analysis & Management, (37)*1, 112-135. DOI: 10.1002/pam.22037

Fifolt, M., & Breaux, A. (2018). Exploring student experiences with the cohort model in an executive EdD program in the southeastern United States. *The Journal of Continuing Higher Education, 66*(3), 158-169. DOI: 10.1080/07377363.2018.1525518

Galloway, M. (2019). Human resources special education teacher recruitment: Utilizing grow your own. *Journal of Transformative Leadership & Policy Studies, (8)*2, 65-87. https://doi.org/10.36851/jtlps.v8i2.2227

Gist, C. (2022). Shifting dominant narratives of teacher development: New directions for expanding access to the educator workforce through grow your own programs. *Education Researcher, 51*(1), 51-57. https://doi.org/10.3102/0013189X211049762

Gist, C., Bianco, M., Lynn, M. (2019). Examining grow your own programs across the teacher development continuum: Mining research on teachers of color and nontraditional educator pipelines. *Journal of Teacher Education, 70*(1), 13-25. https://doi.org/10.1177/0022487118787504

Haug, B. S., & Mork, S. M. (2021). Taking 21st century skills from vision to classroom: What teachers highlight as supportive professional development in the light of new demands from educational reforms. *Teaching and Teacher Education, 100*. https://doi.org/10.1016/j.tate.2021.103286

Heller, R. (2021). The grow-your own approach to teacher preparation. *Phi Delta Kappan (103)*3, 28-33. DOI: 10.1177/00317217211058511

Indiana Department of Education. (November, 2021). *Partnership aims to strengthen Indiana's special education teacher pipeline.* https://www.in.gov/doe/about/news/indiana-launches-licensing-assistance-program-for-special-education-educators/

Kim, H., Sefcik, J. S., & Bradway, C. (2016). Characteristics of qualitative descriptive studies: A systematic review. *Research in Nursing & Health, 40*(1), 23–42. https://doi.org/10.1002/nur.21768

Kuykendall, K. (2022). HR priorities now led by teacher recruitment, retention, and support PowerSchool study shows. *THE Journal*, https://thejournal.com/Articles/2022/02/28/HR-Priorities-Now-Led-By-Teacher-Recruitment-and-Support.aspx?Page=1

Lambert, V. A., & Lambert, C. E. (2012). Qualitative descriptive research: An acceptable design. *Pacific Rim International Journal of Nursing Research, 16*(4), 255–256.

Maheady, L., Magiera, K., & Simmons, R. (2016). Building and sustaining school-university partnerships in rural settings: One approach for improving Special Education Service Delivery. *Rural Special Education Quarterly, 35*(2), 33–40. https://doi.org/10.1177/875687051603500205

Mills, G. E., & Jordan, A.W. (2023). *Educational research: Competencies for analysis and applications*. Pearson.

Miller, C., & Oh, K. (2013). The effects of professional development on co-teaching for special and general education teachers and students. *Journal of Special Education Apprenticeship, 2*(1), 1–17.

Monin, K., Day, J., Strimel, M., & Dye, K. (2021, June 1). *Why now is the perfect time to solve the special education teacher shortage*. Council for Exceptional Children. https://exceptionalchildren.org/blog/why-now-perfect-time-solve-special-education-teacher-shortage

National Association for Professional Development Schools. (2021). *What it means to be a professional development school: The nine essentials* (2nd ed). [Policy statement.] Author. https://napds.org/wp-content/uploads/2021/05/What-it-Means-to-be-a-PDS-Second-Edition-2021-Final.pdf

National Center for Education Statistics. (2002, March 3). *U.S. schools report increased teacher vacancies due to COVID-19 pandemic, new NCES data show* [Press Release]. https://nces.ed.gov/whatsnew/press_releases/3_3_2022.asp

Office of Special Education Programs. (2021). *Attracting personnel: Grow your own*. https://osepideasthatwork.org/sites/default/files/A2-Grow-Your-Own-508.pdf

Putman, H., & Gerber, N.. (2022, May 12). *Strategies to build a sustainable special education teacher workforce*. National Council on Teacher Quality (NCTQ). Retrieved January 3,

2023, from https://www.nctq.org/blog/Strategies-to-build-a-sustainable-special-education-teacher-workforce

Putney, L. P. (2009). *Key issue: Recruiting special education teachers* (ED543671). (ERIC). https://files.eric.ed.gov/fulltext/ED543671.pdf

Stover, S., & Elston, A. E. (2021). An online book study approach to P-12 teachers' professional learning experience. *Education in a Democracy, 12*(1), 93-108.

U. S. Department of Education. (2021). Teacher Shortage Areas. https://tsa.ed.gov

Valenzuela, A. (2017). *Grow your own educator programs: A review of the literature with an emphasis on equity-based approaches.* ERIC. https://files.eric.ed.gov/fulltext/ED582731.pdf

Winn, P., Gentry, J., & Nguyen, A. (2020). Graduate student perceptions of cohort delivery and problem-based learning in online principal certification courses. *School Leadership Review, 15*(1), Article 26. https://scholarworks.sfasu.edu/slr/vol15/iss1/26

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Hannah Woods is College of Charleston alumni and an Exceptional Student Education teacher in St. Petersburg, Florida. Her teaching philosophy surrounds the idea that all children deserve a quality education, no matter their background or level of ability. After working in special-needs caregiver roles since the age of 15, Hannah took her experiences to the College where she was able to connect with several public-school teachers and interview them about their experiences. She believes that being a lifelong learner and demonstrating cultural competence is key to fostering a positive learning environment.

Appendix

Interview Questions

Motivation to Enroll in SPED Graduate Certificate Program

1. Please discuss your primary motivators for enrolling in the program (e.g., desire to be a SPED teacher, improving GenED practice, certificate advancement, salary increase, earning a graduate certificate, etc.).
2. To what extent did the district/college relationship for the SPED grad cert influence your decision to enroll?
3. Would you have enrolled without the district providing tuition for 5 of the 6 courses?

Cohort Structure

1. Please discuss how progressing through the SPED grad course impacted your learning and experience.
2. How did you view the express format with one course at a time across a few weeks?
3. The SPED grad cert was online, asynchronous. Please discuss your experiences with the course content delivery.
4. How did you pay for the final course (e.g., tuition voucher from hosting an intern, tuition voucher from your school, out-of-pocket, other scholarship, grant/loan)? Was paying for the final course a concern?

SPED Graduate Certificate Coursework Reflection

1. How was the progression of the SPED grad cert coursework? Did courses build on one another and connect or were courses disconnected or seemingly out-of-sequence?
2. Did any particular course or specific course content strike you as particularly novel, essential, or helpful?
3. As an already certified teacher, how did the coursework align with your experiences in the classroom?

Effect on Teaching (in SPED setting and/or GenEd setting)

1. Since completing the SPED grad cert, what teaching position(s) have you held?
2. Please discuss how the content from the SPED grad cert has influenced your instruction.
3. Are there any specific course projects, information, or experiences that have been helpful (e.g., IEPs, classroom management systems, assessment understanding, knowledge of SPED laws and terminology, differentiation, etc.)?
4. Did your learning from the SPED grad cert influence relationships with other education professionals (e.g., other teachers, co-teachers, school psychologists, guidance counselors, administrators, etc.)?

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Extending Doctoral Degree Opportunities to Nondoctoral School Psychologists

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Abstract

Doctoral-level school psychologists are critical for addressing the school psychologist shortage in the United States. Candidates especially qualified to pursue doctoral training in school psychology are among working, nondoctoral school psychologists. However, pursuing a doctoral degree is often precluded for these working professional. This pilot study is an initial step in examining the prospect of extending opportunities for doctoral training in school psychology to nondoctoral school psychologists with a master's-plus degree in school psychology who are currently working in public schools. Based on finding from the study, a doctoral program structure amenable to working school psychologists is presented.

Keywords: school psychology, psychologist shortage, adult learners, doctoral degree.

Extending Doctoral Degree Opportunities to Nondoctoral School Psychologists

There is a shortage of school psychologists in public schools across the United States that is at a crisis level (National Association of School Psychologists [NASP], 2022a, b). Although the NASP recommended ratio of students to school psychologists is 1 to 500, the national student to school psychologist ratio is thought to be around 1 to 1200 (NASP, 2022a, b). The shortage is compounded by the number of school psychologists who have and will continue to retire (Castillo et al., 2014). Meanwhile, childhood mental health continues to suffer in the United States. In 2013, the Centers for Disease Control and Prevention estimated that 13-20% of school-age children presented with mental disorders. Almost a decade later, those numbers have surged due to the COVID-19 pandemic (NASP, 2022c). The U.S. Surgeon General declared the current state of childhood mental health as being "unprecedented," "uniquely hard to navigate," and "devastating" (Office of the Surgeon General, 2021). The American Academy of Pediatrics (AAP) and the American Academy of Child and Adolescent Psychiatry (AACAP) have declared "a National State of Emergency in Children's Mental Health" (AAP, 2021).

Increasing Doctoral Program Offerings to Address Shortages

NASP (2021a, b) supports the critical need for more school psychologists, including doctoral-level school psychologists, to address mental health and other psychological issues pertaining to children and adolescents. Although the shortage of school psychologists can be addressed more immediately by master's-plus programs (e.g., Ed.S., CAGS, CAS, etc.), which provide the entry level degree in school psychology, the "pipeline" of school psychologists is ultimately produced via doctoral-trained (i.e., Ed.D, Ph.D., or Psy.D.) school psychologists in both university and field settings. Doctoral-level school psychologists are largely trained by doctoral-level school psychologists in both the graduate classroom and public school settings and, therefore, are an

essential component to continuation of the production of school-psychologists. Furthermore, given the increasing complexity of school-based psychological services and the need for expert understanding of an ever-evolving field, doctoral-level school psychologists are also needed as practitioners and leaders in today's schools in addition to being a necessary element for supervising doctoral field experiences. For example, doctoral-level school psychologists are uniquely qualified for writing grants and leading various research initiatives in public schools. Some school systems also may require school psychologists to have a doctoral degree in order to serve as directors/coordinators of psychological services. However, from 1995 to 2020, the number of doctoral degrees awarded in school psychology in the United States has steadily declined by about 10%, while master's-plus degrees in school psychology have steadily risen, accounting for nearly 70% of school psychology degrees awarded to recent graduates and is the degree held by the majority of school psychologist in the United States (Goforth et al, 2021).

Nondoctoral School Psychologists are an Untapped Pool

As a result, it stands to reason that increasing the number of doctoral-level school psychologists is critical to addressing the school psychologist shortage, not to mention providing an increased level of needed school psychology expertise to public schools. Candidates who are especially qualified to pursue doctoral training in school psychology are among the nondoctoral school psychologists with a master's-plus degree who currently work in public schools. However, pursuing a doctoral degree is often precluded for many working school psychologists due to various reasons, such as family, career, financial, and geographic constraints. Furthermore, after earning a master's-plus degree in school psychology, the prospect of working toward a doctorate is considerable given the additional time for completion of a degree that almost invariably will not fully recognize credit for a previously earned master's-plus degree. While NASP-approved nondoctoral programs in school psychology typically require an equivalent of three years of full-time study for a total of approximately 60 semester credit-hours, NASP-approved doctoral programs require five to seven years of full-time study totaling at least 90 semester credit-hours, including a full-time internship spanning at least ten months and a dissertation (NASP, 2020).

Dearth of Advanced Standing Doctoral Options

Of the approximately 83 doctoral programs in school psychology out of roughly 250 total school psychology programs in the United States, most of which are housed in colleges of education (Gadke, Valley-Gray, & Rossen, 2021), we identified only two programs that conspicuously promote an "advanced standing" option that will give credit for a year or more of full-time study for students who possess a master's-plus school psychology degree. There are, however, several other graduate school psychology programs identified that mention in handbooks and other materials that there may be consideration for an undetermined number transfer credits for students who hold a master's-plus school psychology degree and other degrees from allied fields.

Purpose and Method

Therefore, the purpose of this pilot study is to ascertain insights into the interest in, obstacles to, and value of obtaining a doctoral degree as perceived by nondoctoral school psychologists with a master's-plus degree in school psychology. Furthermore, another aim of the study is to present a viable school psychology doctoral program structure that is amenable to working, nondoctoral school psychologists. Participants are nondoctoral school psychologists who are currently

working or recently worked in a Mid-Atlantic region of the United States. The region from where the participants were drawn was specifically identified for its diverse public school settings, none of which met the NASP recommended ratio of students to school psychologists. Using an online survey platform, the participants completed a 10-item survey developed by the research team that was informed by focus groups and similar surveys. The survey consisted of open-ended, yes/no, and basic demographic questions. To obtain feedback on a suitable school psychology doctoral program structure amenable to working school psychologists, findings from the pilot study were presented to nondoctoral school psychologists, school psychology students in a nondoctoral program, and school psychology faculty at a national conference.

Results

Doctoral Degree Interest

There were 42 total participants, which represents more than 10% of the master's-plus school psychologists in the specific region under consideration (some respondents did not answer all questions). The group was roughly split between less than 10 years of experience working as a school psychologist (54.8%) and more than 10 years of experience (45.2%). Out of the total number of participants, 83% indicated a desire to pursue a doctoral degree of some kind. The remaining 17% who did not have a current desire to pursue a doctoral degree largely indicated that pursuing a doctoral degree is something that is a good idea for other colleagues to consider and/or may have been an interest earlier in their career. Nearly all of the participants with less than ten years of experience indicated an interest in pursuing a doctoral degree while approximately half of the participants with more than 10 years of experience indicated that they were not currently interested in pursuing a doctoral degree even though they may support the prospect for other colleagues and/or have been interested in doing so earlier in their career.

Reasons for Desiring to Purse Doctoral Study

Regarding reasons for wanting to pursue a doctoral degree, 81% of responses indicated wanting to pursue a degree that would have a concentration in or otherwise facilitate working in a supervisory and/or administrative capacity in a public school setting but not necessarily for becoming licensed in psychology. At the same time, however, psychology licensure was indicated as an interest in 75% of responses but not necessarily for purposes of leaving the public school setting.

Further illuminating the results highlighted above, themes from narrative responses generally suggest that career advancement of some sort is the primary reason for interest in pursuing a doctoral degree and time and cost are generally the obstacles to doing so. Some representative narrative responses regarding career advancement include:

- *To broaden my career options and prospects.*
- *Greater flexibility in my career with the potential for working in private practice and other settings.*
- *Opens up doors for additional opportunities- licensure, leadership, research, etc.*
- *Expand knowledge in the context of supervision/leadership.*

Some representative narrative responses regarding roadblocks to pursuing a doctoral degree include:

- *I love my job so taking a break from it to study would not be feasible with a family dependent on my income. Roadblocks to continuing education would be the hours classes are offered. I would be open to afterschool and summer classes.*
- *Availability of a program nearby, not being able to stop working to pursue a PhD/PsyD, cost.*
- *Key roadblocks are finances and time, with the benefits of having my Ph.D. not outweighing the cost.*
- *The time it would take to continue working full time and go back to school.*

Preference for an Advanced Standing Option

In terms of program structure, the narrative responses suggest that a doctoral program that allows credit for previous graduate coursework requiring two to three courses per semester, including the summer term, for an overall total of around 50 credit-hours is generally viable for working school psychologists. The findings from the pilot study along with subsequent discussion of the findings at a national conference suggest that the program structure generally desired for working school psychologists does not substantially differ from the program structure of a very small number of doctoral programs in school psychology that offer an "advanced standing" or similar option for working school psychologists. Additionally, discussion of the findings at the conference suggests that accommodating working school psychologists in a doctoral program could be accomplished via simultaneous matriculation options that accommodate both traditional as well as nontraditional, working students.

Discussion and Program Structure Implementation

As a result, the doctoral program structure outlined below is a general model for a doctoral program in school psychology that can appeal to a wide variety of qualified applicants and concurrently cater to the needs of working school psychologists. Similar to the very small number of advanced standing and similar types of school psychology doctoral programs, the model program structure presented below is generally aligned with American Psychological Association (APA) requirements as well as NASP, thereby satisfying regulations for working both inside (state department of education regulations) and outside (state psychology board regulation) of public schools systems. See www.APA.org and www.NASPonline.org for further information on state psychology licensure vs. working as a school psychologist in public school systems.

Although the structure below could be developed as a doctoral-only program, it is presented to work as an extension of an existing nondoctoral school psychology program, thereby making such a program amenable to existing nondoctoral school psychology programs that wish to expand their program to include doctoral study. Furthermore, although the structure is presented as a full-time sequence, it could be adapted for part time completion given fulfillment of residency requirements (e.g., APA requires at least one academic year of full-time study) and time to completion (e.g., most institutions have time restrictions on the maximum number of years allowed to complete various types of graduate degrees). As a result, we propose the

following general school psychology doctoral program structure with three matriculation options as indicated below:

- Traditional Entry: Full Five-Year Doctoral Program (approximately 114 total credit hours) – The full doctoral program can be considered as the base program and is not substantially different from a traditional doctorate program in school psychology in the United States. The program at this tier is generally targeted for students who do not possess a three-year degree in school psychology or do not have substantial transfer credits. Starting at this tier would be appropriate for qualified students straight out of or with some relevant experience after undergraduate studies. The first two years of this program would generally be the same as the first two full-time years of a three-year nondoctoral school psychology program.

- Transfer Entry: Four-Year Doctoral Program (approximately 84 total credit hours) – The Four-Year Program shares similarity with traditional school psychology doctoral programs in the United States that have transparent guidelines for transfer credits. The program at this tier is appropriate for students with graduate credits, other related masters degrees, or a nondoctoral school psychology degree or related degree that may have some outdated courses or courses that are no longer eligible for direct transfer (e.g., courses as part of a degree obtained more than 10 years prior to application) but may qualify for a waiver per APA, NASP, and specific university regulations. Students at this tier would take selected courses from years 1 and 2 of the Five-Year Program as deemed appropriate along with requirements for years 3 through 5 of the Five-Year Program.

- Advanced Standing Entry: Three-Year Doctoral Program (approximately 60 total credit hours) – The Three-Year Advanced Standing Program would be strictly offered only to qualified students with a nondoctoral school psychology degree from a NASP-approved program, generally obtained within 10 years of application. Such a program is unusual in the United States but could exist in alignment with NASP and APA regulations. These students would generally only take years 3 through 5 of the Five-Year Program.

Conclusions

Although opportunities for doctoral studies in school psychology that are amenable to working school psychologists with nondoctoral school psychology degrees are rare, the desire by nondoctoral school psychologists to pursue doctoral study and the need for more doctoral-level school psychologists are apparent. Therefore, continued exploration of the merits of doctoral-level study for working school psychologists, perhaps the most qualified pool of potential applicants for school psychology doctoral study, seems worthy of continued inquiry. We are hopeful that this pilot study will be a starting point to that end.

References

American Academy of Pediatrics (2021). National emergency in children's mental health. Retrieved from https://www.aap.org/en/advocacy/child-and-adolescent-healthy-mental-development/aap-aacap-cha-declaration-of-a-national-emergency-in-child-and-adolescent-mental-health/

Castillo, J. M., Curtis, M. J., & Tan, S. Y. (2014). Personnel needs in school psychology: A 10-year follow up study on predicted personnel shortages. *Psychology in the Schools*, 51, 832–849. https://doi.org/10.1002/pits.21786

Centers for Disease Control and Prevention. (2013). Youth risk behavior surveillance: United States, 2005–2011. *Surveillance Summaries, MMWR*, 62(02), 1–35. https://pubmed.ncbi.nlm.nih.gov/24918634/

Goforth, A. N., Farmer, R. L., Kim, S. Y., Naser, S. C., Lockwood, A. B., & Affrunti, N. W. (2021). Status of School Psychology in 2020: Part 1, Demographics of the NASP Membership Survey. NASP Research Reports, 5(2). file:///C:/Users/srush/AppData/Local/Temp/2021%20NASP_2020%20Membership%20Survey-1.pdf

Gadke, D. L., Valley-Gray, S., & Rossen, E. (2021). NASP Report of Graduate Education in School Psychology: 2018–2019 [Research report]. National Association of School Psychologists. file:///C:/Users/srush/AppData/Local/Temp/NRR_SP_Grad_Ed_Report_2018-2019.pdf

National Association of School Psychologists (2022a, May 27). *Shortage of school psychologists*. https://www.nasponline.org/research-and-policy/policy-priorities/critical-policy-issues/shortage-of-school-psychologists

National Association of School Psychologists (2022b, May 27). *Shortages in school psychology resource guide*. https://www.nasponline.org/resources-and-publications/resources-and-podcasts/school-psychology/shortages-in-school-psychology-resource-guide

National Association of School Psychologists (2022c, May 27). *Helping children cope with changes resulting from COVID-19*. https://www.nasponline.org/resources-and-publications/resources-and-podcasts/school-climate-safety-and-crisis/health-crisis-resources/helping-children-cope-with-changes-resulting-from-covid-19

National Association of School Psychologists (2020). 2020 NASP standards for graduate preparation of school psychologists. https://www.nasponline.org/standards-and-certification

Office of the Surgeon General Protecting (2021). *Youth mental health: The U.S. Surgeon General's advisory.* Retrieved from https://www.hhs.gov/sites/default/files/surgeon-general-youth-mental-health-advisory.pdf

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Author Note

The data collection employed in this pilot study was approved by the Institutional Review Board for the Protection of Human Subjects at Towson University (protocol #1639) as Exempt Status on Thursday, December 9, 2021.

The data set used in this study is available upon reasonable request to the corresponding author.

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Levels of Telepractice Being Used By Speech-Language Pathologists Before and During the COVID-19 Pandemic in Oklahoma and Texas K-12 Schools

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Abstract

This study compared the different services and types of disorders Oklahoma and Texas K-12 SLP's provided through teletherapy as compared to face-to-face therapy before and during the COVID-19 pandemic. A Google forms survey was available to SLPs from June through October, 2021, assessing three age groups of children: elementary (5-10 years), middle school (11-13 years), and high school (14-18 years). Questions included types of serviced provided and disorders treated. There was a decrease in the services of Screening, Assessment, and Follow-up offered through teletherapy as compared to face-to-face for all three age groups. However, there was a decrease in treatment of disorders with elementary and middle school students while no change or an increase in treatment was observed in treatment in high school students. This study concludes that services and treatment decrease for younger aged students while most treatment remained the same for older students.

KeyWords: Telepractice/Teletherapy, COVID-19, Oklahoma & Texas K-12 schools, Services & Treatments

Levels of Telepractice Being Used By Speech-Language Pathologists Before and During the COVID-19 Pandemic in Oklahoma and Texas K-12 Schools

Selecting an effective service delivery option for students with special needs is an important aspect of school-based speech-language pathology (Cirrin *et al.*, 2010). Speech language pathologists (SLPs) serve on collaborative teams with other professionals to help develop Individual education plans (IEPs) for students with special needs. According to the American Speech-Language-Hearing Association (ASHA), a service delivery model determines the setting, format (individual or group), and provider of the service that is delivered at a specified dosage (frequency, duration, intensity) (ASHA, 2021). Examples of delivery models commonly used in public school settings include; pull-out, telepractice, classroom consultation, and in-classroom collaboration (Grogan-Johnson, 2018). Traditionally, when students receive SLP services in schools the location of which they receive individualized intervention services is outside of their regular or special education classroom (Cirrin *et al*., 2010). This service delivery option is referred to as the pull-out model, and in an ASHA survey performed in 2008 it was found to be the most prevalent service delivery model utilized by clinicians in elementary schools. When selecting a delivery model, it is imperative that the SLP considers the unique and ever-changing needs of the student.

The COVID-19 pandemic caught the world by surprise, and forced the quick adaptation of society. Two major aspects of society that had to adapt to adequately meet the needs of their students and patients were schools and medical professionals. SLPs fall under both of these categories, with 55.9% of SLP's being employed in a school setting and 38.8% being employed in healthcare settings (at a glance). Thus, it was imperative that they find proper resources and evidence-based practices that would allow them to meet these needs. Most schools across the country switched to distance learning to face the challenges of COVID-19.

With the closure of schools and the switch to distance learning, the U.S Department of Education (USDE) ensured parents that their children would still receive a free appropriate public education (FAPE), this included children with disabilities (ASHA, 2021). Speech and language disorders are ranked as the second most common disability for which children receive services in U.S schools. USDE has stated that FAPE may include special education and other affiliated services to be provided through distance instruction, specifically speech or language services being provided through video conferencing, also known as teletherapy.

ASHA defines telepractice as using telecommunications technology for the delivery of speech language pathology at a distance by connecting the clinician to their client or a clinician to another clinician (ASHA, 2021). Teletherapy can be exercised through assessment, intervention, and or consultation. Additional terms other than telepractice that are also used by practitioners include teleaudiology, telespeech, and speech teletherapy. Clinicians must follow the Code of Ethics, Scope of Practice in Audiology, Scope of Practice in Speech-Language Pathology, state and federal laws, ASHA policy, and must be equivalent to the quality of services provided in person in order to offer speech teletherapy. Teletherapy practice was not as prevalent in certain areas of the world as in the United States, with 57% of the U.S. practicing teletherapy in a 2016 ASHA survey (Fairweather, *et al.,* 2016; ASHA, 2021; Fong, *et al.* 2021; Rettinger, *et al.,* 2021)

Teletherapy is a great tool and service delivery model because it allows SLP's to carry most other service delivery methods with telecommunication technologies. This makes teletherapy a great candidate for school districts that do not have access to an in-person SLP (Fairweather, *et al.,* 2016; Grogan-Johnson, 2018). School telepractice experts claim there are many advantages to the utilization of telepractice in the school setting (Bryant, Parafiniuk, & Sippl, 2017). One major advantage is being able to serve students who are not able to attend school on campus due to various reasons. Additionally, most school-aged children are very comfortable with technology. This motivates them to engage and participate well during their session. Studies have even shown that students have been able to accomplish more in less time. SLPs were asked how they determine which students are appropriate to be served via telepractice, and they agreed that almost all students can be served through telepractice. When it comes to the bottom line, teletherapy can also save rural school districts money for travel costs or through contracting an SLP out to provide teletherapy.

There are many challenges an SLP might face when providing services virtually through teletherapy. Some of these challenges can include state laws, regulations, access to technology, the local school districts' policies, and the students' ability to use teletherapy (Sylvan, *et al.,* 2020; ASHA, 2021). Some challenges that SLPs need to address when utilizing teletherapy are

making sure the student has the resources or even an aid if needed to help them access the SLP over telecommunication. Some SLPs noted that there were insufficient guidance and planning, inconsistency and disorganization, and unclear or unrealistic expectations from school districts (Sylvan, *et al.,* 2020). Additionally, greater than 50% stated that they didn't have enough time and were not allowed to have input in this transition to teletherapy. This made transitioning to teletherapy more difficult, however, SLPs were able to adapt to this new way of therapy with the assistance of their SLP community. SLPs need to have a good understanding of the technologies needed to conduct teletherapy, and have adequate training and resources to engage students.

Teletherapy is most commonly utilized in the school setting over all of the other settings (Rudolph & Rudolph, 2015). Despite this fact, it is remarkable that in a scholarly forum it was found that there were no reviews that discussed if teletherapy in school settings was an equivalent source of therapy, one equal to face-to-face services. In fact, in a systematic review and meta- analysis review of literature related to the effectiveness of teletherapy with school aged children, it was found that there were only six articles that qualified for the review. In conclusion of her study, Rudolph found that there was uncertainty if telepractice was equivalent to face-to-face therapy. Additionally, she noted that this uncertainty was explained by the fact that there was not an adequate amount of research pertaining to teletherapy in school settings available to answer her research question. SLP's, Occupational Therapists, and Physical Therapist who were surveyed in Austria also had approximately 55% agree that there was not enough research evidence for teletherapy at this time across the disciplines, however, greater than 75% were interested in teletherapy (Rettinger, *et al,* 2021).

The purpose of this study was to evaluate the percent of time K-12 SLP's in the Oklahoma and Texas area utilized teletherapy as a delivery model before the COVID-19 pandemic as compared to the percentage of time they utilized teletherapy as a delivery model during the current COVID-19 pandemic. Additionally, the study compared the different services SLP's provided through teletherapy compared to what they are able to provide with face-to-face therapy. There are many differing opinions and studies on the effectiveness of teletherapy and if it is suitable for most students on a school SLP's caseload. Furthermore, the study inquired on what age groups and disorders the SLP's were able to provide effectively through teletherapy.

It is hypothesized that SLPs opinion on teletherapy will be positive, that they find teletherapy is as effective as face-to-face therapy and will likely keep this practice after the COVID-19 pandemic is over. The results of this study will provide insight to the direction that speech language therapy may be heading in the future. Research will be conducted by surveying K-12 SLPs to assess their opinions on the effectiveness of teletherapy to examine how likely they are to continue to use teletherapy after the pandemic. Factors that are considered include SLPs' caseloads, which includes clients' ages, disorder type, and therapy techniques. The survey will be split up according to the average age groupings in elementary, middle, and high schools.

Methods

A questionnaire was developed in order to survey practicing K-12 school SLP's in Oklahoma and Texas (Appendix 1). This questionnaire consisted of five sections that included a consent

page, background (demographic) information, and three succeeding sections organized according to the average age students in schools are broken up into. These sections included the age ranges 5-10 years (elementary), 11-13 years (mid-school), and 14-18 years (high school). Within each age group section, there were identical questions pertaining to what services they have offered to that age group through teletherapy and through face-to-face therapy. Additionally, within each age group section there were identical questions referring to what kind of disorders the SLP has effectively provided through face-to-face therapy or through telepractice. In total, the survey had 22 questions and took the participants approximately 6 minutes to complete.

The survey was a digital Google form and was distributed through email and a Facebook group consisting of school based SLPs. The data was collected from 6/17/2021 through 10/3/2021. To protect anonymity, results were kept confidential. The survey was approved by Northeastern State University Institutional Review Board (Reference No. 21-059R).

Results

Demographic/Background

A total of 20 SLPs responded to the survey, 3 responses were eliminated because they were not certified SLPs. One response was thrown out because they had not provided services through telepractice and an additional 3 were thrown out because they did not provide services to students in the Oklahoma or Texas region. After analyzing our responses, only 13 qualified to meet study criteria.

All of the surveyed SLPs have provided services through telepractice (Table 1). The SLPs only used telepractice 0-25% of the time prior to COVID-19 pandemic. However, the percentage of telepractice increased during the pandemic with 15% of SLPs utilizing this practice 50-75% of the time, 62% practicing 25-50%, and 23% practicing 0-25% of the time. None of the SLPs surveyed practiced teletherapy 100%.

Table 1
Pre- and During COVID-19 teletherapy practices

Question	Percent of Time			
	0-25%	**25-50%**	**50-75%**	**75%-100%**
Before the COVID-19 pandemic how often did you use telepractice?	100%	0	0	0
Since the COVID-19 pandemic how often did you use telepractice?	23%	62%	15%	0
	Yes	**No**		
Have you provided services through Telepractice?	100%	0		

Use of Telepractice in 5-10 year olds

There was a considerable decrease in the percent of participants who provided the service of a screening, assessment, and follow up/ monitoring service through teletherapy in the age range 5-10 years (Table 2). Treatment services was the only service that respondents noted an 8% increase in from face-to-face service delivery models to teletherapy.

Table 2

Services provided to children ages 5 - 10 years

Services provided[a]	Face-to-Face	Teletherapy	% change
Screening	92%	8%	↓83%
Assessment	92%	58%	↓33%
Treatment	92%	100%	↑8%
Follow up/ monitoring	92%	50%	↓42%

[a]Percentages based off 12 survey participants

There is an array of disorders that a SLP may treat when providing services. Participants were given a list of common disorders associated with Speech therapy in order to discern what treatments they felt they could effectively provide through teletherapy as compared to face-to-face service delivery models to 5-10 year old students (Table 3). The respondents felt that only Speech Sound disorders could effectively be treated equally.

Table 3

Types of disorders effectively treated for the age range 5 - 10 years

Type of Disorders[a]	Face-to-Face	Teletherapy	% change
Aphasia/ Coginitive	25%	0%	↓25%
Developmental Lang	100%	75%	↓25%
Dysphagia/feeding	17%	0%	↓17%
Fluency	92%	33%	↓58%
Hearing Impairment	58%	8%	↓50%
Literacy	42%	25%	↓17%
Motor Speech	67%	42%	↓25%
Multimodal Comm (AAC)	67%	8%	↓58%
Social Communication	67%	25%	↓42%
Speech Sound	100%	100%	0%

[a]Percentages based off 12 survey participants

Use of Telepractice in 11-13 year olds

There was a sizable decline in the percentage of SLP's who provided the service of a screening, assessment, and follow up/monitoring service utilizing teletherapy to students ages 11-13 years (Table 4). Treatment was the only service SLP's reported they offered through teletherapy compared to the face-to-face counterpart equally.

Table 4

Services provided to children ages 11 - 13 years

Services offered[a]	Face-to-Face	Teletherapy	% change
Screening	75%	13%	↓63%
Assessment	88%	38%	↓50%
Treatment	100%	100%	0
Follow up/ monitoring	88%	38%	↓50%

[a]Percentages based off 8 survey participants

There was a decrease in the percent of participants who felt they could effectively treat the disorders of Aphasia/Cognitive, Dysphagia/feeding, Fluency, Hearing impairment, Literacy, Motor Speech, Multimodal Communication, and Social Communication using teletherapy as a service delivery model in the age range 11-13 years (Table 5). There was no change in the percent of SLP's who use face-to-face therapy or teletherapy to treat Developmental language or Speech Sound disorders.

Table 5

Types of disorders effectively treated for the age range 11 - 13 years

Type of Disorders[a]	Face-to-Face	Teletherapy	% change
Aphasia/ Coginitive	13%	0	↓13%
Developmental Lang	88%	88%	0%
Dysphagia/feeding	13%	0	↓13%
Fluency	50%	38%	↓13%
Hearing Impairment	63%	13%	↓50%
Literacy	25%	13%	↓13%
Motor Speech	63%	50%	↓13%
Multimodal Comm (AAC)	50%	0	↓50%
Social Communication	75%	38%	↓38%
Speech Sound	100%	100%	0%

[a]Percentages based off 8 survey participants

Use of Telepractice in 14-18 year olds

There was an observable decrease in the percentage of SLP's who provided the service of a screening, assessment, and follow up/monitoring service through teletherapy as compared to face-to-face therapy in the age range 14-18 years (Table 6). Treatment services was the only service that respondents reported no change from the service delivery model face-to-face as compared to teletherapy.

Table 6

Services provided to children ages 14 - 18 years

Services offered[a]	Face-to-Face	Teletherapy	% change
Screening	75%	0%	↓75%
Assessment	75%	0%	↓75%
Treatment	100%	100%	0%
Follow up/ monitoring	100%	75%	↓25%

[a]Percentages based off 4 survey participants

There was no change in the percent of respondents who use face-to-face therapy or teletherapy to treat Aphasia/ Cognitive disorders, Developmental language disorders, Dysphagia/ feeding, Fluency disorders, Literacy, Motor Speech disorders, Social Communication disorders and Speech Sound disorders in the age range 14-18 years (Table 7). There was a 25% increase in the number of respondents who used teletherapy to treat students with hearing impairments and a 50% increase in Multimodal Communication or an augmentative and alternative communication (AAC) devices.

Table 7

Types of disorders effectively treated for the age range 14 - 18 years

Type of Disorders[a]	Face-to-Face	Teletherapy	% change
Aphasia/ Coginitive	0%	0%	0%
Developmental Lang	75%	75%	0%
Dysphagia/feeding	0%	0%	0%
Fluency	75%	75%	0%
Hearing Impairment	25%	50%	↑25%
Literacy	25%	25%	0%
Motor Speech	50%	50%	0%
Multimodal Comm (AAC)	0%	50%	↑50%
Social Communication	50%	50%	0%
Speech Sound	75%	75%	0%

[a]Percentages based off 4 survey participants

Discussion

The results of this survey depict that the COVID-19 pandemic has impacted Speech- Language Pathology service delivery in Oklahoma and Texas. Survey results show a quick emergence of teletherapy with 77% of respondents increasing their use of teletherapy during the pandemic. Results also offer further possible insights into what services SLP's utilize teletherapy to provide, and to what clinical populations.

When analyzing the data from three average age groups together, it was found that there was a decrease in the services of Screening, Assessment, and Follow-up offered through teletherapy as compared to face-to-face. However, there was no change or slight increase of 8% when it came to treatment being offered through teletherapy. These results show that treatment was not affected by moving to teletherapy.

Types of disorders that respondents frequently use teletherapy for include Speech Sound disorders, in all age ranges there was no change in the amount of SLP's who offered it through teletherapy as compared to face-to-face. Additionally, while the age ranges 5-10 and 11-13 showed mostly declines in the amount of disorders SLP's treated through teletherapy the age range 14-18 showed only no change or increases. In fact, respondents reported the exact opposite results for 8 out of 10 disorders in the age range 14-18 as compared to 5-10 and 11-13. This study concludes that while teletherapy is just as useful and effective as face-to-face in the 14-18 age group, it is probably not as beneficial for the age ranges 5-10 and 11-13.

Limitations

This study is not without limitations. While this survey has provided some insights into the possible future of teletherapy as a delivery service model in speech therapy, future research needs to be conducted using a larger sample of SLP's to validify these results. This was an undergraduate SLP honors research student's project which had limits regarding the time length that the survey would be available for participants.

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Data Availability Statement

All data is available by emailing Dr. Sallie Ruskoski ruskosks@nsuok.edu.

References

American Speech-Language-Hearing Association. (n.d.) ASHA Practice Portal: Telepractice. Retrieved November 18, 2021, from https://www.asha.org/practice-portal/professional-issues/telepractice/

Bryant, C., Parafiniuk, D., & Sippl, T. (2017). Telepractice in schools: What works best? *The ASHA Leader, 22*(7). doi:10.1044/leader.ov.22072017.npS

Cirrin, F. M., Schooling, T. L., Nelson, N. W., Diehl, S. F., Flynn, P. F., Staskowski, M., Torrey, T. Z., & Adamczyk, D. F. (2010). Evidence-based systematic review: effects of different service delivery models on communication outcomes for elementary school-age children. *Language, speech, and hearing services in schools*, *41*(3), 233–264. https://doi.org/10.1044/0161-1461(2009/08-0128)

Fairweather, G. C., Lincoln, M. A., & Ramsden, R. (2016). Speech-language pathology teletherapy in rural and remore educaitonal settings: Decreasing service inequities. *International Journal of Speech-Language Pathology, 18*, 592-602. doi:10.3109/17549507.2016.1143973

Fong, R., Fung Tsai, C., & Yan Yiu, O. (2021). The implementation of telepractice in speech language pathology in Hong Kong during the COVID-19 pandemic. *Telemedicine and e-Health, 27(1)*, 30-38. doi: 10.1089/tmj.2020.0223

Grogan-Johnson, S. (2018). Getting started in school-based speech-language pathology telepractice. *Perspectives of the ASHA Special Interest Groups, 3*(18), 21-31. doi:10.1044/persp3.sig18.21

Rettinger, L., Klupper, C., Werner, F., & Putz, P. (2021). Changing attitudes towards teletherapy in Austrian therapists during the COVID-19 pandemic. *Journal of telemedicine and telecare, 0(0),* 1-9. doi:10.1177/1357633X20986038

Rudolph, J. M. & Rudolph, S. (2015). Telepractice vs. on-site treatment: are outcomes equivalent for school-age children? *EBP Briefs, 10(2),* 1-15. Bloomington, MN: NCS Pearson, Inc.

At a Glance: Where do audiologists and speech-language pathologists work? (2014, May 1). *The ASHA Leader, 19*(5), 24-24. doi:10.1044/leader.aag.19052014.24

Sylvan, L., Goldstein, E., & Crandall, M. (2020). Capturing a moment in time: A survey of school-based speech-language pathologists' experiences in the immediate aftermath of COVID-19 public health emergency. *Perspectives of the ASHA Special Interest Groups, 5,* 1735-1749. https://doi.org/10.1044/2020_PERSP-20-00182

Evaluating Emergent Bilinguals for Specific Learning Disabilities: Considering Second Language Development and Culture

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Abstract

Evaluating students from culturally and linguistically diverse backgrounds (i.e., emergent bilinguals) presents challenges to evaluation teams, as distinguishing between a language disorder and typical second language development is more complex. The skills and knowledge required to do this task often exceed the level of training that evaluators (e.g., educational diagnosticians, LSSPs, speech pathologists) possess. To conduct a nondiscriminatory evaluation, evaluators must determine native language proficiency to select tests, understand the impact of culture on the learner, and interpret results. This requires an understanding of typical second language development and the influence of culture. This paper aims to add to evaluators' knowledge base by describing typical second language development and considering cultural implications. Implications for test selection and interpretation will also be discussed.

Evaluating Emergent Bilinguals for Specific Learning Disabilities: Considering Second Language Development and Culture

The demographics of students in public schools continue to change drastically. Data from the National Clearinghouse for English Language Acquisition (NCELA) reveal that California, Texas, Florida, New York, and Illinois have the highest numbers of Spanish-speaking English learners (NCELA, 2020). This same data revealed that 74.82% of English learners across the Unites States speak Spanish as a first language. Furthermore, this unique population of culturally and linguistically diverse (CLD) students is the fastest-growing student group in schools today. According to the Texas Educational Agency (TEA), over 120 languages are spoken in Texas public schools, with 90% speaking Spanish. Texas has experienced a 20% growth in the number of students served in special education since 2017-18, with most of that growth in the specific learning disability (SLD) category. Since SLD is a language-based disability, separating language disability and second language learning is challenging (Golloher et al., 2018; Stephens et al., 2022; Wagner et al., 2005)

To exacerbate the challenges of evaluating emergent bilinguals (EB), particular education referral sources (i.e., general education) lack adequate preparation and efficacy in teaching with EB (Durgunoğlu & Hughes, 2010; Lopez & Santibanez, 2018; Samson & Collins, 2012). This lack of understanding of second language acquisition may result in disproportionate referrals to special education. Ultimately, the responsibility of unique education identification falls on the group of qualified professionals, with the educational diagnostician or school psychologist in the primary role. For this reason, it is critical that evaluating students from CLD backgrounds requires an understanding of normal second language development and the cultural implications

of the examinee. Second language and cultural considerations must occur throughout special education evaluations (Ortiz & Oganes, 2022). The purpose of this article is to describe typical second language acquisition and the cultural implications of EBs. This foundational knowledge will assist evaluators in test selection, interpretation, and consideration of exclusionary factors.

Second Language Development

The student's second language development is critical to evaluating an emergent bilingual for SLD. Learning a second language can influence the acquisition of other academic skills. Evaluators must know the difference between language development and a learning disability when working with an emergent bilingual. For example, an emergent bilingual may struggle with spelling because they have yet to learn the spelling rules in English. Language development may be the issue and not necessarily a sign of a learning disability.

Suppose an examiner suspects that an emergent bilingual might have an SLD. In that case, they must conduct a comprehensive evaluation that considers the student's level of proficiency in both first and second languages. Evaluators must consider the student's language of instruction, their level of proficiency in that language, and their socio-cultural background.

Emergent bilinguals require careful evaluation when attempts are being made to identify the presence of a specific learning disability. Evaluators must be aware of cultural differences in language and learning styles and be sensitive to the student's socio-cultural background. Evaluators must also understand the student's second language development, which can influence their acquisition of academic skills. Evaluators must use appropriate testing instruments and methods and be cautious not to confuse language development issues with the presence of a learning disability. In order to accomplish this, the examiner must understand typical second language development.

Typical Second Language Development

To be able to distinguish normal second language development from SLD requires an understanding of typical first language development and the manifestations of SLD. Typical first language development requires an understanding of the five language domains as defined by the American Speech-Language Hearing Association (ASHA). Descriptions of the five oral language domains are as follows:

- *Phonology*—study of the speech sound (i.e., phoneme) system of a language, including the rules for combining and using phonemes.

- *Morphology*—study of the rules that govern how morphemes, the minimal meaningful units of language, are used in a language.

- *Syntax*—the rules that pertain to the ways in which words can be combined to form sentences in a language.

- *Semantics*—the meaning of words and combinations of words in a language.

- *Pragmatics*—the rules associated with the use of language in conversation and broader social situations (p.1).

It is important to note that these domains develop on a continuum which spans to higher order thinking. These higher order language skills are critical for students to engage in academic discourse. For EBs this is often referred to as cognitive academic language proficiency (CALP) which will be discusses later in this article. Oral language predicts written language (Metsala et al., 2021) including students who are learning a second language. (Francis et al., 2019; Miller et al., 2006; Rodriguez et al., 2021). The co-morbidity of language disorders and SLD are well documented (Fuchs et al., 2019; Snowling et al., 2021).

Understanding typical (and atypical) first language development combined with understanding typical second language development provide the underpinnings of diagnostically precise decisions for EBs. For example, consider an EB who struggles with the syntactical aspects of English. We can assess the learners' syntactical understanding in both languages to determine if it's a syntax issue in both languages which is suggestive of a disorder or is the challenged related to one of the stages of second language development or perhaps culture.

Emergent bilinguals often come from diverse backgrounds including limited formal schooling and low socioeconomic backgrounds (Garcia et al., 2008). These factors can inhibit first and second language development. Moreover, emergent bilinguals go through the language acquisition process at different rates as well as different stages (Cummins, 1984). Cummings (1984) describes basic interpersonal communication skills (BICS) as the basic language skills students need to interact in social settings. These daily social skills include word order, morphological, phonological, and vocabulary skills. Most EBs will acquire BICS in 2 years whereas cognitive academic language proficiency (CALPS) takes longer due to the academic demand and reduced context.

Steven Krashen and Tracey Terrell (1983) identified five stages of second language acquisition while expert language teacher, Judie Haynes (2007), provided detailed characteristics of each stage and explained how each stage might affect instruction. The first stage is preproduction. During this stage (0-6 months) characteristics include a silent period where students may be reluctant to talk as they begin to understand English when they hear it but are not ready to speak. They may also repeat words and know up to 500 words. In addition, by the end of the day, most EBs in this stage are exhausted due to listening to English all day. The second stage is early production. During this stage, students may know up to 1,000 words as they not only understand English but can also write and speak in short sentences using one or two-word phrases. The third stage is speech emergence. Students know up to 3,000 words and begin to initiate speech and produce questions as comprehension begins to increase. In addition, they begin to write brief stories and paragraphs. Intermediate fluency is the fourth stage where students know about 6,000 words and begin producing more complex sentence structure and initiate questions. During the final stage, advanced fluency, students are near-native ability in English but still developing academic language proficiency. This stage can take 5-7 years or more to fully develop. See Table 1

Table 1
Stages of Second Language Development

Stage 1: Silent/Pre-production	Characteristics include a silent period where students may be reluctant to talk as they begin to understand English when they hear it but are not ready to speak. They may also repeat words and know up to 500 words	May last ~ 0-6 months
Stage 2: Early Production	Students may know up to 1,000 words as they not only understand English but can also write and speak in short sentences using one or two-word phrases.	Can continue ~6 months after stage 1
Stage 3: Speech emergence	Students know up to 3,000 words and begin to initiate speech and produce questions as comprehension begins to increase. In addition, they begin to write brief stories and paragraphs.	Can last up to a year after stage 2
Stage 4: Intermediate Fluency	Students know about 6,000 words and begin producing more complex sentence structure and initiate questions.	Can take another year after stage 3
Stage 5: Advanced Fluency	Students are near-native ability in English but still developing academic language proficiency	Can require 5-7 years to gain proficiency

Typical second language characteristics, if not understood, can lead to falsely identifying students as disabled; therefore, it is incumbent on the examiner to understand some common manifestations of second language acquisition that may be misinterpreted. For example, when children are learning two languages, it may be characterized by distributed skills and uneven abilities. An EB may perform better on some tasks in one language and better on another task in a different language (Kohnert, 2010). Cross-linguistic transfer and interference are standard for EBs but may appear as vocabulary or syntax errors (Lago et al., 2020) which may be mistakenly attributed to a disorder. Examiners must also know that bilingualism is a risk factor for disfluencies such as repetitions, interjections, and unfinished words (Byrd et al., 2015). These students' characteristics underscore the importance of a multidisciplinary approach when evaluating this population. To equitably serve EB students, it is important to understand common behaviors and characteristics that might be mistaken as a learning disability or language disorder (Mostovoy-Luna, E. (2019).

- Transfer from Primary language: Understanding communication differences impacted by the grammar or syntax of the student's first language will help understand how this may affect second language acquisition.

- Language Loss or Subtractive Bilingualism:Depending on the program of instruction offered, some students may experience a loss of their first language. This is especially true for students in transitional bilingual programs, which tend to have a "language-as-a-problem" connotation, or "subtractive bilingualism" as it takes away from the student's culture and identity (Wright, 2010).

- Additive Bilingualism: Additive bilingualism allows students to learn a second language while maintaining their first language. In addition, the student's culture is also valued and maintained.

- Codeswitching: Codeswitching is the changing of language between or across phrases and should not be considered a language disorder. In some cultures, codeswitching is used to express feelings and emotions.

- Fossilization: This is when specific language errors reoccur regardless of proficiency in the second language.

Cultural Considerations

Many assessments commonly used to evaluate specific learning disabilities (SLD) have been developed and normed on populations of students who are proficient in English as their first language. These tests are not necessarily appropriate or valid for use with emergent bilinguals. An evaluator must select appropriate testing instruments and methods sensitive to cultural differences in language and learning styles.

When evaluating an emergent bilingual for SLD, it is essential to consider that the student may have had limited exposure to academic English and may need help with the language demands of the tests. Evaluators should consider students' culture when examining their communication and behavior in the classroom (Kirova & Henning, 2013). Emergent bilinguals may also need help with the cultural norms underlying many tests. For example, a student from a culture where eye contact with authority figures is considered disrespectful may seem evasive or withdrawn during an evaluation. It is essential for an examiner working with an emergent bilingual to have some knowledge of the student's cultural background and to respect the student's perception and their way of identifying with others in their school environment (Nortvedt et al., 2020).

Evaluators must understand that cultural differences can also affect how emergent bilinguals learn. Teachers and evaluators must be aware that the cultural background of students may affect their learning style. For example, students from cultures that place a high value on collectivism may be more collaborative learners and work better in group settings. In contrast, students from individualistic cultures may be more independent in their learning styles. Therefore, teachers and evaluators must approach teaching and evaluation in a way sensitive to the student's cultural background. When testing an emergent bilingual student for specific learning disabilities, evaluators must be aware of cultural considerations.

Evaluators should consider the student's level of proficiency in their primary language and English. It is important to remember that English proficiency does not necessarily indicate cognitive ability. Additionally, some students may experience language anxiety, affecting their assessment performance.

Different cultures may have different norms regarding communication and testing. For example, some cultures may promote direct communication, while others may value indirect communication or expressions of deference. Evaluators should know these differences and adjust their communication styles and testing methods accordingly. Additionally, teachers and evaluators must consider that the strategies of assessments do not always reflect an awareness of students' cultural way of interacting, as they are designed for the majority of the population (Basterra et al., 2011), and consider these ways of interacting when looking at the validity of the assessment they are using.

Socioeconomic status can affect a student's access to educational resources and experiences. Evaluators must be aware of the student's background and consider any factors that may have influenced their academic progress or potential. Being sensitive to how socioeconomic status might affect participation and learning just as quickly as it can impact assessment situations is imperative for evaluators (Nortvedt et al., 2020). The key to achieving increased cultural competence in fair or culturally responsive assessment situations must be achieved (Gay, 2018).

Bias and stereotypes refer to preconceived ideas or prejudices individuals hold towards a particular group. When assessing an emergent bilingual for specific learning disabilities, evaluators need to be aware of their own biases and stereotypes along with any cultural biases that may be present in the assessment tools they prefer to utilize. Evaluators must approach the assessment process with an open mind and avoid making assumptions about the student's abilities or limitations based on their cultural or linguistic background. Evaluators must also be aware of any cultural biases in the assessment tools. When evaluating an emergent bilingual for specific learning disabilities, evaluators should be aware of cultural considerations such as the student's language proficiency, cultural norms, socioeconomic status, and potential biases and stereotypes. Evaluators working with emergent bilinguals must approach the assessment process with an open mind free of bias.

Conclusion

Test publishers provide instructions on technical and interpretive manuals on best practices regarding EBs. One example is the Woodcock-Johnson IV Tests of Achievement Examiner's manual which states:

The most crucial accommodation for English language learners (ELLs) is an examiner knowledgeable about essential issues relevant to second language acquisition, the assessment process, and interpreting test results for ELLs (Shrank et al., 2014p.41).

This article provides foundational information about second language learning and ensures nondiscriminatory evaluations for students suspected of disabilities, especially SLD. Second

language acquisition and its impact on learning (or not learning) are very complex, and educational diagnosticians and school psychologists must engage in intensive self-study beyond what they received in their training programs. We recommend engaging in further study and skill development activities such as a) understanding appropriate test accommodations and modifications for EBs, b) collaboration with speech-language pathologists, bilingual educators, and interpreters, c) using informal tools to support nor-referenced testing and d) policy and instructional practices regarding bilingual programs where students are served prior to special education referral.

References

Byrd, C. T., Bedore, L. M., & Ramos, D. (2015). The Disfluent speech of bilingual Spanish–English children: Considerations for differential diagnosis of stuttering. *Language, Speech, and Hearing Services in Schools*, *46*(1), 30-43. https://doi.org/10.1044/2014_lshss-14-0010

Durgunoglu, A. Y., & Hughes, T. (2010). How Prepared are the U. S. Preservice Teachers to Teach English Language Learners. *The International Journal of Teaching and Learning in Higher Education*, *22*(1), 32–41. http://files.eric.ed.gov/fulltext/EJ913527.pdf

Fact sheets | NCELA - English language acquisition & language instruction educational programs. (n.d.). https://ncela.ed.gov/fact-sheets

Francis, D. J., Rojas, R., Gusewski, S., Santi, K. L., Khalaf, S., Hiebert, L., & Bunta, F. (2019). Speaking and reading in two languages: On the identification of reading and language disabilities in Spanish-speaking English learners. *New Directions for Child and Adolescent Development*, *2019*(166), 15-41. https://doi.org/10.1002/cad.20306

Fuchs, L. S., Fuchs, D., Seethaler, P. M., Cutting, L. E., & Mancilla-Martinez, J. (2019). Connections between reading comprehension and word-problem solving via oral language comprehension: Implications for comorbid learning disabilities. *New Directions for Child and Adolescent Development*, *2019*(165), 73-90. https://doi.org/10.1002/cad.20288

Garcia, O., Kleifgen, J. A., & Falchi, L. (2008). *From English language learners to emergent bilinguals. Equity matters. Research review*.

Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice*. Teachers College Press.

Golloher, A. N., Whitenack, D. A., Simpson, L., & Sacco, D. (2018). From the Ground Up: Providing Support to Emergent Bilinguals to Distinguish Language Difference from Disability. *Insights Into Learning Disabilities*, *15*(2), 127–147. https://files.eric.ed.gov/fulltext/EJ1203413.pdf

Haynes, J. (2007). *Getting started with English language learners: How educators can meet the challenge.* Alexandria, VA: ASCD

Jeanne Batalova Monica Whatley, Jeanne Batalova. (2020, July 20). *Limited English proficient population of the United States in 2011*. migrationpolicy.org. https://www.migrationpolicy.org/article/limited-english-proficient-population-united-states-2011

Kirova, A., & Hennig, K. (2013). Culturally responsive assessment practices: Examples from an intercultural multilingual early learning program for newcomer children. *Power and Education*, *5*(2), 106-119. https://doi.org/10.2304/power.2013.5.2.106

Kohnert, K. (2010). Bilingual children with primary language impairment: Issues, evidence and implications for clinical actions. *Journal of Communication Disorders*, *43*(6), 456-473. https://doi.org/10.1016/j.jcomdis.2010.02.002

Krashen, S. D., & Terrell, T. (1983). *Natural approach* (pp. 20-20). New York: Pergamon.

Lago, S., Mosca, M., & Stutter Garcia, A. (2020). The role of Crosslinguistic influence in multilingual processing: Lexicon versus syntax. *Language Learning*, *71*(S1), 163-192. https://doi.org/10.1111/lang.12412

Language acquisition: An overview. (2020, February 18). Colorín Colorado. https://www.colorincolorado.org/article/language-acquisition-overview

Language in brief. (n.d.). American Speech-Language-Hearing Association | ASHA. https://www.asha.org/practice-portal/clinical-topics/spoken-language-disorders/language-in-brief/

Lopez, F., & Santibanez, L. (2018). Teacher preparation for emergent bilingual students: Implications of evidence for policy. *Education Policy Analysis Archives*, *26*, 36. https://doi.org/10.14507/epaa.26.2866

Metsala, J. L., Sparks, E., David, M., Conrad, N., & Deacon, S. H. (2021). What is the best way to characterise the contributions of oral language to reading comprehension: listening comprehension or individual oral language skills? *Journal of Research in Reading*, *44*(3), 675–694. https://doi-org.msutexas.idm.oclc.org/10.1111/1467-9817.12362

Miller, J. F., Heilmann, J., Nockerts, A., Iglesias, A., Fabiano, L., & Francis, D. J. (2006). Oral Language and Reading in Bilingual Children. *Learning Disabilities Research & Practice (Wiley-Blackwell)*, *21*(1), 30–43. https://doi-org.msutexas.idm.oclc.org/10.1111/j.1540-5826.2006.00205.x

Mostovoy-Luna, E. (2019). Ventura county special education local plan area (SELPA): *Guidelines for evaluation of English language learners for special education eligibility*. Retrieved from: https://www.vcselpa.org/LinkClick.aspx?fileticket=04uInVjCGeA%3D&portalid=0

Nortvedt, G. A., Wiese, E., Brown, M., Burns, D., McNamara, G., O'Hara, J., Altrichter, H., Fellner, M., Herzog-Punzenberger, B., Nayir, F., & Taneri, P. O. (2020). Aiding culturally responsive assessment in schools in a globalising world. *Educational Assessment, Evaluation and Accountability*, *32*(1), 5-27. https://doi.org/10.1007/s11092-020-09316-w

Ortiz, S. O., & Oganes, M. (2022). Nondiscriminatory, cross-cultural school Neuropsychological assessment. *Best Practices in School Neuropsychology*, 41-64. https://doi.org/10.1002/9781119790563.ch4

Rodríguez-Ortiz, I. R., Moreno-Pérez, F. J., Simpson, I. C., Valdés-Coronel, M., & Saldaña, D. (2021). The influence of syntactic knowledge on reading comprehension varies as a function of oral vocabulary in Spanish-speaking children. *Journal of Research in Reading*, *44*(3), 695-714. https://doi.org/10.1111/1467-9817.12363

Samson, J. F., & Collins, B. T. (2012). Preparing All Teachers to Meet the Needs of English Language Learners: Applying Research to Policy and Practice for Teacher Effectiveness. *Center for American Progress*. http://cdn.americanprogress.org/wp-content/uploads/issues/2012/04/pdf/ell_report.pdf

Schrank, F. A., Mather, N., & McGrew, K. S. (2014). Woodcock-Johnson IV Tests of Achievement. Rolling Meadows, IL: Riverside Publishing.

Snowling, M. J., & Hulme, C. (2020). Annual research review: Reading disorders revisited – the critical importance of oral language. *Journal of Child Psychology and Psychiatry*, *62*(5), 635-653. https://doi.org/10.1111/jcpp.13324

Stephens, T. L., Olvera, P., & Schultz, E. K. (2022). Conducting a targeted SLD assessment using the core-selective evaluation process (C-SEP): Implications for assessing English learners. *Contemporary School Psychology*. https://doi.org/10.1007/s40688-022-00443-3

Texas Education Agency. https://tea.texas.gov/sites/default/files/gen-27-english-learner-support.pdf

Wagner, R. K., Francis, D. J., & Morris, R. D. (2005). Identifying English language learners with learning disabilities: Key challenges and possible approaches. *Learning Disabilities Research and Practice*, *20*(1), 6-15. https://doi.org/10.1111/j.1540-5826.2005.00115.x

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Evaluation of Project Stage of a Gifted Program in Terms of Perceptions regarding Collaborative Problem-Solving Experiences: A Novice-Experienced Study

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Abstract

This study aimed to examine the current perceptions of gifted students (n=178) on using collaborative problem solving during projects and to compare their experiences with those of experienced individuals (n=105) on projects. The research method of the study is the quantitative comparative method. Three data collection tools were used: the CPSS scale for gifted students and experienced individuals, Marlowe-Crowne Social Desirability Scale, and Collective Orientation Scale (COS). For analyzing the data, principal components analysis, calculating descriptive statistics, regression, and t-tests for independent groups were used. Regression analysis showed that there was a significant relationship between CPSS and COS scores of the students and the experienced individuals in collaborative problem-solving in a project. The findings indicated that gifted students do not have similar perceptions to experienced individuals. Experienced individuals have more positive perceptions regarding CPSS and COS. Findings showed the necessity of evaluating the project activities provided in a gifted education program in terms of CPSS in detail.

Keywords: collaborative problem solving, collective orientation, gifted students, quantitative comparison, experienced individual on project, BİLSEM, project work

Note: This paper is written from an unpublished master thesis

Evaluation of Project Stage of a Gifted Program in Terms of Perceptions regarding Collaborative Problem-Solving Experiences: A Novice-Experienced Study

Unlike other individual student skills, the Collaborative Problem Solving (CPS) skill is required to produce solutions for problems by using complex performance tasks, with interaction among students (Rosen and Foltz, 2014). Within the scope of PISA 2015, the CPS skill is defined as the ability of an individual or more people to efficiently engage in a solution process by assembling their knowledge, skills, and efforts required and sharing their understanding and work to solve a challenge (OECD, 2017). The CPS skill demands many high-order skills such as supporting the thinking of others, coordinating the ideas of self and others, and interactive working to achieve a target (Luckin, Baines, Çukurova, Holmes, and Mann, 2017). The interrelated complex skills of CPS are classified into three groups within the conceptual framework of 21st-century skills (Trilling and Fadel, 2009). Learning and renewal skills (critical thinking and problem solving, conversation and cooperation, creativity and innovation) fall into the first group; life and career skills (flexibility and adaptability, initiative, social and cross-cultural interaction, productivity and accountability, leadership, and responsibility) fall into the second group; and information, media and technology skills fall into the third group. These are important skills functional in

real-life situations and solution practices which require productivity as they incorporate both high-order thinking (Care, Scoular, and Griffin, 2016) and effective cooperation elements. CPS is not a monotonous process, but a complex and coordinated activity between two or more individuals, and it contains numerous sub-skills. To be able to exhibit a successful CPS skill, individuals must have advanced social skills so that they can work in harmony with the other group members (Hesse, Care, Buder, Sassenberg, and Griffin, 2015). During the CPS process, due to the nature of the challenge, individuals make use of all their knowledge and skills of this kind, and sometimes even their physical resources (Scoular, Care, and Hesse, 2017). CPS is more than individual problem-solving because plenty of skills must be harnessed (Luckin et al., 2017). Luckin et al. (2017) suggested the following model (see Figure 1) demonstrate the CPS terms, concepts, and their relationship.

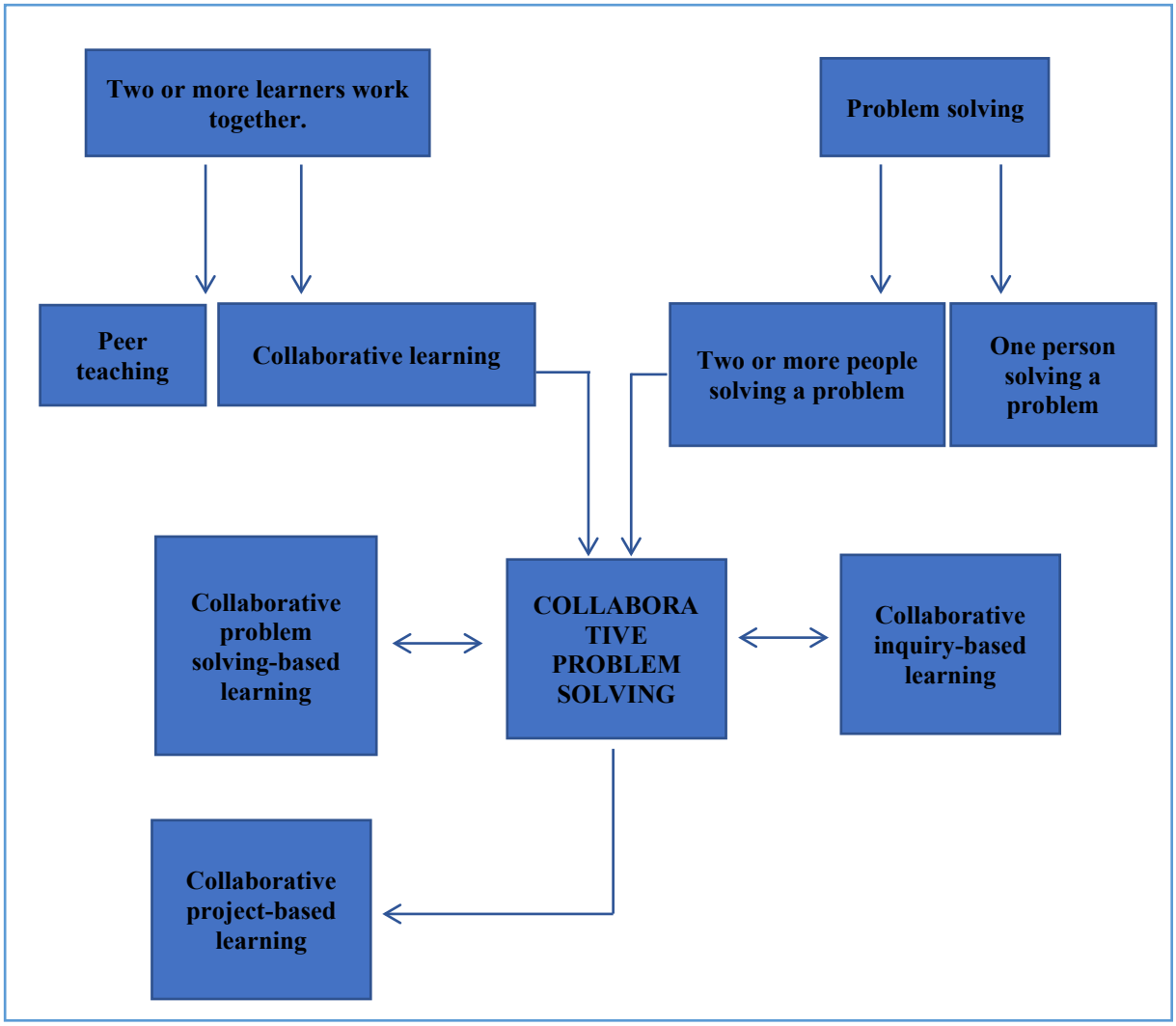

Figure 1. Collaborative problem-solving modeling *(*Luckin et al., 2017).

As a CPS component, collaboration contributes to learning and productivity in significant ways. Gillies (2016) examined the impact of collaboration process on success in his research on

collaborative learning. He concluded that working together in order to reach a common goal leads to a higher-level success and more productivity than working individually. In his study on achievement effects of cooperative learning, Slavin (2014) explained that cooperative working contributes to the motivation (regarding task completion, taking responsibility and participation in learning enhancing processes), social cohesion development in the group (efforts to reinforce learning of group mates, self-assessment) and cognitive elaboration (discussion, decision-making, exposure to perspectives of others, criticism) of students.

There is a similarity with regard to the effects of collaborative working on problem solving. Researches indicate that collaborative problem solving produces better outcomes than competition (Luckin et al., 2017). For example, while Qin Johnson and Johnson (1995) suggest that groups working in cooperation exhibits a better problem-solving process than groups working individually in the meta-analysis including 46 studies, Roseth, Johnson and Johnson (2008) reported that collaborative process is more effective to promote both academic achievement (problem solving) and positive peer relationships in the meta-analysis in which they examined 148 studies. Kwon, Song, Sâri and Khikmatillaeva (2017) expressed that teacher candidates with the experience of collaborative problem-solving process are able to produce higher-quality solutions, in the study they conducted with 12 teachers. Outcomes of studies conducted with other participant groups also yield that learners produce high-order solutions, high achievement, social cohesion and better task motivation at the end of a CPS process (Gillies, 2016; Kwon et al., 2017; Slavin, 2014).

It has been observed that the contribution of collaborations within projects to problem solving process and the experiences of learners during this process are not focused on in the researches summoned above. If examined closely, the insufficient number of studies on gifted students, a student group with a high potential regarding both high-order thinking skills and collaborative working, stands out. Yet, the gifted children, who are innovative and take pleasure in change making, need to create solutions to real-life problems since the concerns of an ordinary child can be quite limited and self-interested, whereas a gifted child is concerned about matters such as world hunger, unfair income distribution and high rates of divorce (Rim, Siegle & Davis, 2018). Considering that these concerns will escalate in adulthood, the skills of planning, strategy development, communication and idea producing which are attained in the project stages in BİLSEMs (Science and Arts Training Center) can be expected to turn into commonly needed and used skills in their adulthood as well (Sak, 2013). These skills have importance in the process of educating gifted individuals because a training process designed to embody these skills is advantageous in offering challenges and enrichment. However, upon examining previous researches in detail, it is seen that any evaluation regarding the quality of CPS process integrated with project practice fostering a challenging and enriched experience critical in learning processes of this group hasn’t been carried out.

Though not specifically on the CSP skill, a number of researches on projects which gifted students participated in and conducted during the course of education and training in BİLSEMs exist in literature. In these researches; the project stage, physical conditions of BİLSEMs and the perspectives of students and teachers have been studied. In the study conducted by Öztürk-Akar and Ayvaz (2018) in order to identify the reasons of gifted students for project participation, data was collected from 39 gifted students. The students specified their reasons for project participation as the intriguing topic and content of a project, the potential of the project to contribute to their science knowledge and the opportunity to receive training from experts.

Furthermore, personality traits such as curiosity, eagerness to learn and enthusiasm to observe were stated as participation reasons. Additionally, previous participation in a similar project and the desire to work together with their friends are among the reasons for project participation. The students gave positive feedback on activities, the content, trainers, social activities and the setting after the project completion. The most remarkable point of this study is the fact that the students took part in a project related to real life and enriched their experiences with activities which are as enjoyable as they are challenging (Öztürk-Akar and Ayvaz, 2018).

There are also a number of previous studies, focused on collaboration behaviors, regarding project experiences of gifted students exclusively. For example, in her research she observed gifted students within the classroom, Leroux (1997) pointed out the low-level collaboration of students and emphasized their need to receive education in environments where they can share learning and collaborate in groups (Leroux, 1997). In another research, Galloway and Porath (1997) inquired the opinions of families and teachers of gifted students. Families described their children as ambitious defenders of their own opinions, and therefore, displaying low-level collaboration in education processes. Unlike the positive aspects of a project stage and the importance of collaboration in project works, the collaborative working capability of gifted students and its contribution to problem solving have not been addressed thoroughly. Moreover, no comparison to a group which can be considered as the norm has been made.

The purpose of the project stage in the education of gifted individuals is explained in BİLSEM guidelines as "*it is sought that the students decide on and explore a subject compatible with their pursuit, desire and abilities, and they obtain new information and produce original ideas*" (The Guidelines of Science and Art Centers, 2019, p.393). However, studies indicate that students need suitable training strategies, they have difficulties in producing original ideas during project work, they are not provided with the appropriate project consultancy, and they experience lack of certain skills. The lack of project experience, professional project stage observation, knowledge of required collaboration forms of students and inefficient project consultation skills of teachers account for this problem (Özarslan, 2015; Özaraslan & Çetin, 2018).

In terms of CPS -considering all the project conducted in BİLSEMs, collaborative work of individuals can enhance their productivity and learning achievement levels (Roseth, Johnson and Johnson, 2008; Slavin, 2014). In addition to collaboration, the fact that the problem-solving process provides gifted children with a challenging cognitive learning experience renders CPS critical for this group. The CPS perception developed during and after a project experience embodying the advantages of both collaboration and problem-solving constitutes a perquisite for higher-level learning. Nevertheless, the lack of standards for the CPS perception of gifted students required by the project stage necessitates a comparison between the perception which gifted students participating in project works must have and the CPS perception of adults with project experience. Consequently, the purpose of this study is to compare the perception of gifted students participating in project works regarding employment of the CPS skill in project experiences to the perception of adults with project experiences, and to determine the employment level of the CPS skill involved in the projects conducted in the BİLSEM.

Related Literature

Even though CPS is a critical goal for gifted individuals, the number of studies investigating it in a project stage and evaluating it in comparison to a norm is insufficient. The present state of the studies on CPS -though not focused on gifted individuals- is summoned below.

Care et al. (2016) argue that the outcomes of collaborative working process enhances learning. Thanks to CPS, students can arrange and reorganize their thoughts and remedy the knowledge deficiencies of group mates, and everybody thus learns from each other (Gu, Chen, Zhu and Lin, 2015). On the other hand, Hesse et al. stresses the effectiveness of CPS in solving complex problems. Students exhibit their levels of understanding more explicitly during social interaction. Moreover, it is argued that, in case of group works, the fact that students perform various cognitive operations, and collaborative activities such as asking questions, peer consultation and providing feedback contributes to solving problems otherwise impossible to be solved (Care et al., 2016). Furthermore, collaborative work of group mates for problem-solving promotes the improvement of cognitive and meta-cognitive skills (Gu et al., 2015).

Experimental studies indicate that CPS-focused processes yield significant attainments. Johnston, James, Lye and Mcdonald (2000) conducted a study in the field of microeconomics with 612 university students of 2nd year, of which 311 are in the test group and 301 are in the control group. In this study, 34-week courses were divided into two groups, and while operation of group processes, efficient use of learning strategies and the skills for the CPS process were taught in the test group, traditional education was conducted in the control group. The study yielded that educators who applied CPS had positive experiences and taught more entertaining classes, and their stress levels were reduced while satisfaction increased. Also, in classes of CPS implementation, the classroom dynamic improved, the students asked more philosophical questions and were more attentive during the class, and learning challenges were overcome, and the classes were observed to be more compelling.

Another experimental study investigating the CPS skill of students was conducted by Gu, Chen, Zhu ve Lin (2015). In this research, a two-month study aiming to improve the skills required to perform collective problem-solving tasks was conducted. A class of 59 3rd grade students were assigned as the control group, and another one as the test group. Both of the student groups were pretested to measure aptitudes, and no significant difference was observed. Lesson plans prepared as questioning and in phases based on CPS for physical sciences class were applied to both groups. The teacher in the test group intervened with and led the group in each phase to teach the CPS skill. In this research, the mixed research design and, for data evaluation, the comparison measurement method were employed. In conclusion of the study, it was determined that both group performance and participation of the test group students were significantly higher compared to the skills of the control group. Furthermore, it was seen that the problem-solving skills of the test group students were at a higher performance level. In addition, the test group students were observed to exhibit processes such as creating their own work plans, time management and volunteering. In the other group, on the contrary, poor planning, difficulty in implementation, obscure role distribution and the presence of students left without a task were recognized. As the study continued, some students in the group progressed to the second phase and worked on the solution of another problem in collaboration. In this phase, it was noticed that the students applied the CPS skill they gained in the first activity to the new problem they

encountered. The most remarkable outcome of this study is that individuals can employ the CPS skill they developed for another setting and case.

Except for the aforementioned studies focused on the contributions of CPS-based implementations, the researches on evaluation of the CPS skill not focused on gifted people are found to be common in literature (Rosen and Foltz, 2014; Lin, Yu, Hsiao, Chu, Chang and Chien, 2015). Rosen and Foltz (2014) evaluated the CPS skill in terms of the effectiveness of computer and peer aid by comparing them in the study they conducted with 179 14-years-old students receiving education in 3 different countries. The purpose of this study is to determine the differences between the collaborative support of a real person and a computer in the problem-solving process. The outcomes of the research revealed that the students aided by and collaborating with the computer in the problem-solving process exhibited higher understanding, better improvement and behaviors more compliant to feedback than the ones who solved problems in collaboration with their peers. The results of this research conclude that the CPS skill promotes higher achievement. However, this study underlines that a computer-aided collaboration process is more effective. Lin, Yu, Hsiao, Chu, Chang and Chien (2015) developed an evaluation system to measure the CPS skill related to science, technology, engineering and mathematics (STEM) education of secondary school students. This study was conducted with 222 Taiwanese secondary school students. In conclusion of this research, the students were found out to have low levels of CPS skill and to be unable to effectively collaborate on a web-based system when they encountered an activity for which they had previous knowledge and practice.

In another study, the CPSS competence of students were determined with a descriptive approach. Li and Liu (2017) evaluated CPSS competencies of 52,110 students of 9th and 10th grade in Taiwan within physical science class scenarios and established that the subjects were competent at 11 and more of 12 skills by analyzing the behavioral patterns of the students. It was revealed that while the students were quite successful in the components of "*identifying the team organization and roles*" and "*the skill of communicating with team members before performing the activities in the transformational process*", they had difficulty in the component of "problem identification on a common ground". It was determined that the students were incompetent to prepare their plans after they communicated with team members, and some students were unable to effectively communicate regarding the actions (Li and Liu, 2017).

As can be understood, previous studies evaluating the CPS skill reveal that the students showing ordinary improvement have a limited employment of these skills. However, this situation will lead to a different picture for gifted children because the motivation related to the cognitive prerequisite skills required by the CPS skill and the challenging aspects within the nature of CPS is present in gifted students.

A study focused on the problem-solving skill of gifted individuals in project stage and indirectly related to CPS was conducted by Barron (2000). Barron (2000) examined the outcomes of collaborative work of gifted individuals for solving mathematical problems, and investigated the effect of collaboration for solving video-based mathematical problems with a complex design on learning and problem-solving performances of students, and 96 gifted students of 6th grade performed the problem-solving process in collaboration or individually. The students were asked to solve a journey plan to a residential area individually or in collaborative groups of three. In this setting, it was aimed that the students would determine the problems faced by the character

in the video “Journey to Cedar Creek” and solve them individually or in collaboration, and they were asked to demonstrate the planning and problem-solving processes in a workbook. The study concluded the finding that the students who worked in collaboration obtained more accurate results in planning and numerical operations than the ones who worked individually. In addition, gifted students were observed to attain better achievement when they worked in collaboration with their peers with similar achievement levels.

The analysis of all the aforementioned researches reveals that the investigations are focused on whether collaboration with computer or an individual is more effective in CPS process, the evaluation of the difference of teaching in a collaborative setting from the traditional method in problem solving process, and comparative analysis of the CPS skill in control and test groups. It stands out that these studies rely on ordinary individuals as subjects, and they lack the focus on the evaluation of gifted individuals based on a professional norm. The limited number of studies conducted with gifted individuals and the deficiency of a norm-based evaluation brought about the idea of a norm-based investigation of the perceived CPSS use of gifted individuals within a project experience in this study.

Method

This research employs the quantitative comparative method (Fraenkel, Wallen and Hyun, 2012), and the dependent variable of the research is the perception regarding the use of the CPS skill for project experience while the independent variable is prior experience in any project process.

Context of Research

The students of the Science and Art Center (BİLSEM) constitute the subjects of this research. BİLSEMs are a group of supplementary education institutions providing diagnosed gifted students with after-school services. Students are admitted to this institution through a two-stage evaluation process. In addition, the teachers are appointed to their position in the school through a distinctive evaluation process. The students receive education in small groups in BİLSEM on certain weekdays after they leave their official schools. The students who are entitled to enrollment in BİLSEM completes the program through the stages of orientation, supporting education, realization of individual gifts, improvement of gifts, project generation and management (The Science and Arts Centers Guidelines, 2019, p.456). Attendance is compulsory in BİLSEM, and students are granted with a certificate in the completion of the programme. For this research, it is critical to discuss the project stage in BİLSEM further. The Science and Arts Centers Guidelines defines the project stage as follows: "Students at the project stage perform a work in a group or individually, in the company of an advisory teacher, in order to attain information on a field or subject of their interest and gifts, produce ideas 18 or make deductions." (The Science and Arts Centers Guidelines, 2019, p.450). The students prepare at least one project of their own choice in a school year. The teacher is not a person who provides information, but monitors the works and process. At least two progress reports are issued in the project stage (The Science and Arts Centers Guidelines, 2019, p. 458).

Research Population and Sample

The participant students of the project stage in BİLSEMs and adults with previous project experience constitute the research group (n= 178 student, n= 105 experienced individual). Available people from this population were selected by means of the biased "availability sampling method". The students selected as sample must be participants in the project stage of BİLSEM. On the other hand, the experienced people must have previous experience in conducting or working as an investigator in national or international projects in any filed. It is a critical point that these people either had experience or were investigators in the projects of TÜBİTAK (the Scientific and Technological Research Council of Turkey), the European Union, TÜBA (Turkish Academy of Sciences) and individual research or the projects sponsored by Ministries and private companies. A general view regarding the perceptions of gifted students for using the CPS skill was obtained by comparing the perceptions of both group for using the CPS skill in the project experience.

Descriptive findings regarding the participant students. 2.8% of the demographic data obtained from the students is missing data. The majority of the students is found out to be male (45.5% female, 54.5% male). Out of the student subjects mostly within the ages of 15-16, only 1 (0.6%) is 12 years old, and 2 (1.1%) are 13, 13 (7.3%) are 14, 57 (32%) are 15, 67 (37.6%) are 16, 25 (14%) are 17, and 8 (4.5%) are 18 years old. The vast majority of the students (38%) are receiving education at the 11^{th} grade, 0.6% at the 7^{th} grade, 2.2% at the 8^{th} grade, 14% at the 9^{th} grade, 32% at the 10^{th} grade, and 10.1% at the 12^{th} grade. Furthermore, 51.1% of the participants have 1 sibling, and 21.3% have 2, 9% have 3, 2.8% have 4 siblings, and 14% do not have any siblings. Additionally, while 92.7% of the participants have their own bedrooms separate from their siblings, 5.1% don't have separate bedrooms. The rest of the demographic data obtained from the subjects is demonstrated in the table below. Furthermore, the parents of most of the students have a bachelor's degree. Another crucial piece of information, although not indicated in the table, is that while 58.4% of the mothers of the students are employed and 40.4% are unemployed, 89.3% of the fathers are employed and 8.4% are unemployed.

Descriptive findings regarding the adults with project experience. 1.7% of the demographic data acquired from 105 adults with previous project experience is missing data. It is found out that most of the participants with previous project experience are males (26.7% female, 68.6% male). Other demographic information acquired from adults with project experience are as follows: The average age of adult participants -mostly between the ages of 30 and 43- is 36. Among the adults with previous project experience, for which academics constitute the vast majority of the participants, there are adults from numerous occupations. It is striking that particularly engineers constitute the participant population.

The majority of the participants with a postgraduate education background of 18 different universities have got their master's degree from Middle East Technical University (10.5%) and Ankara University (6.7%). Furthermore, 6.4% of the participants had their master's degree abroad. It is noticed that the majority of the participants received their doctorate degree from Inönü University (7.6%). This is respectively followed by Hacettepe University (5.7%), Ankara University (4.8%) and Middle East Technical University (3.8%). Moreover, it is observed that 25% of the participants completed their doctorate degree abroad. The data received from the academics, constituting a 23.8% of the participants, reveals that the h-indexes of the adults with project experience is between 0 and 27, the number of their published national articles is between 1 and 110, the number of their published international articles is between 1 and 25, and they have

been referenced between 6 and 3242 times in total. The length of experience in their own expertises of the adults with project experience is 1 to 12 years. The number of adults with over 25 years of experience is 5. Approximately half of the participants work in the fields of computers, technology, softwares and engineering.

Examining the number of the projects each adult with previous project experience participated in, it is seen that the participants are experienced mostly (26.4%) in research projects sponsored by universities. It seems that the number of people experienced in TÜBİTAK projects are 36 (25%), in projects sponsored by a ministry is 23 (16%), in projects sponsored by private companies are 23 (16%), and in the European Union projects are 70 (11.8%). It is a noticeable fact, according to the data obtained, that the least participation related to project experience is to the projects of TÜBA by 7 (4.9%) people. According to the data obtained, one person participated in more than one project.

Data Collection Process

In the research, a scale adaptation and a preliminary pilot scheme were carried out in the beginning. For the pilot scheme, 38 students and 60 adults with project experience provided data. The people participating in the pilot scheme were particularly selected so as to have similar features with the people intended to be included in the original study. During the selection of pilot scheme participants, having project experience in BİLSEMs for the students and having the experience of project process for adults was set as a precondition. After the pilot scheme, the exploratory factor analysis and social desirability analysis were made.

In the original study, scales were delivered by hand or via on-line platforms to the 178 students in the project school year in BİLSEMs of various provinces in Turkey and 105 adult participants with project experience. During the implementation of the scales, the students and adults were provided with the explanation of the study purpose, introduced to the data collection tools, and explained that the study participation is based on voluntariness and they can drop out if and when they want. After the relevant people were provided with the required information on the study by the investigators, the individual information form, the Scale of Collective Orientation, the Perception Scale of Using Collaborative Problem-Solving Skills and the Marlow-Crown Social Desirability Scale were conducted and collected in this order. During the data collection process, the implementations were completed without any interference with the answers of the participants. It was clarified that the collected data will not be used against their will and authorization, and will be kept in a protected data store. It was also explained that the information in the questionnaire form will not be shared with a third party, and the personal data will be protected.

Data Collection Tools

Perception Scale of Using the Collaborative Problem-Solving Skill

In order to determine the perceptions of the students and adults with project experience for using the CPS skill in the overall project experience, a 15-item scale was used with the guidance of the study of Davier, Hao, Liu ve Kyllonen (2017) and the framework prepared by OECD. The statement “I maintain strong communication regarding a problem with my teammates during the group works.” can be given as an example item. The principal component analysis (The Principal Component Analysis technique, Varimax rotation was employed.) for validity and reliability of the 5-point (0= never, 1= rarely, 2= sometimes, 3= very often, 4= always) “Perception Scale of

the Collaborative Problem-Solving Skill" -carried out individually with 38 students and 60 adults with project experience- was conducted.

The outcomes of the principal component analysis for data of the students yielded the Kaiser Meyer Olkin (KMO) value as 0.68. The KMO test helps to determine whether the sample is sufficient for factor analysis, and this value is expected to be over 0.60. The results of Bartlett's Test of Sphericity (136.230, *df:28, p*<0.05) are expected to turn out significant. Therefore, the KMO value and Bartlett's test result in this study can be interpreted as acceptable (Sharma, 1996; Tavşancıl, 2002). The analysis based on the results of the principal component data analysis confirmed the 2-factor structure with the items with a factor loading over 0.40. Certain items were excluded from the analysis since they formed either more than one or just a single factor. The excluded items are 4, 13, 15, 7, 14, 8 and 1 respectively. The analysis conducted after item exclusion confirmed the 2-factor structure. The variance ratio revealed by these factors is 67%. The factor names and related items are listed in Table 1. The reliability values for each factor are demonstrated in the same table.

Table 1

The Factor Structures of the Perception Scale of Using the Collaborative Problem-Solving Skill for Students

Factor names	Applicable Items	Reliability Values
Factor 1: Contribution to Problem-Solving within Group	1, 2, 3, 4	.83
2. Factor: Communication during Collaboration	5, 6, 7, 8	.83

Considering that the reliability value of the Perception Scale of Using the Collaborative Problem-Solving Skill for Students within a project experience is strongly acceptable over .8, the internal consistency values of the Perception Scale of Using the Collaborative Problem-Solving Skill can be considered strongly acceptable (Kılıç, 2016).

On the other hand, the principal component analysis for adults with previous project experience (The Principal Component Analysis technique, Varimax rotation was employed.) was carried out based on 8 items by taking the factor structure obtained from the students into account in order to attain parallel forms. The outcomes of the factor analysis yielded the Kaiser Meyer Olkin (KMO) value as 0.65. The results of Bartlett's Test of Sphericity (137.154, *df:28, p*<0.05) were significant. Therefore, the KMO value and Bartlett test result in this study can be interpreted as acceptable (Sharma, 1996; Tavşancıl, 2002). As a result of the analysis based on the results of the principal component data analysis, the data of the adults with project experience formed a 3-factor structure with the items with a factor loading over 0.40. The variance ratio revealed by these factors is 77%. The factor names and related items are listed in Table 2. The reliability values for each factor are demonstrated in the same table.

Table 2

The Factor Structures of the Perception Scale of Using the Collaborative Problem-Solving Skill for Adults with Project Experience

Factor names	Applicable Items	Reliability Values
Factor 1: Contribution to Problem-Solving within Group	1, 2, 3, 4	.85
Factor 2: Communication during Collaboration	5, 6	.72
Factor 3: Maintaining Effective Conversation	7, 8	.64

Examining the reliability values of the scale factors of the Perception for using the CPS Skill within a project experience for adults with previous project experience, the reliability values can be considered acceptable (Kılıç, 2016). The size of *Contribution to problem-solving within group* has a reliability over .8 and it can be interpreted as strongly acceptable. Considering that the reliability value is acceptable over .7 and moderately acceptable over .6, it can be concluded that *collaborative communication is acceptable,* and *maintaining effective conversation* is moderately acceptable (Kılıç, 2016).

Collective Orientation Scale

The results of the principal component analysis conducted individually with 38 students and 60 adults with project experience for the 13-item 5-point likert scale, which was prepared with items selected from the "Collective Orientation Scale" designed by Driskell, Salas ve Hughes (2010) and the "Scale of Eagerness and Willingness to Share" designed by Hooff and Hendrix (2004), I strongly agree, 2: I agree, 3: I neither agree nor disagree, 4: I disagree, 5: I strongly disagree) in order to determine the overall collective orientation, in other words, the availability for collaboration of the students and the adults with project experience are presented in the following paragraph. The statement "Teams usually work more effectively." can be given as an example. Since the factor structure of the scale designed by taking items from two other scales cannot be explained with one theory, the principal component analysis was conducted.

The results of the principal component analysis (The Principal Component Analysis technique, Varimax rotation was employed.) conducted on the data obtained from the students yielded the Kaiser Meyer Olkin (KMO) value as 0.78. The results of Bartlett's Test of Sphericity (213.314, *df:55, p*<0.05) were significant. Therefore, it can be concluded that, in this research, the KMO value is acceptable, and the Bartlett's Test results confirm the sphericity of the data (Sharma, 1996; Tavşancıl, 2002).

Based on the results of the principal component analysis of the data, the items 8, 13, 2 and 6 were respectively excluded from the analysis since they had more than one factor loading. The analysis conducted after the exclusion of items confirmed the 3-factor structure with the items with a factor loading over 0.40. The variance ratio revealed by these factors is 73%. The factor

names and related items are listed in Table 3. The reliability values for each factor are demonstrated in the same table.

Table 3
The Factor Structures of Collective Orientation Scale for Students

Factor names	Applicable Items	Reliability Values
Factor 1: Individual Work Orientation	2, 4, 5	.77
Factor 2: Group Work Orientation	1, 3, 9	.82
Factor 3: Decision Making based on Personal Opinions	6, 7, 8	.74

Considering that the reliability value of Collective Orientation scale factors for students is acceptable over .7, the internal consistency values of collective orientation is acceptable (Frankel, Wallen and Hyun, 2012; Kılıç, 2016).

On the other hand, the principal component analysis for adults with previous project experience (The Principal Component Analysis technique, Varimax rotation was employed.) was carried out based on 9 items by taking the factor structure obtained from the students into account. The outcomes of the factor analysis yield the Kaiser Meyer Olkin (KMO) value as 0.62. The results of Bartlett's Test of Sphericity (248.598, *df:78, p*<0.05) were significant. Therefore, the KMO value and Bartlett test results in this study can be interpreted as acceptable (Sharma, 1996; Tavşancıl, 2002).

The analysis based on the results of the principal component data analysis confirmed the 3-factor structure with the items with a factor loading over 0.40. The variance ratio revealed by these factors is 63%. The factor names and related items are listed in Table 4. The reliability values for each factor are demonstrated in the same table.

Table 4

Factor Structures of the Collective Orientation Scale for Adults with Project Experience

Factor names	Applicable Items	Reliability Values
Factor 1: Individual Work Orientation	2, 4, 5	.63
Factor 2: Group Work Orientation	1, 3, 9	.62
Factor 3: Decision Making based on Personal Opinions	6, 7, 8	.80

Considering that the reliability value of the Collective Orientation factors for adults with project experience is .6 and moderately acceptable, it can be suggested that the internal consistency coefficients for individual and group work orientation of adults with project experience, as one of the collective orientation factors, are moderately acceptable, however, the internal consistency

coefficient for the factor of decision making based on personal opinions is strongly acceptable (Frankel et al., 2012; Kılıç, 2016).

Marlowe-Crowne Social Desirability Scale. The "Marlowe-Crowne Social Desirability Scale (MC-SDS)" translated to Turkish by Köse and Sayar (2001) is employed in order to accumulate evidence for validity of the Perception Scale of Using the Collaborative Problem-Solving Skill and to assess the social desirability bias level of the participants. This is a 33-item scale using a true/false response format. The expression "No matter who I'm talking to, I'm always a good listener." is an example of the items. Among all the social desirability measurement tools, the Marlow-Crowne Social Desirability Scale is the one used most commonly (Vésteinsdóttir, Reips, Joinson & Thorsdottir, 2015). A scale with a one-factor structure has the reliability value of .65.

Personal information form. This includes elements such as the name, surname, age, gender, class level, school name, number of siblings, occupational and educational status of parents, number of books in the household, existence of a separate room and frequency of buying newspaper for the household of the student. The reason for selection of these variables is to identify the socio-economic and educational status of the students in BİLSEMs.

The personal information form prepared for the adults with previous project experience consists of the information of name, surname, title, gender, age, occupation, universities and departments for the bachelor's, master's and doctorate degrees, h-index, total number of articles, study field, total number of citations, research experience, type and number of the completed projects. This information is acquired in order to determine the educational and academic background which contributed to the project experience of the adults with previous project experience. The intended purpose of each data collection tool is summed up in Table 5.

Table 5

Data Collection Tools

Research Question	Data Collection Tool
What are the demographic details of participants?	Personal information form
Are the participants collective oriented? Are the collective orientation levels of participants related to their perception of using the CPS skill?	Collective Orientation Scale
What are the perception levels of participants regarding using the CPS skill?	Perception Scale of Using the CPS Skill
Do the participants have the tendency to respond in a manner which will be approved by society?	Marlowe-Crowne Social Desirability Scale

Findings and Interpretation

The findings of this research will be presented in two groups: Descriptive findings and inferential findings.

Descriptive findings regarding the scores obtained from scales

The findings to identify the perception of adults with project experience and students for using the collaborative problem-solving skill in project stage are demonstrated in Table 6.

Table 6

Analysis of the Perception Scale of Using the Collaborative Problem-Solving Skill

Collaborative Problem Solving	Groups					
	Students (n = 178)			Experts (n = 105)		
	X	*Ss*	*SH*	*X*	*Ss*	*SH*
F1- Contribution to Problem-Solving within Group	3.14	.71	.05	3.29	.58	.06
F2 - Communication during Collaboration	3.15	.72	.05	3.56	.48	.05
F3 - Maintaining Effective Conversation	-	-	-	3.30	.59	.06

Note: The group work orientation items are reverse coded.

The analysis results show that the students display a positive perception above average for contribution to problem solving within group and collaborative communication. On the other hand, the adults with project experience are observed to have high-level positive perception for contribution to problem-solving within group, collaborative communication and maintaining effective conversation.

The analysis to determine the collective orientation levels of the participant students and adults with previous project experience are demonstrated in Table 7.

Table 7

Collective Orientation Scale

Collective Orientation	Groups					
	Students (n = 178)			Adults with Project Experience (n = 105)		
	X	*Ss*	*SH*	*X*	*Ss*	*SH*
F1 - Individual Work Orientation	2.59	.87	.07	2.77	.87	.08
F2 - Group Work Orientation	3.49	.86	.06	4.19	.72	.07
F3 - Decision Making based on Personal Opinions	3.08	.93	.07	3.18	.93	.09

When the results of the analysis are examined, it is seen that the students have negative perception for individual work orientation, positive perception for group work orientation, and indecisiveness for decision making based on personal opinions. On the other hand, the adults with previous project experience have indecisiveness for individual work orientation and decision making based on personal opinions while they have positive perception for group work orientation. Therefore, it can be concluded that the CPS findings regarding group work are supported by the COS findings. In this research, this situation is considered as evidence for validity.

Inferential Findings

In this study, the correlation analysis for the relationship between the variables of social desirability and collinearity was conducted primarily. Collinearity is a prerequisite for the regression analysis after this. Examining the relationship of the factors revealed by the Perception Scales for Collective Orientation, Social Desirability and Using the CPS Skill obtained from the adults with previous project experience (Table 8), it is observed that neither the adults with previous project experience nor the students gave answers in line with social desirability.

Table 8

Interfactor Correlation Values for the Data Obtained from the Students

Factors	COS - F1	COS - F2	COS - F3	COS - T	CPS - F1	CPS - F2	CPS - T	SOC - DES
COS - F1	1							
COS - F2	.507*	1						
COS - F3	.320*	.366*	1					
COS - T	.779*	.799*	.742*	1				
CPS - F1	-.071	.167*	.099	.085	1			
CPS - F2	.081	.292*	.236*	.264*	.639*	1		
CPS - T	.006	.254*	.186*	.193*	.904*	.907*	1	
SOC - DES	-.125	-.151*	-.044	-.136	-.055	-.105	-.089	1

Note: The * mark shows a significant relationship at the level of 0.05.

The findings reveal that the Individual Work Orientation for the collective orientation factors does not exhibit a significant relationship with both of the CPS skill factors (contribution to problem solving within group and resistance to communication with other group members). Similarly, there is no significant relationship between the factors of decision making based on personal opinions and contribution to problem-solving within group. As demonstrated in Table 8, there is no significant and strong relationship between the scores obtained from the social desirability scale and other scales. This proves that the answers of the students don't meet social desirability.

Table 9

Correlation Values Between Factors for the Data Obtained from the Adults with Project Experience

Factors	COS - F1	COS - F2	COS - F3	COS - T	CPS - F1	CPS - F2	CPS - F3	CPS - T	SOC - DES
COS - F1	1								
COS - F2	.221*	1							
COS - F3	.381*	.415*	1						
COS - T	.730*	.686*	.823*	1					
CPS - F1	.014	.022	.136	.081	1				
CPS - F2	.199*	.261*	.185	.281*	.376*	1			
CPS - F3	.165	.213*	.121	.216*	.402*	.391*	1		
CPS - T	.119	.157	.181	.203*	.893*	.652*	.705*	1	
SOC - DES	.144	.143	.107	.173	.009	.162	.039	.063	1

*shows a significant relationship at the level of 0.05.

The findings in Table 9 reveal that there is a significant relationship between the factors of Collective Orientation, and the two factors of Collective Orientation (individual work orientation and decision making based on personal opinions) regarding CPS has a positively significant relationship. According to the relationship between the scores obtained from the Social Desirability scale and other scales, it was observed that there is no evidence to prove any effect of the desirability (Işık, 2016).

The Findings of Regression Analysis

Multiple regression analysis between the factors of CPS and Collective Orientation was conducted based on the data obtained from the students. The purpose of this analysis is to test the validity of the measurement of the Perception for using the CPS Skill. Before conducting the regression analysis, the mean and standard deviation of the scores for the relevant variable were calculated. According to the analysis results, the mean and standard deviations of the Collective Orientation factors are demonstrated in Table 10.

Table 10

The Mean and Standard Deviations of the Collective Orientation Points of the Students

Collective Orientation (n = 178)	X	*Ss*
Individual Work Orientation	2.59	.87
Group Work Orientation	3.49	.86
Decision Making based on Personal Opinions	3.08	.93

As revealed by the regression analysis, CPS and Collective Orientation have been seen to have a positively significant relationship ($R = 0.32$, $F(3;174)=6.49$, $p<0.05$). The regression equation (the mathematical model) for CPS prediction according to the regression analysis results is as follows:

Y' = 2.436 - 0.142*F1 + 0.226*F2 + 0.095*F3

CPS' = 2.436 - 0.142*Individual Work Orientation + 0.226*Group Work Orientation + 0.095* The Orientation for Decision Making Based on Personal Opinions

It has been observed that there is a negatively weak relationship between CPS and Individual Work Orientation (F1), and a positively significant relationship between Group Work Orientation (F2) and CPS. No statistically significant relationship has been found between the Orientation of Decision Making based on Personal Opinions (F3) and CPS.

The multiple correlation coefficient ($R^2 = 0.10$) indicates that 10% of Collaborative Problem Solving can be predicted with a linear combination by the Cooperative Orientation factors. This finding supports the validity of the measurements conducted with the students regarding CPS.

Multiple regression analysis between the factors of CPS and Collective Orientation was conducted based on the data obtained from the adults with previous project experience. According to the analysis results, the mean and standard deviations of the Collective Orientation factors are demonstrated in Table 11.

Table 11

The Mean and Standard Deviations of the Collective Orientation Points of the Adults with Project Experience

Collective Orientation (n = 105)	X	Ss	SH
Individual Work Orientation	2.77	.87	.08
Group Work Orientation	4.19	.72	.07
Decision Making based on Personal Opinions	3.18	.93	.09

As revealed by the analysis, CPS and Collective Orientation of the adults with previous project experience don't have a positively significant relationship (R = 0.21, F(3;101)=1.51, p<0.05). The regression equation (the mathematical model) for CPS prediction according to the regression analysis results is as follows:

Y' = 2.858 + 0.026*F1 + 0.058*F2 + 0.058*F3

CPS' = 2.858 + 0.026*Individual Work Orientation + 0.058*Group Work Orientation + 0.085* The Orientation of Decision Making Based on Personal Opinions

The multiple correlation coefficient (R^2 = 0.04) indicates that 4% of CPS can be predicted with a linear combination by the Cooperative Orientation factors. This finding doesn't support the validity of the measurements regarding CPS. Therefore, the perception scores regarding the CPS skill obtained from the adults with previous project experience were considered valid due to the evidence presented in other validity types (structure, social desirability, scope and difference-based validity).

Findings regarding the comparison of the perception of the adults with previous project experience and the students for COS and using the CPS skill.

Independent samples are t-tested in order to compare the CPS and COS levels of adults with previous project experience and gifted students. The results of the t-tests on independent samples reveal that there is a significant difference between the scores of Perception of the adults with previous project experience and the gifted students for using the Collaborative Problem-Solving Skill (t (281)=3.245 p<.01). The levels of Perception for using the Collaborative Problem-Solving Skill of the adults with previous project experience ($\bar{x}$ = 3.36) are significantly higher than the students ($\bar{x}$ = 3.15). The Cohen d-effect valance was calculated for the t-test results of Perception of the adults with previous project experience and the students for using the Collaborative Problem-Solving Skill. The effect valance of the difference between the Perception of the adults with previous project experience and the students for using the Collaborative Problem-Solving Skill was found 0.28. It can be claimed that the effect size is small since this value is within the range of 0.2 and 0.5 (Kılıç, 2016).

According to the results of the t-test conducted for another validity evidence, regarding whether the Cooperative Orientation levels vary across the adults with previous project experience and the gifted students, the Collective Orientation levels of the adults with previous project experience and the gifted students differ significantly (t (281)=3,96 p<.01). The levels of

Perception for Collective Orientation of the adults with previous project experience ($\bar{x}$ = 3.38) are significantly higher than the gifted students ($\bar{x}$ = 3.05). The effect valance of the difference between the Perception of the adults with previous project experience and the gifted students for Collective Orientation was found 0.41. The effect size can be interpreted to be small since this value is within the range of 0.2 and 0.5 (Kılıç, 2016). This finding is also another evidence for validity of the CPS measurements.

Conclusion, Discussion and Implications

The purpose of this study is to determine the current perception of the gifted students, who are receiving education in BİLSEMs and have participated in the project stage, for using the CPS skill, and to reach a general view on the project stages in BİLSEM by comparing these perceptions with the perceptions of the adults with previous project experience. In this study, it was concluded that the gifted students, who are receiving education in BİLSEM and have participated in the project stage prefer group work to individual work. Furthermore, it was discovered that the perceptions of the students for using the CPS skill needed for collaborative work is at the average level and lower than the adults with previous project experience. It is also found that the students have a lower perception for collective orientation than the adults with project experience.

The scores obtained from the perception scale of using the CPS skill reveal that the students have a positive perception above average for the factors *contribution to problem solving within group* (X = 3.14) and *collaborative communication* (X = 3.15). It is quite remarkable that the scores received are above average and very close to each other. The fact that these values are close to each other supports the correlation finding on the relationship between problem-solving and communicative skills, as well. A study supporting this finding was conducted by Li and Liu (2017). In this study evaluating CPS competencies with scenarios of physical sciences class, it was determined that 9th and 10th grade students in Taiwan are competent at all of the sub-skills specified within the frame of the OECD. While one of the two highest skills within the frame of CPS is role definitions of team members, the other is communication with team members. In other words, thinking within the frame of CPS, the communication skill plays a crucial part in contribution to problem-solving within group and developing a common understanding for the problem. In the literature, there are researches demonstrating that the gifted students show increased levels of knowledge, improved skills of collaboration, communication, resolving conflicts, and increased willingness to participate in projects (Akyol, Köseoğlu, Türkay, Kadımab ve Özkan, 2015; Çetinkaya, 2013; Diffily, 2002; Karademir, 2016; Kılınç, Koç-Şenol, Eraslan and Büyük, 2013; Nacaroğlu and Arslan, 2019; Nacaroğlu, Arslan and Bektaş, 2019; Öztürk-Akar and Ayvaz, 2018; Repinc and Južnič, 2013; Su, 2019; Şahin, Kabasakal and Çelebi, 2019; Wang, Huang and Hwang, 2014). The findings of this study support the literature. One of the reasons for this is that positive processes could be fostered by means of the group structure in terms of the collaborative communication and contribution to problem-solving within group in the BİLSEM project stage. Students work contentedly and can take extraordinary risks in groups composed of individuals with homogeneous or similar gifts (Hunt, 1996; Adams-Byers, Whitsell & Moon, 2004), however, the essence of the reactions to this risk-taking behavior determines the essence for further initiative. In groups of homogeneous gifted students, their sharing can increase and effective communication can be ensured more easily due to the nature of students.

This can accordingly shape the positive perception regarding contribution to both problem-solving and communication.

When the results obtained from the collective orientation scale are examined, it is seen that the students have negative perception for individual *work orientation*, positive perception for *group work orientation,* and indecisiveness for *decision making based on personal opinions.* The data obtained indicates that students prefer group work to individual work. When the studies in this field were examined, no study could be found which can directly explain the findings of this study. Therefore, we resorted to the studies conducted on collaborative learning processes of gifted learners implicitly.

According to the scores obtained from the collective orientation, it is seen that the students in the project stage in BİLSEM have a positive perception for group work rather than individual work, but not at a sufficient level. There are studies supporting that both average (Ellison and Wade-Boykin, 1994; Johnson and Johnson, 1988; Johnson, Skon and Johnson, 1980; Koç, 2018; Layman, 2006; McCorkle, Reardon, Alexander, Kling, Harris and Iyer, 1999; Mo, 2017; Roseth, Johnson and Johnson, 2008; Slavin, 2014; Yazıcı, 2004) and gifted learners prefer group work to individual work (Burns, Johnson and Gable, 1998; Dunn and Price, 1980; Nacaroğlu and Arslan, 2019; Özarslan and Çetin, 2018; Rayneri, Gerber and Wiley, 2006). It is known that students are more productive and can attain higher-order skills when they work in collaboration (Roseth, Johnson and Johnson, 2008; Slavin, 2014). Group work equips the individual with the ability of decision-making and problem-solving, improves the skill of problem identification of an individual, enhances self-confidence and helps the collaborative work habit increase (Nacaroğlu and Arslan, 2019; Yazıcı, 2004). Providing the students with the opportunity to use the collaboration skill in both learning and evaluation processes also prepares them for collaboration in the business world (Yazıcı, 2004). The skill to work as a team promotes the social development of learners by improving the ability to resolve conflicts from a different point of view, enhancing the synergy between people, and contributing to human relations, as well (McCorkle et al., 1999). As a matter of fact, gifted learners enjoy exchanging ideas, learning from each other and receiving new information during group work (Chan, 2001). The reason for the positive approach of the gifted to group work in the BİLSEM project stage may stem from the fact that they work in a homogeneous group. Hunt (1996) stated that the gifted learners working within groups completed the stage with more positive learning outcomes. Adams-Byers, Whitsell and Moon (2004) explained that gifted students appreciate coming together and working with other gifted students with characteristics similar to their own.

On the other side, there are studies claiming that students prefer individual work to group work for both average (Michaels, 1977; Wagner III, 1995) and gifted learners (Chan, 2001; Griggs and Price, 1980; Sak, 2004), and the findings of these studies conflict with the findings of this study. As a matter of fact, that the average of group work orientation is lower than the desired level might be related to these findings. The large number of people in groups, inability to complete the task as the number of people increases, interpersonal conflicts, unfair division of labor, longer duration of work completion, inability to designate a mutual meeting time, the existence of people without the sense of work ownership, injured faith of the learners who take responsibility in group work can be listed among the reasons of the fact that the students prefer individual work to group work (Layman, 2006; McCorkle et al., 1999). The characteristics of the convened group may also affect the orientations of students. For example, in a group formed heterogeneously, gifted students choose to work individually during the activities (As cited in

Porter, 2005). The students with higher academic success levels usually don't prefer group work, and even if they do, they expect the group to be formed in accordance with the following conditions: Small groups classified by abilities, coexistence of people from different class levels at the same project, the possibility to drop the work-shies out of the group and the opportunity of individual note-taking for everyone in the same project according to their own work (Grzimek, Marks and Kinnamon, 2014). The ones, who want the project to run smoothly and want to obtain better results and are unable to build positive relationships with other group members and experience difficulty in meeting with the members after school, have the tendency to choose to work individually (Layman, 2006). Moreover, an individual work can be completed in a shorter period of time and, on top of that, at almost the same efficiency level (Ellison and Wade-Boykin, 1994). If there are performance tasks of students such as individual reading or test / assessment in the in-class activities or there is a competitive atmosphere, students prefer working individually (Michaels, 1977). Even if they have a tendency to group work, students may tend to work on their own due to the communication problems they experience, inability to be organized, difficulties in time management and inability to properly manage the collaborative processes. In addition to all these findings, it is also established that students choose to work individually for tasks with lower points and shorter durations and to work within group for tasks with higher points and longer durations (McCorkle et al., 1999). It can be beneficial to have the knowledge of learning styles of the students for the groups to be convened by teachers. Learning styles, motivations and attitudes of group members are noteworthy factors for a better level of achievement of students, in academic project works (Gardner and Korth, 1998; Sak, 2004).

Beside all these, the classroom adaptation problems and inadequacies regarding social skills of gifted students may lead to the tendency to work individually. Because of the simplicity of the learning subjects for their level, they may display the behaviors of indifference to group work, unwillingness for participation in activities, keeping themselves occupied with unrelated things, inability to perform tasks in group works, inability to communicate or the exact opposite - constant talking, criticizing the answers of group members (Saranlı and Metin, 2012; Sezer, 2015).

To sum up, certain problems may lead to the lack of sufficient positive perception of individuals for group work. In terms of contribution to problem solving and collaborative communication in the process of problem solving within group, previous personal experiences of gifted learners regarding their positive perceptions is also an influential factor. The positive experiences of previous projects conducted in BİLSEMs (well-equipped advisory teachers for the project stages of designing, management, conducting and evaluation) can also produce this perception. The findings obtained in this study establish that the conditions for group work are satisfied to a large extent in the project works in BİLSEMs, but, the collaborative process required for conducting a project at a professional level cannot be ensured.

In the literature, there is a dominance of studies reporting the preference for group work of average learners (Ellison and Wade-Boykin, 1994; Johnson and Johnson, 1989; Johnson, Skon and Johnson, 1980; Koç, 2018; Layman, 2006; McCorkle et al., 1999; Mo, 2017; Roseth, Johnson and Johnson, 2008; Slavin, 2014) and gifted learners (Burns, Johnson and Gable, 1998; Dunn and Price, 1980; Nacaroğlu and Arslan, 2019; Özarslan and Çetin, 2018; Rayneri, Gerber and Wiley, 2006). Students usually prefer to work within a group to complete the assigned works in a shorter period of time and for a more organized run of the works (Koç, 2018; Layman, 2006). However, working within a group may take more time than working individually to

exchange ideas and have discussions on the subject. For example, it was observed that the students working in groups completed the writing task assigned to them in a longer period of time than the ones working individually, but, wrote shorter texts. However, when the content and accuracy of the texts were compared, it was discovered that more successful outcomes were produced in favor of group work (Storch, 2005).

Another critical finding of the research is that students exhibit indecisiveness in terms of the orientation for *decision making based on personal opinions*. Gifted students may have the behavioral tendencies to be leaders and act as leaders in their group of friends, standing by their own decisions, forcing others to defend their opinions and accept their creative ideas (Çetinkaya, Maya-Çalışkan and Güngör, 2012; Çitil and Ataman, 2018; Markusic, 2012). As reported by Piechowski (2006), it is known that gifted students also have the behavioral patterns of resistance to group members due to their passion for investigation, questioning and problem solving, doubts about their ideas, conflict and insubordination with their friends and teachers (As cited in Piechowski, 2009). These studies yield that gifted learners take mostly their own opinions as a reference. However, this case is influenced by the characteristics of the group. For example, exhibition of decreases in terms of academic-self among the students in a homogeneous group of gifted students with similar characteristics, in other words, indecisiveness to care for the value of their own decisions and competencies was recorded (Marsh, Chessor, Craven and Roche, 1995). Therefore, it is expected to observe this indecisiveness in the project stage in a school providing education based on homogeneous grouping such as BİLSEM.

According to the data obtained from the collective orientation scale, another finding of the project is that the adults with previous project experience have positive perception for *group work orientation* and exhibit indecisiveness for *individual work orientation*. The average point, 4.19, of group work orientation of the adults with previous project experience indicates that they are eager and willing to work within group at a high level. For a successful team work, individuals must feel as a part of the group and consider themselves valuable, each member must have prestige and importance within the group, goal attainment must promise achievement, appreciation or a reward, learning from others must lead to personal improvement, and individuals must recognize their similarities to other members. We can suggest that the adults with previous project experience, who were participants of this study, carried out positive collaboration works, were appreciated and experienced self-improvement. Team works in business life require the active utilization of certain skills such as problem solving, communication, collaboration, strong management of interpersonal relationships and time management (Tarricone and Luca, 2002). The fact that group work enhances productivity for students who are or will get in the business world is backed by researches (Alghamdi and Bach, 2018; Grzimek, Marks and Kinnamon, 2014; Hara, Solomon, Kim and Sonnenwald, 2003; İbrahim, Costello and Wilkinson, 2011; Scarnati, 2001; Tarricone and Luca, 2002; Yusuf and Anuar, 2014). The positive feedback for the experience of high-quality production and high-order skills can be suggested to play a role in positive perception of adults with previous project experience.

According to the data obtained from the perception scale of using the CPS skill, it has been observed that the adults with project experience exhibit positive perception of a quite high level for the factor of *contribution to problem-solving* within group. The exhibition of positive perception of the adults for contribution to problem-solving can be related to their previous experiences. Aga, Noorderhaven and Vallejo (2016) reported a positive relationship between the

approach of the group leader and the success of the project and accurate team building in the studies they conducted. This case suggests the possibility of positive perception development in a project led by a team-motivating leader. Another reason for the exhibition of positive perception of experienced adults for contribution to problem-solving within group can be their previous experiences with experienced people and of motivating processes in projects. Tatık and Ayçiçek (2020) reported that the academics in project stages have a solution-oriented approach towards the problems encountered, attribute importance in working in discipline for successful completion of the project and have a collaborative approach. They suggested that the academics think that, if they participate in a project again, they will select team members meticulously, and a team of investigators from various disciplines will enrich the project, and the project thus will be original. In other words, the more project people experience, the better and more effective the process becomes.

It is observed that the average value of individual work orientation of the adults with previous project experience is 2.77, and this falls within the average level. Since learners gain various experiences before they get into business life, they already have different learning styles and everybody has different attitudes toward group work. All of these have an impact on the preference of people for working within a group or individually (Gardner and Korth, 1998). In the cases of lack of a leader in the group, inability to resolve disagreements, indifference to team improvement, looking after the interests of self and evasion of work, people are likely to choose working individually (Hansen, 2006). Competitive atmosphere, personalized goals, ineffective communication, interpersonal conflicts, deficiency of resources, lack of trust, lack of collaboration and cultural conflicts are among the factors which prevent team work (Scarnati, 2001). In a research conducted with academics, it was reported that academics are driven towards individuality by individual's conduct of work, score-based seniority system, competition and increase in the use of communication technologies (Ölçer and Koçer, 2015).

Certain problems are encountered during group works, such as unclear goals and inefficient leadership. In order to prevent these problems, individuals must communicate more effectively, share the tasks and work simultaneously in collaboration (Alghamdi and Bach, 2018). The people who are working experience conflicts due to communication problems, and if these conflicts between team members cannot be resolved, people steer away from each other and become unwilling to work together. Conflicts have an impact on the feeling of peace and performance and efficiency in the group (Yusuf and Anuar, 2014). In order to attain achievement in group work, every group member is required to make assessments, collect data, provide resources, distribute tasks and arrange the contributors and their contribution levels and volumes. However, the process of individual work is less complicated and doesn't need interpersonal exchanges and arrangements. Whether a person is able to make an accurate analysis in order to select the resources to be used is the crucial point (Steiner, 1966). As a matter of fact, it is apparent that group works are more efficient than the average individual performance and accepted to a wider extent by companies and institutions in terms of the ability of employees to identify a problem, reject incorrect solutions, define solutions and approve correct solutions (Yusuf and Anuar, 2014). The business world of the future seeks for employees who are able to lead in group works and be efficient in a team. The indecisiveness may be caused by the fact that while the goals for collaboration are clear, in reality, the interactions require individualization.

The Perception Scale of Using the CPS Skill reveals that the adults with previous project experience have positive perceptions for the factors of *collaborative communication* and

maintaining effective conversation. The greatest factor for an effective participation work is collaboration between professionals in interdisciplinary team meetings. The three essentials for an effective team work: (1) organized materials for presentation and time management, (2) active communication between members in order to obtain a mutual understanding of the goal and decisions of the group, (3) active participation of the members for a constructive problem-solving effort (Cooley, 1994). Therefore, it can be suggested that the communication gaps to arise in the collaboration process have a great impact on productivity of the group.

Researches indicate that communication skills of individuals affect the efficiency to be obtained from the project and the process of problem-solving (Porter and Lilly, 1996; Yüksel-Şahin, 2002). Çam (2016) reported that the perception of teachers for the problem-solving skill increases thanks to improved communication skills. Therefore, a good problem solver can be considered to have a good communication skill as well. The positive perception of the participants with project experience for collaborative communication can be considered as an indicator for that they are more experienced in conducting a project, in other words, for the selection of a suitable adult group for the research. It is possible to suggest that, considering the project completion experiences of the participant adults, they completed the projects thanks to the proper "*collaborative communication*" processes, and can start each further project better equipped with communication skills.

The perception scale of Using the CPS skill for adults with project experience reveals that they exhibit a positive perception for the factor of *maintaining effective conversation*. The fact that they have improved communication skills and know how to resolve conflicts can be the reason of this perception. Their positive reviews on the communication factor supports this explanation. Furthermore, that they ensured the project approval indicates that they have positive prior experience of communication.

It has been observed that the adults with project experience also exhibit indecisiveness for the dimension of *decision making based on personal opinions*. The reason of this indecisiveness in this sub-dimension of the communication skill can be that they bring along the experiences and beliefs they have gained all their life-long to the group work, and these opinions may collide with the beliefs and opinions of other group members (Alavi and McCormick, 2004; Alghamdi and Bach, 2018; Tekin, 2019). Individual differences caused by growing up with different emotions, ideas, standards of judgment and cultures can manifest themselves as communication obstacles (Ölçer and Koçer, 2015; Yazıcı and Gündüz, 2010). In a research, it was reported that experienced people have a lower number of consensuses in a group than inexperienced people so they have a lower possibility of agreement compared to the inexperienced (Nah and Benbasat, 2004). In other words, adults think they are more knowledgeable thanks to their experiences, and individuals want their opinion to receive acceptance, and difficulties in agreement thus may emerge. On the other hand, in-house communication is a requirement to be able to exchange ideas and make effective and proper decisions (Ölçer and Koçer, 2015). However, conflict of beliefs and clash of ideas can be experienced among group members working for a mutual goal as well. People with closer goals, opinions and values reach consensuses more, and this prevents the conflicts regarding both purpose and relationship (Jehn, Chadwick and Thatcher, 1997). Therefore, similar characteristic features, cultures, beliefs and values of individuals in groups can prevent conflicts and increase thus the group performance. In brief, the observed indecisiveness for decision making based on personal opinions may be related to the contradiction between the

difficulty in consensus developed by experience and maintaining the high-level tendency for group work.

Examining the perception of adults with project experience and students for using the CPS skill in comparison to COS levels, a significant difference between the adults with project experience and students was observed for both in favor of the adults. The adults with project experience exhibit more detailed and longer problem-solving, think more fluently, try to understand a problem more deeply by reviewing data, get rid of insolvable thoughts quickly, are more disciplined and more skeptical about provided information, clarify ambiguous points and benefit from the experiences of each other (Lewis and Sier, 1983). It was revealed that the adults with previous project experience put in a lot of effort during the management of group work and the exchange of the roles to be distributed between group members, but they put in less effort during evaluation, and paid more attention to details as well (Smith and Leong, 1998). The impact of this situation on the project stage explains the difference between BİLSEM students and the adults with previous project experience. In the researches made with experienced adults and the inexperienced, it was observed that the inexperienced tested more and focused on the mistakes, were unsure of their decisions due to lack of self-confidence, asked for advices from experienced people, and that experienced people focused more on strategies, changed approaches and united activities, and became inspired by their previous experiences and team works (Ahmed, Wallace and Blessing, 2003).

Furthermore, adults with previous project experience are capable to skip the first steps of a problem-solving process to a more progressed step while a fresh graduate or undergraduate is still in one of the first steps (Jackling, Lewis, Brandt and Sell, 1990). For example, a group composed of engineers experienced in their own field was observed to spend less time than the inexperienced to exchange ideas, identify and assess the problem regarding problem-solving. This may be stemming from the possibility that adults who have gained more experience in their business life are better at time management (Smith ve Leong, 1998).

Moreover, it was found out that experienced adults are more efficient than the inexperienced in organization and cognitive activities, and almost 3 times superior to experts in productivity and cognition as well (Kavaklı and Gero, 2003). Experienced adults solve complex problems more quickly and accurately than the inexperienced (Larkin, Mcdermott, Simon and Simon, 1980). This can be related to the fact that adults have more experience so as to recognize the importance of collaboration. Colaboration skill is a vital factor to successfully conduct a project. Furthermore, open communication between collaborative investigators and project participants with the same point of view has a direct positive impact on project works (Phua and Rowlinson, 2004).

The results reveal that the perception of adults with project experience for using the CPS skill in the project stage is more positive than the one of the BİLSEM students. By looking at the perception levels of the gifted students for using the CPS skill, this study helps to have a general opinion about the content of project works in which educational practices -differentiated and enriched in BİLSEM Guidelines, are provided, and the students find solutions to unusual problem in collaborative processes. However, comparison was carried out based on a realistic-normative measurement. The findings of this study are notable for revealing that the BİLSEM project stage has effectiveness-related deficiencies regarding the CPS skill, that it provides evidence for the suggestion that an identification for BİLSEM project stage (the stage with the

most important target outcomes) isn't employed, and that there are limitations to foster a productivity-enhancing collaboration for individuals with previous project experience.

Implications

Considering the implications of the findings of this research, the following suggestions can be made for further research.

Practical implications. The project works carried out in BİLSEMs require to be readdressed and revised in terms of the CPS skill. The social skills education and in-class group works fostering communication skills which are effective on group work collaboration of gifted students must be included more frequently. The gifted students can be provided with mentorship services in order to improve their social and cognitive skills by addressing the project stages in BİLSEM. Furthermore, the teachers of BİLSEMs are required to be provided with information on preparation and conducting stages of a project by both the Ministry of National Education and universities, and to be supported by specialist experts during the process. The gifted learners in BİLSEMs need to be introduced to activities to improve sub-dimensions of the CPS skill before the Project Production and Management stage, in the school years of BYF (Recognition of Individual Gifts) and ÖYG (Development of Individual Gifts). Assessments of student perception for the CPS skill must be carried out regularly. Considering the whole project stage in BİLSEMs, it is required to investigate the changes in the CPS skill of students and if this skill reach to the skill level of adults with project experience.

To sum up, opportunities must be created for skill development required in this area by providing more opportunities for group work. Students must have the classroom environment and activities to develop the sub-skills of respect for individual differences, taking active roles within work distribution, resolving conflicts, conveying opinions, sharing, supporting the ideas of others, coordinating the opinions of their own and others, evaluation of conflicting ideas and effective use of body language.

Suggestions for further research. Considering the sampling size and that the sampling of the participants is not accidental in this study, the research must be improved with an accidentally sampled group and a larger sampling size in the studies following this. Considering that the Perception Scale of Using the Collaborative Problem-Solving Skill employed in this study has a different factor structure for the adult participants with project experience from the one for the students, further research must employ measurement tools with the same factor structure. In this research, data was collected with measurement tools structured as self-reporting. In order to collect more extensive data, observation and interviews for the CPS skill must be engaged in further research. Based on the findings of the t-test performed for comparison in data analysis in this research, future studies can be conducted on prediction of the difference.

Ethical Statement

For this study, ethical approve of IRB in Institute of Educational Sciences in Hacettepe University was taken and consent form was applied to the participants. Only the participants approved the consent form, was involved in the study.

Potential Conflicts of Interest

There is no conflict among the authors of this paper.

References

Adams-Byers, J., Whitsell, S. S., & Moon, S. M. (2004). Gifted students' perceptions of the academic and social/emotional effects of homogeneous and heterogeneous grouping. *Gifted Child Quarterly, 48*(1), 7-20.

Aga, D. A., Noorderhaven, N., & Vallejo, B. (2016). Transformational leadership and project success: The mediating role of team-building. *International Journal of Project Management*, *34*(5), 806-818.

Ahmed, S., Wallace K. M., & ve Blessing, L. T. M. (2003). Understanding the differences between hoe novice and experienced designers approach design task. *Research in Engineering Design, 14*,1-11. http://doi.org/10.1007/s00163-002-0023-z

Akyol, A. A., Köseoğlu, S., Türkay, B. C., Kıdıman, E., & Özkan, H. (2015). Yasemin Karakaya Science and Art Center archaeology project. *Global Journal on Humanites & Social Sciences. [Online]. 1*, 453-461.

Alavi, B. S., & McCormick, J. (2004). Theoretical and measurement issues for studies of collective orienntation ın theam contexts. *Small Group Research, 35* (2), 111- 127. http://doi.org/10.1177/1046496403258499

Alghamdi, A., & Bach, C. (2018). Developing teamwork at workplace. *International Journal of Business and Management Invention (IJBMI), 7*(2), 28-40.

Barron, B. (2000). Achieving coordination in collaborative problem-solving groups. *The Journal of the Learnig Sciences, 9* (4), 403-436.

Burns, D. E., Johnson, S. E., & Gable, R. K. (1998). Can we generalize about the learning style characteristics of high academic achievers? *Roeper Review, 20*(4), 276–281. http://doi.org/10.1080/02783199809553907

Care, E., Scoular, C., & Griffin, P. (2016). Assessment of colloborative problem solving in education environments. *Applied Measurement in Education, 29*(4), 250-264. http://doi.org/10.1080/08957347.2016.1209204

Chan, D. W. (2001). Learning styles of gifted and nongifted secondary students in Hong Kong. *Gifted Child Quarterly, 45*(1), 35–44. http://doi.org/10.1177/001698620104500106

Cooley, E. (1994). Training an interdisciplinary team in communication and decision – making skills. *Small Group Research, 25*(1), 5 - 25.

Çam, S. (2016). İletişim becerileri eğitimi programının öğretmen adaylarının ego durumlarına ve problem çözme becerisi. *Türk Psikolojik Danışma ve Rehberlik Dergisi*, *2*(12). 16- 27.

Çetinkaya, C. (2013). Sakarya Science and Art Center nature education program. *Journal of Environmental Protection and Ecology, 14*(3A), 131-1324.

Çetinkaya, Ç., Maya-Çalışkan, İ., & Güngör, H. (2012). Classroom management problems derives from gifted and talented students' leadership qualities. *Sakarya Üniversitesi Eğitim Fakültesi Dergisi, 24*, 7-29.

Çitil, M., Ataman, A. (2018). İlköğretim çağındaki üstün yetenekli öğrencilerin davranışsal özelliklerinin eğitim ortamlarına yansıması ve ortaya çıkabilecek sorunlar. *Gazi Üniversitesi Eğitim Fakültesi Dergisi, 38*(1), 185-231.

Davier, A. A., Hao, J., Liu, L., & Kyllonen, P. (2017). Interdisciplinary research agenda in support of assessment of collaborative problem solving: Lessons learned from developing a collaborative science assessment prototype. *Computers in Human Behavior*, *76*, 631-640. http://doi.org/10.1016/j.chb.2017.04.05982014

Diffily, D. (2002). Project-based learning: meeting social studies standards and the needs of gifted learners. *Gifted Child Today, 25*(3), 40–59. http://doi.org/10.4219/gct-2002-69

Driskell, J. E., Salas, E., & Hughes, S. (2010). Collective orientation and team performance: Development of an individual differences measure. *Human Factors, 52*(2), 316-328. http://doi.org/10.1177/0018720809359522

Dunn, R. S., & Price, G. E. (1980). The learning style characteristics of gifted students. *Gifted Child Quarterly, 24(*1), 33-36. http://doi.org/10.1177/001698628002400107

Ellison, C. M., & Wade Boykin, A. (1994). Comparing outcomes from differential cooperatıve and individuaistic learning methods. *Social Behavior and Personality: An International Journal, 22*(1), 91-103. http://doi.org/10.2224/sbp.1994.22.1.91.7

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education.* (8th ed.). New York: The McGraw-Hill.

Galloway, B., & Porath, M. (1997) Parent and teacher views of gifted children's social abilities, *Roeper Review, 20*(2), 118-121, https://doi.org/10.1080/02783199709553872

Gardner, B. S., & Korth, S. J. (1998). A framework for learning to work in teams. *Journal of Education for Business, 74*(1), 28- 33. http://doi.org/10.1080/08832329809601657

Gillies, R. M. (2016). Cooperative learning: Review of research and practice. *Australian Journal of Teacher Education*, *41*(3), 39-54. http://doi.org/10.14221/ajte.2016v41n3.3.

Griggs, S. A., & Price, G. E. (1980). A comparison between the learning styles of gifted versus average suburban junior high school students. *Roeper Review, 3(*1), 7-9. http://doi.org/10.1080/02783198009552488

Grzimek, V., Marks, M. B., & Kinnamon, E. (2014) Do differences in GPA impact attitudes about group work? A comparison of business and non-business majors, *Journal of Education for Business, 89*(5), 263-273, http://doi.org/10.1080/08832323.2013.872591

Gu, X., Chen, S., Zhu, W., & Lin, L. (2015). An intervention framework designed to develop the collaborative problem-solving skills of primary school students. *Educational Technology Research and Development*, *63*(1), 143-159. http://doi.org/10.1007/s11423-014-9365-2

Hansen, R. S. (2006). Benefits and problems with student teams: suggestions for improving team projects. *Journal of Education for Business, 82*(1), 11–19. http://doi.org/10.3200/joeb.82.1.11-19

Hara, N., Solomon, P., Kim, S. L., & Sonnenwald, D. H. (2003). An emerging view of scientific collaboration: Scientists' perspectives on collaboration and factors that impact

collaboration. *Journal of the American Society for Information Science and Technology*, *54*(10), 952-965.

Hesse, F., Care, E., Buder, J., Sassenberg, K., & Griffin, P. (2015). A framework for teachable collaborative problem solving skills. Griffin, P. ve Care, E. (Ed.), *Assessment and teaching of 21st century skills, educational assessment in an information age* (37-56). New York: Springer. http://doi.org/10.1007/978-94-017-9395-7_2

Hooff, B., & Hendrix, L. (2004). Eagerness and willingness to share: The relevance of different attitudes towards knowledge sharing. *5. European Conference on Organizational Knowledge, Learning and Capabilities* konferansında sunulan bildiri. Innsbruck, Austria.

Hunt, B. (1996). The effect on mathematics achievement and attitude of homogeneous and heterogeneous grouping of gifted sixth-grade students. *Journal of Secondary Gifted Education*, *8*(2), 65-73.

İbrahim, C. K. I., Costello, S. B., & Wilkinson, S. (2011). Key relationship oriented indicators of team integration in construction projects. *International Journal of Innovation, Management and Technology, 2*(6), p. 441-446.

Işık, Ş. (2016). Psikolojik dayanıklılık ölçeğinin geliştirilmesi: Geçerlik ve güvenirlik çalışması. *The Journal of Happiness & Well-Being, 4* (2), 165-182.

Jackling, N., Lewis, J., Brandt, D., & Sell, R. (1990) Problem Solving in the Professions, *Higher Education Research & Development, 9*(2), 133-149. http://doi.org/10.1080/0729436900090205

Jehn, K. A., Chadwick, C., & Thatcher, S. M. (1997). To agree or not to agree: The effects of value congruence, individual demographic dissimilarity, and conflict on workgroup outcomes. *International Journal of Conflict Management*, *8*, 287-305.

Johnson, D. W., Skon, L., & Johnson, R. (1980). Effects of cooperative, competitive, and individualistic conditions on children's problem-solving performance. *American Educational Research Journal, 17*(1), 83-93.

Johnson, R. T., & Johnson, D. W. (1988). Cooperative learning and the gifted science student. P. F. Brandwein & A. H. Passow (Eds.), *Gifted young in science* (321-329). Washington: National Science Teachers Association.

Johnston, C. G., James, R. H., Lye, J. N., & McDonald, I. M. (2000). An evaluation of collaborative problem solving for learning economics. *Journal of Economic Education 31*(1), 13-29. http://doi.org/10.1080/00220480009596758

Karademir, E. (2016). Investigation the scientific creativity of gifted students through project-based activities. *International Journal of Research in Education and Science (IJRES), 2*(2), 416-427.

Kavaklı, M., & Gero, J. S. (2003). Strategic knowledge differences between an expert and a novice designer. Lindemann U. (Ed.)*, Human behaviour in design: Individuals, teams, tools*.(42-52). Berlin: Springer.

Kılıç, S. (2016). Cronbachs alpha reliability coenfficient. *Journal of Mood Disorders (JMOOD), 6* (1). 47-48.

Kılınç, A., Koç-Şenol, A., Eraslan, M., & Büyük, U. (2013). Robotik destekli fen öğretimi: BİLSEM örneği. *Internatıonal Symposium on Changes and New Trends in Education,* 65-75.

Koç, E. M. (2018). Yabancı Dil olarak İngilizcenin Öğretildiği Sınıflarda Grup Aktivite Odaklı İşbirlikçi Öğrenmenin İncelenmesi*, İnonu University Journal of the Faculty of Education, 19*(3), 582-597. http://doi.org/10.17679/inuefd.385741

Köse, S. ve Sayar, K. (Unpublished data, 2001). MCSDS- Tuskish (Marlowe-Crowne sosyal arzulanırlık ölçeği- MCSAÖ).

Kwon, K., Song, D., Sari, A. R., & Khikmatillaeva, U. (2017). Different types of collaborative problem-solving processes in an online environment: Solution oriented versus problem oriented. *Journal of Educational Computing Research*. *0*(0) 1–19. http://doi.org/10.1177/07356331177403955

Larkin, J., Mcdermott, J., Simon D. P., & Simon, H. A. (1980). Expert and novice performans in solving physics problems. *Science, 208*(4450), 1335-1342.

Layman, L. (2006). Changind students's perceptions: an analysis of the supplementary benefits of collaborative software development. *In 19th conference on Software Engineering Education & Training (CSEET'06),* 159-166. IEEE.

Leroux, J. A. (1997). A secondary school journey: Programming for gifted students at a Catholic high school in Canada. *Gifted Education International, 12*(2), 72–76. https://doi.org/10.1177/026142949701200205

Lewis, W. P. ve Sier, G. H. (1983). The diagnosis of plant failure: A comparison of student and professional engineers. *IEEE Transactions on Engineering Management*, (1), 12-17.

Li, C. H., & Liu, Z. Y. (2017). Collaborative problem-solving behavior of 15-year-old taiwanese students in science education. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(10), 6677-6695. http://doi.org/10.12973/ejmste/78189

Lin, K. Y., Yu, K. C., Hsiao, H. S., Chu, Y.H., Chang, Y. S., & Chien Y. H. (2015). Design of an assessment system for collaborative problem solving in STEM education. *Journal of Computer in Education, 2*(3), 301-322. http://doi.org/10.1007/s40692-015-0038-x

Luckin, R., Baines, E., Cukurova, M., Holmes, W., & Mann, M. (2017). *Solved! Making the case for collaborative problem-solving.* UK: Nesta.

Markusic, M. (2012, 23 Eylül). *Disciplining gifted children*. Bright Hub Education. http://www.brighthubeducation.com/teaching-gifted-students/49993- ..disciplining-bad-behavior-in-gifted-children/ adresinden erişilmiştir.

Marsh, H. W., Chessor, D., Craven, R., & Roche, L. (1995). The effects of gifted and talented programs on academic self-concept: The big fish strikes again. *American Educational Research Journal*, *32*(2), 285-319.

McCorkle, D. E., Reardon, J., Alexander, J. F., Kling, N. D., Harris, R. C., & Iyer, V. (1999). Undergraduate marketing students, group projects, and teamwork: The good, the bad, and the ugly? *Journal of Marketing Education, 21*(2), 106- 117.

Michaels, J. W. (1977). Classroom reward structures and academic performance. *Review of Education Research, 47*(1), 87-98.

Mo, J. (2017). *Collaborative problem solving: PISA in focus 78*, OECD Publishing. https://doi.org/10.1787/cdae6d2e-en

Nacaroğlu, O., & Arslan, M. (2019). Bilim ve sanat merkezlerinde yürütülen proje çalışmalarına ilişkin öğrenci görüşlerinin değerlendirilmesi. *Eğitimde Kuram ve Uygulama, 15*(3), 220-236. https://doi.org/10.17244/eku.581804

Nacaroğlu, O., Arslan, M., & Bektaş, O. (2019). Bilim ve Sanat Merkezleri'nde yürütülen proje çalışmalarına ilişkin öğretmen görüşlerinin değerlendirilmesi. *Asian Journal of Instruction, 7*(2), 1-21.

Nah, F. F. H., & Benbasat, I. (2004). Knowledge-based support in a group decision making context: An expert-novice comparison. *Journal of the Association for Information Systems*, *5*(3), 125-150.

OECD (2017), PISA 2015 *assessment and analytical framework: science, reading, mathematic, financial literacy and collaborative problem solving.* (revised ed.). OECD Publishing. https://doi.org/10.1787/9789264281820-en

OECD (2017), *PISA 2015 results (Volume V): Collaborative problem solving*. OECD Publishing.

Ölçer, N., & Koçer, S. (2015). Örgütsel iletişim: Kocaeli Üniversitesi akademik personel üzerine bir inceleme. *Global Media Journal TR Edition, 6*(11), 339-383.

Özarslan, M. (2015). *Proje paydaşlarının bilsem biyoloji projeleri hakkındaki düşünceleri ve bu projelerin üstün zekâlı ve yetenekli öğrencilerin biyoloji öğrenmeye yönelik motivasyonları ile bilimsel tutumlarına etkisi*. Yayınlanmamış Doktora Tezi. Balıkesir Üniversitesi Fen Bilimleri Enstitüsü, Balıkesir. Türkiye.

Özaraslan, M., & Çetin, G. (2018). Effects of biology project studies on gifted and talented students' motivation toward learning biology. *Gifted Education International, 34*(3),1-17. https://doi.org/10.1177/0261429417754203

Öztürk-Akar, E., & Ayvaz, Ü. (2018). Üstün yetenekli çocuklar neden bir bilim okulu projesine katılmak ister? *Milli Eğitim Dergisi, 47(*Özel Sayı 1), 333-342.

Phua, F. T. T., & Rowlinson, S. (2004). How important is cooperation to construction project success? Agrounded emprical quantification. *Engineering Constructions & Architectural Managment, 11*(1), 45-54. http://doi.og./10.1108/09699980410512656

Piechowski, M. M. (2009). The inner world of the young and bright. Ambrose, D., Cross, T. (Ed.) *Morality, ethics, and gifted minds* (177-194). New York: Springer. https://doi.org/10.1007/978-0-387-89368-6

Porter, L. (2005). *Gifted young children: A Guide for parents and teachers*. (2nd ed.). Singapore: South Wind Production.

Porter, T. W., & Lilly, B. S. (1996). The effects of conflict, trust, and task commitment on project team performance. *International Journal of Conflict Management, 7*(4), 361–376. http://doi.org/10.1108/eb022787

Rimm, S., Siegle, D., & Davis, G. (2018) *Education of the gifted and talented*. New York: Pearson.

Qin, Z., Johnson, D. W., & Johnson, R. T. (1995). Cooperative versus competitive efforts and problem solving. *Review of Educational Research*, *65*(2), 129-143.

Rayneri, L. J., Gerber, B. L., & Wiley, L. P. (2006). The relationship between classroom environment and the learning style preferences of gifted middle school students and the impact on levels of performance. *Gifted Child Quarterly, 50*(2), 104-118.

Repinc, U., & Južnič, P. (2013). Guided inquiry projects: Enrichment for gifted pupils. *School Libraries Worldwide,19*(1), 114-128.

Rosen, Y. ve Foltz, P. W. (2014). Assessing collaborative problem solving through automated technologies. *Research and Practice in Technology Enhanced Learning,9*(3),389－410.

Roseth, C. J., Johnson, D. W., & Johnson, R. T. (2008). Promoting early adolescents' achievement and peer relationships: The effects of cooperative, competitive, and individualistic goal structures. *Psychological Bulletin*, *134*(2), 223-246. https://doi.org/10.1037/0033-2909.134.2.223

Sak, U. (2004). A synthesis of research on psychological types of gifted adolescents. *Journal of Secondary Gifted Education, 15*(2), 70–79. http://doi.org/10.4219/jsge-2004-449

Sak, U. (2013). *Üstün zekâlılar.* Ankara: Vize Yayıncılık.

Saranlı, A. G., & Metin, N. (2012). Social-emotional problems observed in gifted children. *Ankara University Journal of Faculty of Educational Sciences*, *45*(1), 139-163.

Scarnati, J. T. (2001), On becoming a team player. *Team Performance Management, 7*(1/2), 5-10. https://doi.org/10.1108/13527590110389501

Sezer, Ş. (2015). Üstün yeteneklilerin sınıf içindeki olumsuz davranışlarıve yönetilmesine ilişkin öğretmen görüşleri. *Uluslararası Türk Eğitim Bilimleri Dergisi,4,* 317-333.

Sharma, S. (1996). *Applied multivariate techniques*. John Wiley.

Slavin, R. E. (2014). Cooperative learning and acedemic achievement: Why does groupwork work? *Anales De Psicologia, 30*, 785-791. https://doi.org/10.6018/analesps.30.3.201201

Smith, R. P., & Leong A. (1998). Design team process. A comparison of student and professional engineers. *The American Socirty of Mechanical Engineers, 120,* 636-642.

Steiner, I. D. (1966). Models for inferring relationships between group size and potential group productivity. *Behavioral Science*, *11*(4), 273-283.

Scoular, C., Care, E. & Hesse, F. W. (2017). Designs for operationalizing Collaborative Problem Solving for Automated assessment. *Journal of Education Measurement, 54(*1), 12-35.

Storch, N. (2005). Collaborative writing: product, process, and students' reflections. *Journal of Second Language Writing, 14*(3), 153-173.

Su, Ş. (2019). TÜBİTAK 4004 kapsamında yürütülen "Özel Yetenekliler Arkeoloji İle Tarihe Dokunuyor" projesinin değerlendirilmesi. *İnformal Ortamlarda Araştırmalar Dergisi, 4*(2), 117-143.

Şahin, E., Kabasakal, V., & Çelebi, Ö. (2019) informal öğrenme ortamlarında gerçekleştirilen bilim eğitimlerine yönelik özel yetenekli öğrencilerin görüşleri. *2. Uluslararası Temel Eğitim Kongresi,* 81-90.

T.C. Milli Eğitim Bakanlığı (MEB) (2019). Bilim sanat merkezleri yönergesi. *Millî Eğitim Bakanlığı Tebliğler Dergisi, 2747* (82). 391-419. http://mevzuat.meb.gov.tr/dosyalar/2039.pdf

Tarricone, P., & Luca, J. (2002), Employees, teamwork and social interdependence- a formula for successful business?. *Team Performance Management: An International Journal, 8*(3/4), 54-59. https://doi.org/10.1108/13527590210433348

Tatık, R. Ş., & Ayçiçek, B. (2020). Bilimsel araştırma projesi (BAP) yürütücülerinin proje deneyimleri üzerine nitel bir çalışma. *OPUS–Uluslararası Toplum Araştırmaları Dergisi,15*(21), 659-685. http://doi.org/10.26466/opus.630564

Tavşancıl, E. (2002). Tutumlarin ölçülmesi ve SPSS ile veri analizi [Measurement of attitudes and data analysis with SPSS]. Ankara: Nobel Yayinlari.

Tekin, E. (2019). *İlkokullarda çalışan öğretmenlerin yöneticileriyle iletişimlerine dair algıları (Çal ilçe örneği).* (Yüksek lisans projesi). Pamukkale Üniversitesi, Denizli.

Tekin, H. (2002). E*ğitimde ölçme ve değerlendirme*. Ankara: Yargı Yayıncılık.

Tekin, Y. T. (2019). *2015 PISA iş birlikli problem çözme becerilerinin ülkelere göre ölçme değişmezliğinin incelenmesi: Türkiye, Norveç, Singapur* (Yüksek lisans ttezi). Hacettepe Üniversitesi, Ankara.

Trilling, B., & Fadel, C. (2009). 21st century skills learning for life in our times. John Wiley & Sons.

Wagner III, J. A. (1995). Studies of individualism-collectivism: Effects on cooperation in groups. *Academy of Management Journal*, *38*(1), 152-173.

Wang, H. Y., Huang, I., & Hwang, G. J. (2014). Effects of an integrated scratch and project-based learning approach on the learning achievements of gifted students in computer courses. *2014 IIAI 3rd International Conference on Advanced Applied Informatics.* 382-387. http://doi.org/10.1109/iiai-aai.2014.85

Vésteinsdóttir, V., Reips, U. D., Joinson, A., & Thorsdottir, F. (2015). Psychometric properties of measurements obtained with the Marlowe–Crowne Social Desirability Scale in an Icelandic probability based Internet sample. *Computers in Human Behavior*, *49*, 608-614.

Yazıcı, Ö., & Gündüz, Y. (2010). Etkili eğitim denetiminde yaşanan iletişim engelleri ve bu engelleri aşma yolları. *Kuramsal Eğitimbilim,3*(2), 37-52.

Yazıcı, H. J. (2004). Student perceptions of collaborative learning in operations management classes. *Journal of Education for Business, 80*(2), 110-118. https://doi.org/10.3200/joeb.80.2.110-118

Yusuf, B. N. B. M., & Anuar, S. N. B. S (2014). The effects of conflicts handling in teamwork of hotel industry located in northern region of Malaysia. *Journal of Asian Scientific Research, 4*(11), 603-617.

Yüksel-Şahin, F. (2002). Yönetici adaylarının mantıklı karar verme ve problem çözme beceri düzeylerinin incelenmesi. *Eğitim ve Bilim*, *27*(125). 8-16.

Exploration of the Relationship Between Autism Spectrum Disorder (ASD) and Avoidant/Restrictive Food Intake Disorder (ARFID): A Literature Review

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Abstract

The purpose of this literature review was to provide a comprehensive summary of the relationship between Autism Spectrum Disorder (ASD) and Avoidant/Restrictive Food Intake Disorder (ARFID). Eight research studies published between the years 2012 and 2022 were included in the review. The studies examined various symptoms, risk factors, comorbidities, treatment options, and the prevalence of ARFID among children diagnosed with ASD. Overall, results suggested a strong correlation between having an ARFID diagnosis if already diagnosed with ASD. Additionally, it is more common to be diagnosed with ARFID in children of younger age and/or male. Potential treatment options for children dealing with ARFID are differential reinforcement alternate behaviors (DRA), various schedules of reinforcement, and treating the disorder as a resistance to change, not an eating disorder. Future research should be continued to further explain the characteristics of ARFID and find additional treatment options for children dealing with ARFID with and without an ASD diagnosis.

Exploration of the Relationship Between Autism Spectrum Disorder (ASD) and Avoidant/Restrictive Food Intake Disorder (ARFID): A Literature Review

Children living with Autism Spectrum Disorder (ASD) frequently have to deal with the accompanying side effects of their diagnosis every day. ASD is defined as a developmental disorder characterized by impairments in communication, social interactions, sensory input, and repetitive behaviors (Cermak et al., 2014). In 2021, it was reported by the CDC that 1 in 44 children have an ASD diagnosis, according to data collected in 2018 (CDC). Issues with sensory input can come in the form of difficulty accepting physical touch, smells, sounds, or tastes. Food aversion and/or food sensitivity occurs when an individual has sensory issues with consuming, smelling, or seeing certain foods (Lucarelli, 2017).

Avoidant/restrictive food intake disorder (ARFID) is a type of eating disorder recognized in the DSM-5 that has no age restriction and is distinct from other eating disorders with body image disturbances (Zimmerman et al., 2017). ARFID has many subcategories of eating disorders that fall under this umbrella term, including food avoidance, food-related emotional disorders, selective eating, functional dysphagia, pervasive refusal syndrome, and many others. Food aversion is defined as a strong dislike for a particular food where the sight, smell, or taste of said food causes an individual to feel sick and/or gag (Mayo Clinic, n.d.). Food selectivity can be defined as "comprising 3 separate domains: food refusal, limited food repertoire, and high-frequency single food intake (HFSFI)" (Bandini et al., 2010, p. 259).

Limited food intake can negatively impact a child's health in a number of different ways. The child could become malnourished due to a lack of variety in foods, or they could face other medical challenges due to their limited diet. This could be in the form of anemia, gastrointestinal disorders (GID), stomach issues like constipation, and vitamin or mineral deficiencies (Cermak et al., 2014). Any of these issues can be challenging for children with ASD, and understanding, correcting, and potentially preventing these eating habits could be extremely beneficial to children with autism. The purpose of this literature review was to investigate the relationship between ARFID and children diagnosed with ASD in order to identify potential treatment options.

Literature Search Procedures

The following search procedures were used to retrieve relevant studies. First, a computer-assisted search of three major databases was conducted, including *PsycINFO*, *PubMed*, and the *Psychology and Behaviors Sciences Collection*. The descriptors used in the search procedures included autism spectrum disorder, ARFID, children, eating behaviors, food sensitivity, eating disorders, and mealtime anxiety. Based on these searches, eight studies were identified that fit the inclusion criteria for the review.

Overall Characteristics of the Data Set

Criteria for Inclusion

The studies included in this literature review were located in *Child & Family Behavior Therapy*, *Developmental Medicine & Child Neurology*, *Journal of Applied Behavior Analysis*, and the *Journal of Developmental & Behavioral Pediatrics*. For this review, the following inclusion criteria were utilized: (a) empirical studies were published between 2012 and 2022; (b) (c) the studies were published in a peer-reviewed scientific journal; (d) participants were younger than 18 years old; (d) participants had an ASD diagnosis; (e), and the participants had a restrictive diet severe enough to influence day-to-day life and/or nutritional health. Studies were excluded if the participants were over the age of 18, if participants did not have an ASD diagnosis or possessed ASD-related symptoms, if participants did not have a restrictive diet that influenced nutritional health and/or everyday life, if the article was published before the year 2012, or if the article was not scientific in nature. Some studies used comparison groups that included children who did not have an ASD diagnosis; however, they did compare results to a group of children with ASD. Therefore, these articles were included in the literature review.

Sample

A total of 5,828 participants were included in the eight studies. The age range of children was from 1 to 18 years of age. The majority of the participants were male, and all participants were clinically diagnosed with ASD or showed multiple ASD symptoms.

Research Design

Of the eight articles included in the literature review, four utilized a single-subject design that followed a single participant over a given period of time (Bloomfield et al., 2021; King et al., 2022; Lucarelli et al., 2017; Taylor et al., 2020). For the remaining four studies, multiple-element

designs were used to look at a number of different variables (Crowley et al., 2020; Farag et al., 2021; Inoue et al., 2021; Koomar et al., 2021).

Intervention Descriptions

Risk Factors, Genetics & Comorbidities

Three of the eight articles included in this literature review looked into possible risk factors, genetic correlations, and comorbidities associated with an ARFID diagnosis. Farag et al. published an article in 2021 that investigated the neurodevelopmental presentations of eating behaviors in children with and without an ASD diagnosis. These investigations were completed in an attempt to make standardized assessments for children experiencing difficulty with food and eating. A total of 536 participants were recruited from a tertiary feeding clinic in a children's hospital between the years 2013 and 2019. Variables were extracted from patient records and statistically analyzed by the researchers. After collecting all of the data, it was determined that 49% of the children in this study met ARFID diagnostic criteria. Additionally, relationships between ARFID, age, nutritional inadequacy, and autism were discovered. Specifically, it was determined that ARFID is more common in children of younger ages, and ARFID is more common to accompany an ASD diagnosis than not. Additionally, younger children are more likely to have nutritional inadequacies that influence the overall health and growth of the child.

Inoue et al. (2021) also investigated the prevalence of ASD diagnoses in children with eating disorders, specifically ARFID (2021). The purpose of this study was to examine autistic traits in a cohort of children diagnosed with ARFID. A total of 124 children were included, with 32 having a clinical ARFID diagnosis. The children were recruited from the Japanese Pediatric Eds Outcome: a Prospective Multicenter Cohort Study (J-PED). The J-PED recruited participants from 11 medical institutions throughout the country.

The prevalence of ASD traits was investigated via the Autism Spectrum Quotient Children's version (AQC) and the Children's Eating Attitudes Test (ChEAT26) (Inoue et al., 2021). The AQC is a screening instrument completed by parents that assesses traits of autism in children ranging from ages six to fifteen years old. The ChEAT26 is a 26-question questionnaire assessing eating habits and attitudes in children also completed by parents. Of the 32 children diagnosed with ARFID in this study, more than 12% also had an ASD diagnosis. There was a significant correlation found between AQC scores and ChEAT26 scores, meaning ASD traits were commonly found in children with higher ChEAT26 scores (or children with more aversion to food and eating). The overall findings of this study revealed that there is a high prevalence rate of ASD in children with ARFID. Therefore, clinicians and practitioners need to be aware of these rates when working with children who fall under this category and educate themselves on how to properly treat children with either or both of these diagnoses.

Similar to the two studies above, Koomar et al. examined the prevalence and risk factors of ARFID in children diagnosed with ASD. Unlike these two studies, this study investigated genetic risk factors associated with ARFID in a large autism cohort (Koomar et al., 2021). A total of 5,157 children were included in this study after being recruited from the nationwide SPARK study via a research match. The SPARK study recruited participants via a nationwide multi-pronged social media strategy (SPARK, 2018). Of the total population, over 80% were

male, and the mean age of participants was 11 years old. Additionally, nearly 85% of the participants' race were white.

The Nine-Item ARFID Screen (NIAS) was used to collect data on the individuals and their eating habits/preferences, including the level of appetite, emotional relationships with food, and typical eating habits in the past. NIAS scores were used to identify individuals at high risk of having an ARFID diagnosis. In addition to the NIAS, supplementary questionnaires, genetic testing, and hereditary investigations were used to collect data on each participant to be further explored. Overall, it was determined that 21% of children diagnosed with ASD in this population were at risk for developing ARFID. One specific gene, ZSWIM6, a neurodevelopmental gene previously associated with other neurological conditions, had a genetic hit in the individuals showing ARFID symptoms. This was the first published evidence showing a relationship between genetic markers and the prevalence of ARFID.

All three of these studies investigated the risk factors, comorbidities, and potential genetic markers associated with ASD and ARFID. From these articles, it is possible that there is a relationship between ASD and ARFID, as well as correlations between age, nutritional status, and neurodevelopmental comorbidities. These three studies show strong evidence supporting this relationship; therefore, further research is necessary to better understand the connection between ASD and ARFID.

Treatment Options

The next three articles included in this literature review investigated potential treatment options for children diagnosed with ASD and ARFID. Lucarelli et al. (2017) published an article after completing a study investigating the treatment of a child with ASD and ARFID. Kendra, a four-year-old diagnosed with ASD and ARFID at age three, was referred to a feeding clinic due to feeding problems. At infancy, she was diagnosed with Gastroesophageal Reflux Disease (GERD) and multiple food allergies. At the time of the study, Kendra was only eating the following foods: french fries, Ritz crackers, pretzels, and soy-based formula. She had a history of controlling aspects of feeding, including only drinking out of a specific cup or only parking in a specific parking spot at the fast-food restaurant.

The feeding therapy program Kendra was in attempted to make feedings into a 'food game' where she was rewarded for improvements and trying new foods. The program directors attempted to increase water consumption each day, limit between-meal snacking and refuse specific food demands Kendra would make (Lucarelli et al., 2017). Through the use of systematic desensitization and schedule of rewards, Kendra attempted to lick new foods without gagging and started to sip on water. After a short amount of time, Kendra's parents decided to discontinue services due to the treatment being 'too harsh.' After discontinuing services, Kendra stopped eating pretzels and began acting out behaviorally. The changes in Kendra's eating habits and behaviors after the discontinuation of services show that this could be a potentially effective treatment method for children with ASD and ARFID for increasing food diversity and intake.

Like the above study, Crowley et al. (2020) investigated possible treatment methods for children diagnosed with both ASD and ARFID (2020). This study included seven children whom all experienced rigid and selective food consumption and attempted to treat these issues as

'resistance to change.' The children were given a choice between a change-resistant and an alternative food during free-choice and asymmetrical-choice conditions. Preferred items were used as reinforcement to increase alternative-food consumption during free- and asymmetrical-choice conditions. If needed, children were guided to put the alternative food in their mouths to initiate food consumption. The use of single-choice contingencies gave the child the opportunity to make their own decisions and potentially receive rewards in a safe, non-threatening environment. These improvements in feeding habits were generalized to other environments and with other alternative foods following the completion of the study. Eventually, the children no longer needed single-choice opportunities when choosing foods. This was an important finding because it most closely imitated typical mealtime contexts that would come up on a daily basis. From this study, it can be concluded that using single-choice options with rewards and consequences could improve food consumption (both quantity and quality) in children diagnosed with ARFID.

Another treatment option was investigated as a possible treatment for ARFID by Taylor et al. (2020) that focused on improving and maintaining chewing skills. A four-year-old boy named Junot, who had never chewed or eaten regularly textured foods, was diagnosed with ARFID. His parents were seeking treatment options to improve his eating habits and help with other medical conditions he was experiencing such as low weight, iron deficiency, and constipation. A paired stimulus edible preference assessment was conducted, and the child's iPad and new toys were used as tangible rewards.

Prior to introducing chewing, a treatment evaluation was conducted to increase lower texture variety, texture, and volume using a reversal design (Taylor, 2020). They slowly introduced new textures and prompted chewing after determining that Junot had the physical ability to chew and swallow foods. Junot quickly started to chew and swallow a number of different food types and textures. After three weeks of behavior treatment, Junot was eating over 100 different foods, including some meats, raw fruits, and raw vegetables. Junot meet 100% of his goals, and his parents were very satisfied with his progress. Based on his improvements and the changes to his eating habits, it is probable to use preference assessments in addition to a schedule of rewards and reinforcement as a treatment option for ARFID.

All three studies above investigated potential treatment methods for children dealing with ARFID. Each study utilized rewards and reinforcement for improvements to eating behaviors, although they each used different teaching techniques for improving food consumption. Each of the above treatment techniques saw positive results in terms of treating ARFID in children diagnosed with ASD. Research should be continued in an attempt to get a better idea of each of these treatment methods.

In today's society - with the pandemic and more families working from home - it is not always probable for a family member to get their child into a clinical setting to receive treatment for difficult diagnoses like ARFID. For this reason, possible forms of treatment utilizing telecommunication should be explored as well as conventional treatments in a clinic or office. These treatment options could be delivered by a parent or a traveling professional and take place in the home.

Teleconsultation as a Form of Treatment

Telecommunication has become increasingly more common over the last few years and continues to be utilized in a post-pandemic America. Bloomfield et al. (2021) published a study that explored how parent teleconsultation can be used to potentially increase the number of bites consumed by a child diagnosed with ARFID and ASD. Jennifer was a five-year-old female who consumed low levels of fruits, vegetables, and fiber. A series of changing-criterion designs was conducted across approximations of target food consumption behaviors including touching, holding, kissing, licking, biting, and consuming foods.

Escape baseline was used to identify the starting point for intervention across foods before introducing differential reinforcement of alternative behaviors (DRA) and demand fading. These techniques were taught over teleconsultation meetings between the researcher and the mother and implemented at home between the mother and the child. Parent training was necessary because parent behaviors can unintentionally contribute to the development and maintenance of pediatric feeding habits (Bloomfield et al., 2021). Behavior Skills Training (BST) was used to teach the parent how to implement a discrete-trial training program across multiple targets to manage the child's challenging behavior with feedings. Overall, the parent had to implement differential reinforcement, prompting, and data collection procedures. The child was given the power to choose what 'problem' foods they wanted to try during each session and the parent recorded their actions and reactions to each of the problem foods while providing reinforcements and prompts when needed.

Overall, Jennifer was successful with 98.73% of trials and the frequency of compliance was improved over time (Bloomfield et al., 2021). These results supported two separate ideas: that teleconsultation may be used to teach caregivers how to implement potential treatment options for ARFID and that differential reinforcement of alternative behaviors can improve a child's food intake and variety.

The following year, King et al. (2022) conducted a study to investigate teleconsultation as a delivery option for the treatment of ARFID. Chris, a 17-year-old male diagnosed with ASD and ARFID, had a history of food avoidance and restricted eating due to the taste, smell, and texture of foods. The researchers attempted to educate Chris's mother on how to deliver differential reinforcement and contingency management procedures with Chris in an attempt to improve the quantity and diversity of foods he would eat.

A food preference survey was completed by Chris in an attempt to increase his motivation for treatment. The survey had three food groups with more than ten food options in each food group. Chris had to rate each food on a 5-point scale (1= strong dislike; 5 = strong like) and the lowest rated three foods would be used in the study (King et al., 2022). These included bananas, green beans, and water. His mother implemented differential reinforcement of alternative behaviors (DRA) when Chris showed interest in one of the target foods and earned money for eating the target foods. Chris' problem behaviors decreased over time and his consumption of the three target foods increased over time. These results showed that treatment options may be taught via telecommunication techniques and appropriately implemented to improve eating habits of an individual with ARFID.

Both studies by Bloomfield et al. (2021) and King et al. (2022) investigated the mechanics and success of providing treatment for ARFID via telecommunication in children diagnosed with ASD. Both resulted in improvements to eating habits and decreases in problem behaviors associated with feeding. Teleconsultation continues to rise in popularity, therefore, continuing to investigate the best possible ways to treat ARFID via this delivery form is needed in the future.

Discussion

Of the eight studies included in this literature review, all presented positive findings in terms of the relationship between ARFID and ASD and potentially useful treatment options. Because ARFID has only been recognized under the most recent publication of the Diagnostic and Statistical Manual of Mental Disorders (5th edition), there is limited publication on the topic. Specifically, the prevalence of ARFID in children also diagnosed with ASD is an important topic to investigate because difficulties with eating are commonly found in children with sensory issues (Koomar et al., 2021). The above studies found that there is a positive relationship between ARFID and ASD. Although there are many different reasons why a child might develop ARFID (i.e., avoidance, aversions, sensory difficulties, etc.), many of the reasons are common difficulties associated with ASD (Inoue et al., 2021).

Additionally, the majority of the participants experiencing ARFID symptoms were younger in age. ASD is commonly diagnosed in the younger years, so it's logical that ARFID symptoms are commonly discovered around that age as well. It is important to address concerns about eating at a young age because restricted eating habits can influence a child's growth, overall health, and mental well-being (Inoue et al., 2021). It is also important to address these concerns at a younger age because early intervention is key to preventing lifelong issues with food and eating.

There were also some genetic factors linked to the prevalence of ARFID in children with ASD (Koomar et al., 2021). Specifically, the gene ZSWIM6 (a neurodevelopmental gene previously linked to neurological conditions) was identified in children with ARFID. This was the first time a genetic marker was found in relation to ARFID and should be further investigated to better understand the relationship.

In terms of treatment options, three studies utilized schedules of reinforcements and rewards to encourage children to widen the variety of foods they would eat. By taking small steps and starting with smelling, licking, or kissing the foods, the child can become familiarized with something new and have the opportunity to slowly change their behavior. More specifically, a differential schedule of reinforcement of alternative behaviors (DRA) is a way of rewarding alternative, good behaviors while attempting to put problem behaviors into extinction (Bloomfield et al., 2021). This is an easily teachable option that can be executed by parents or caregivers in the home setting.

Of the various treatment options explored in this literature review, two utilized telecommunications (Bloomfield et al, 2021); (King et al., 2022). This was done by having the researchers teach family members how to implement the treatment options at home and watching via Zoom or some other technological format to ensure it was being done correctly. Both of these studies saw successes with teleconsultations and DRA when implemented by caregivers. More

specifically, having family members implement the treatment protocols saw positive results in diversifying the different types of foods eaten and in what quantity.

One limitation of this literature review is the small sample size of publications available at this time. Because ARFID has only been recognized as an eating disorder for a very short time, there is not a lot of research conducted on ARFID or its relationship to other diagnoses like ASD. Another limitation of this literature review is the fact that some of the studies utilized surveys or questionnaires. These forms of data collection are not the most reliable and leave room for dishonesty, misinformation, or instances of poor self-evaluation (GCU, n.d.). For this reason, those studies should be evaluated accordingly, and their results generalized when applicable.

Based on the limitations listed above, future research should be conducted to better understand ARFID and its characteristics. More research can help solidify the relationship between ARFID and ASD, as well as explore the other comorbidities ARFID can be seen with. Future research should also use questionnaires or surveys in addition to more reliable forms of data collection that use qualitative research methods. This could help to provide better, more reliable evidence of the causes, symptoms, and possible treatment(s) of ARFID. Recognizing these relationships makes it possible for early detection and intervention of the two, ensuring the child does not have long-term side effects of ASD and/or ARFID.

Conclusion

Autism Spectrum Disorder, or ASD, is a developmental disorder that typically has accompanying sensory issues that can be related to food intake and eating habits (Cermak et al., 2010). ARFID, or Avoidant Restrictive Food Intake Disorder, is an eating disorder that can show as food avoidance, aversive food reactions, or fear of food (Zimmerman et al., 2017). The relationship between ASD and ARFID is new, and research on the topic needs to be continued, as well as possible treatment options for children dealing with these diagnoses. After reviewing eight different articles, it was found that ARFID is most common in younger children diagnosed with ASD. At this time, there have been successful treatments for ARFID in the form of differential reinforcement, schedules of reinforcement, and contingency management procedures. Because the recognition of ARFID as a distinct diagnosis is so new, research should be continued to best understand all aspects of this disorder and to provide the best possible care to children dealing with difficult eating habits on a daily basis.

References

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed.

Bandini et al. (2010). Food selectivity in children with Autism Spectrum Disorders and typically developing children. *The Journal of Pediatrics, 157, 259-264.*

Bloomfield, B. S., Fischer, A. J., Dove, M., Clark, R. R., & Fife, M. (2021). Parent teleconsultation to increase bites consumed: A demonstration across foods for a child with ARFID and ASD. *Behavior Analysis in Practice*, *14*(4), 913–926. https://doi.org/10.1007/s40617-021-00586-4

Cermak, S. A., Curtin, C., & Bandini, L. (2014). Sensory sensitivity and food selectivity in children with Autism Spectrum Disorders. *Comprehensive Guide to Autism*, 2061–2076. https://doi.org/10.1007/978-1-4614-4788-7_126

Crowley, J. G., Peterson, K. M., Fisher, W. W., & Piazza, C. C. (2020). Treating food selectivity as resistance to change in children with Autism Spectrum Disorder. *Journal of Applied Behavior Analysis*, *53*(4), 2002–2023. https://doi.org/10.1002/jaba.711

Farag, F., Sims, A., Strudwick, K., Carrasco, J., Waters, A., Ford, V., Hopkins, J., Whitlingum, G., Absoud, M., & Kelly, V. B. (2021). Avoidant/restrictive Food Intake Disorder and Autism Spectrum Disorder: Clinical implications for assessment and management. *Developmental Medicine & Child Neurology*, *64*(2), 176–182. https://doi.org/10.1111/dmcn.14977

Food selectivity - cedwvu.org. West Virginia University Center for Excellence in Disabilities. (n.d.). Retrieved July 24, 2022, from https://www.cedwvu.org/media/1148/feeding-behavioral-food-selectivity-2014.pdf

Inoue, T., Ryoko, O., Ryoichi, S., Akari, A., Togashi, K., & Akio, W. (2016). 3.29 Investigating autism spectrum traits in adolescents with Anorexia Nervosa and Avoidant/Restrictive Food Intake Disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, *55*, S151. https://doi-org.suproxy.idm.oclc.org/10.1016/j.jaac.2016.09.161

King, H., Howarth, R., Choi, S. R., & Fischer, A. J. (2022). Using a teleconsultation-enhanced treatment for Avoidant/Restrictive Food Intake Disorder in an adolescent male. *Child & Family Behavior Therapy*, *44*(1), 35–59. https://doi-org.suproxy.idm.oclc.org/10.1080/07317107.2021.2024716

Koomar, T., Thomas, T. R., Pottschmidt, N. R., Lutter, M., & Michaelson, J. J. (2021). Estimating the prevalence and genetic risk mechanisms of ARFID in a large autism cohort. *Frontiers in Psychiatry*, *12*, 668297. https://doi.org/10.3389/fpsyt.2021.668297

Lucarelli, J., Pappas, D., Welchons, L., & Augustyn, M. (2017). Autism Spectrum Disorder and Avoidant/restrictive Food Intake Disorder. *Journal of Developmental and Behavioral Pediatrics*, *38*(1), 79–80. https://doi-org.suproxy.idm.oclc.org/10.1097/DBP.0000000000000362

Mayo Foundation for Medical Education and Research. (2018, February 22). *Eating disorders*. Mayo Clinic. Retrieved October 29, 2022, from https://www.mayoclinic.org/diseases-conditions/eating-disorders/symptoms-causes/syc-20353603

SPARK: A US Cohort of 50,000 families to accelerate autism research. (2018, February 7). *Neuron*, *97*(3), 488–493. https://doi.org/10.1016/j.neuron.2018.01.015

Taylor, T. (2020). Increasing food texture and teaching chewing for a clinical case within the home setting in Australia. *Learning and Motivation*, *71*, 101651. https://doi.org/10.1016/j.lmot.2020.101651

The most effective quantitative data collection methods. GCU. (n.d.). Retrieved November 17, 2022, from https://www.gcu.edu/blog/doctoral-journey/most-effective-quantitative-data-collection-methods

Zimmerman, J., & Fisher, M. (2017). Avoidant/Restrictive Food Intake disorder (ARFID). *Current Problems in Pediatric and Adolescent Health Care*, *47*(4), 95–103. https://doi.org/10.1016/j.cppeds.2017.02.005

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