School Challenges and Services Related to Executive Functioning for Fully Included Middle Schoolers with Autism

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Abstract

The educational services available for fully included middle schoolers with autism spectrum disorder (ASD) in the general education setting are not well known. Even less is known about how the executive functioning (EF) deficits of such youth are addressed in the classroom. The current study sought to identify the challenges, including EF, that middle schoolers with ASD face and the services that they receive on their Individualized Education Plan (IEP), and also explore specific strategies used to build EF skills at school. A convenience data sample was obtained from focus groups with educational personnel (n=15) and qualitative analyses of IEPs were conducted in middle schoolers with ASD with EF deficits (n=23). Results confirmed that social-communication and EF challenges are common. Multiple services and accommodations were identified, although EF challenges were rarely targeted on IEPs. Factors that may facilitate the success of EF strategies in the classroom are discussed.

Keywords*:* IEP, special education, autism spectrum disorder, middle school

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Youth with autism spectrum disorders (ASD) are at heightened risk for negative academic outcomes, including poor student-teacher relationships (Blacher et al., 2014), placement in more restrictive school environments (Etscheidt, 2006), and eventual problems transitioning and adapting successfully to high school and post-secondary education (Bolourian et al., 2019; Fleury et al., 2014). Students with ASD are particularly vulnerable to challenges during the middle school years (Hume et al., 2009). The transition to middle school marks a shift towards increasingly complex academic tasks including advanced coursework, rotating class schedules, managing homework and long-term assignments, developing and maintaining relationships with multiple teachers, and possibly navigating new buildings (Mullins & Irvin, 2000). More is known about support services for high school students (Fleury et al., 2014) and elementary school students (Estes et al., 2011) than that of middle school students with ASD without intellectual disability (ID). As middle school is a crucial transition period (Evans et al., 2018), and support services decline from elementary to middle school (Wei et al., 2014), it is imperative to better understand the challenges that middle school students with ASD without ID may be facing and what strategies and resources may be beneficial in the school context.

Youth with ASD have impaired executive functioning (EF), with particular challenges in organization, planning, prioritizing, memory, and materials management (DePaoli et al., 2015; Pennington & Ozonoff, 1996; Schall et al., 2012; Tamm et al., 2019; Troyb et al., 2014). These EF deficits are known to contribute to negative outcomes in youth with ASD (Estes et al., 2011; Fleury et al., 2014) and play a crucial role in the development of academic achievement (Engel de Abreu et al., 2014; Espy et al., 2004; Sjöwall et al., 2017). Indeed, 35-70% of youth with ASD

without ID present with deficits in organization (Kenworthy et al., 2005; Pennington & Ozonoff, 1996), time management, initiation (Pennington & Ozonoff, 1996), multi-tasking (Hill & Bird, 2006), and planning and prioritizing (van den Bergh et al., 2014). As a result, youth with ASD may struggle to acquire and manage critical academic behaviors (e.g., organizing materials, prioritizing assignments, studying effectively, and breaking down large assignments). Poor EF has also been associated with difficulties learning (Akshoomoff, 2005; Blair & Razza, 2007), poor social adaptation (Kenworthy et al., 2009; Klin et al., 2007), and decreased independence (Hume et al., 2009). Stronger EF skills predict better adjustment in the transition from elementary to middle school (Jacobson et al., 2011), and parents and youth with ASD identify EF deficits as impediments to academic success (Tamm et al., 2019). Finally, strong EF skills are critical for students with ASD who pursue higher education (Adreon & Durocher, 2007).

Given the frequent EF difficulties observed in students with ASD without ID, it is not surprising that their academic achievement is on average 2 to 3 years behind their typically developing peers (Wagner et al., 2003). In fact, one study found that elementary school-aged students with ASD performed one standard deviation below their same-aged peers on all measures of academic achievement (Wei et al., 2015). Interventions, such as teaching strategies that address EF processes, have therefore been recommended (Steinbrenner et al., 2020). However, there is a dearth of interventions targeting EF skills for youth with ASD (Soorya & Halpern, 2009). One intervention, Unstuck and On Target (Cannon et al., 2011), was explicitly designed for elementary school-aged children with ASD to improve goal-directed behavior and flexible thinking; however, it is unclear how and if these strategies generalize to middle school. Thus, schools are most likely piecing together evidence-based strategies such as prompting, task analysis, visual supports, social skills training, and technology (e.g., use of specific apps and

computer programs) (Odom et al., 2021; Steinbrenner et al., 2020) to target EF deficits in students with ASD without ID. Such strategies or accommodations are likely included in a student's Individualized Education Program (IEP).

An IEP outlines the student's special education program for the year and includes goals and services necessary to aid the student in meeting those goals. Services on an IEP may include accommodations, interventions, and modifications. For example, speech-language therapy, assistive technology, preferential seating, modified presentation of subject matter, and modifications to testing (e.g., extended time) may be recommended (Ozonoff & Schetter, 2007). Services may also include specific supports that address areas of concern (e.g., social stories to increase conversation skills, visual schedules to increase understanding of class schedule).

There is limited literature exploring the IEP goals and services for middle schoolers with ASD, particularly those fully included in the general education setting. A survey of IEP goals for these students identified that goals were mostly related to communication, self-help, social, motor/sensory, academic and behavior domains (Kurth & Mastergeorge, 2009). Surprisingly, a category related to EF did not emerge and the only EF deficits generally identified were attention difficulties (Kurth & Mastergeorge, 2009). Other common EF deficits for youth with ASD, such as organization and time management, have not been typically identified as IEP goals (Spears et al., 2001; Wei et al., 2014; Wilczynski et al., 2007). However, the Kurth and Mastergeorge (2009) study was conducted more than a decade ago. More recent IEPs for youth with ASD may include services specifically related to EF. Certainly, "organization" is now often coded as an IEP goal for students with ADHD (Spiel et al., 2014), suggesting IEPs may have evolved to include specific EFs. Further, specific IEP services that target EF deficits have been proposed to help offset academic challenges (e.g., task analysis to target planning deficits; Fleury et al.,

2014). Investigation of the scope of EF services for students with ASD is warranted, especially as they transition to middle school and services decline (Wei et al., 2014).

For the past few years, our group has been developing EF interventions targeting organization, planning, study skills, etc., for middle school youth with ASD without ID in the outpatient and school settings (MASKED). During the intervention development and refinement phases, focus groups with school personnel who work with students with ASD without ID in the general education classroom were conducted to enhance our understanding of their profile of EF deficits and related academic challenges and how school personnel address these deficits. Additionally, the IEPs of youth with ASD were obtained in the context of treatment development activities, providing an ideal context for exploring whether IEPs include goals and/or services targeting their EF deficits. The purpose of this study is to use this data to (1) explore the most prominent EF difficulties and other academic challenges exhibited in middle school; (2) understand how EF is addressed in IEPs and the facilitators, barriers, and classroom strategies used to target EF skills; and (3) better understand the landscape of IEP services in the general education middle school setting for youth with ASD without ID.

Method

This study is part of a large project focused on focused on developing and evaluating interventions targeting academic EFs in the school and outpatient settings. Data were obtained from 1) focus groups with teachers who work with youth with ASD (i.e., as part of the development and refinement of the interventions), and 2) IEPs of youth with ASD who participated in intervention development activities (i.e., open trials). Multiple methods including qualitative focus groups and document analysis were utilized. The studies were approved by the MASKED Institutional Review Board (IRB) and all participants consented or assented to

participate. The project is being conducted in the greater Cincinnati area, which includes counties in the states of Ohio, Kentucky, and Indiana around the city of Cincinnati.

Participants

Teachers were recruited from schools in the greater Cincinnati area via email and letters soliciting those with experience working with middle school youth with ASD to provide feedback as focus group participants on the need for an intervention for students with ASD struggling with organization and attention. Educational personnel (73% female; 87% White) who participated in the focus groups included general education (n = 9) and special education teachers (n = 6) currently teaching in a middle school classroom (M=11.3, SD= 7.9 years middle school teaching experience) in 14 different schools. All teachers had a bachelor's degree and 86.7% had a master's degree. Most reported having worked with a number of youth with ASD over the years (average number of students with ASD taught: M=16.2, SD= 20.6). Notably, the special education teachers also reported working with students in the general education classroom.

Educational records were obtained for 23 boys[1] (73.9% White) attending 6th (30.4%), 7th (34.8%), or 8th (34.8%) grade in 16 different middle schools. Note that the two datasets do not overlap (i.e., teachers in the focus groups were not the teachers of students whose IEPs were reviewed). All youth had a diagnosis of ASD confirmed using the Autism Diagnostic Observation Schedule, 2nd Edition, Module 3 (Lord et al., 2012) or a review of medical and educational records. An IQ ≥ 80 (M=99.1, SD=18.2) was confirmed using the Kaufman Brief Intelligence Test, Second Edition (Kaufman & Kaufman, 2004). All youth had significant parent-rated EF deficits (i.e., T-score >65) on the Plan/Organize (M=68.40, SD=7.79), Task-Monitor (M=66.63, SD=6.91), and/or Organization of Materials (M=64.63, SD=10.02) subscales

[1] It should be noted that no effort was made to exclude girls, but this is the sample from whom data were available.

of the Behavior Rating Inventory of Executive Function, Second Edition (Gioia et al., 2015). All youth attended general education classes for the majority of the day.

Procedures

Focus Groups

Teachers (n = 15) attended one of two 2-hour focus groups. Focus groups were conducted by trained moderators (licensed clinical psychologists and psychology post-doctoral fellows). The discussion guide included three key questions: 1) What are the academic and EF challenges that middle school students with ASD experience?; 2) What strategies have been helpful/not helpful in teaching youth with ASD?; 3) What is in place at your school to address EF challenges for students with ASD? During focus groups, all terms were defined (e.g., EF was defined as organization, task initiation, planning, flexibility, prioritizing, and emotional control). All focus groups were video and audio-taped. Participants were compensated USD $125.

Focus group content was transcribed verbatim by an independent transcription service. We used a directed approach to content analysis focused on repeated patterns of meaning across the data (Hsieh & Shannon, 2005). Three coders independently reviewed the data from the first focus group to determine the overall framework and coded the key concepts aligned with the focus group questions. They then discussed preliminary findings, and through consensus, an initial set of codes was identified. The remainder of the transcripts were then independently coded using the emerging data patterns derived from the first focus group (e.g., responses to Questions 2 and 3 were combined due to significant content overlap). Any text that did not fit the initial coding scheme was given a new code. Categories were formed from the codes and synthesized into major themes, minor themes, or off-topic/not relevant. Differences between coders were resolved through discussion of underlying meaning and revisiting the data until

consensus was achieved. Coders reached saturation because no new codes emerged. An independent coder coded all transcripts to minimize potential bias and optimize accurate representation of perspectives; this coder was >90% consistent with the other coders.

Document Analysis: IEPs

Parents signed a release of information to allow the research team to obtain IEPs for the academic school year the participant was in the study. Each IEP was coded simultaneously by two clinical psychologists, a psychology post-doctoral fellow or psychology practicum student, and a research coordinator. The group read each relevant document and coded it for areas of concern/goals and services using an adapted coding scheme developed at Ohio University (Spiel et al., 2014; see Supplemental Materials). Areas of concern included adaptive behaviors, sensory issues, social communication, EF, ADHD symptoms, academic skills, etc. Services included behavior modification and reinforcement, materials and time organization support, extended time, chunking, breaks, etc. Each item was coded as "yes" or "no" and the number of items coded "yes" was summed to derive the number of occurrences for areas of concern and services.

Results

Focus Groups

EF Challenges

All teachers identified a range of EF difficulties that affected students' ability in the classroom and at home. Organization of materials was one of the most prominent challenges identified (e.g., students managing handouts, folders, notebooks, study guides, etc. from multiple classes with multiple teachers). Students with ASD particularly struggled with writing down assignments in a planner and with prioritizing tasks based on due date, length of assignment, motivation, etc. Some teachers noted that while their school utilized a specific planner or online

portal for managing assignments, they did not have the necessary time and effort to devote to ensure consistent use of these tools.

Maintaining attention and focus during class and when completing assignments was another theme. Relatedly, task initiation, perseverance, and task completion were identified as areas of difficulty. In particular, students had trouble beginning tasks independently and persevering if the assignment was perceived as difficult, uninteresting, or not motivating. Students using computers struggled with staying focused on assignments (e.g., played an online game, accessed unrelated websites). Lack of flexibility was another theme and many students with ASD also struggled to adjust to day-to-day changes (e.g., modified schedule, fire drill, classroom procedures). Emotional dysregulation was also identified and often appeared to overlap with flexibility (e.g., "acting out" following minor schedule changes).

Other Academic Challenges

Teachers identified a range of other academic challenges (see Table 1). Several of the themes corresponded to challenges related to the transition from elementary to middle school (e.g., adjusting to lessons with fewer activities). Another challenge was understanding and following expectations, which included adapting to the expectations of different teachers and following specific class procedures (e.g., how and when to turn in homework). One teacher noted: "we all use different technology, even from class to class...We all have different ways of doing things, different assignments…And that's a lot for them to process." Teachers noted that students may not realize that they may get lower grades than they did in elementary school due to more rigorous academic expectations. Additionally, students struggled to adjust to being more independent and less reliant on teachers or parents. In describing one student, a teacher stated: "we've built this safety net for him behaviorally, that I think it's really hurt him academically…so

now we're [parents, teachers] trying to pull back our reins to make him more independent." Many teachers emphasized the importance of building independence over time.

Another theme discussed was students understanding the importance of why both classwork and homework need to be done to learn and master content. Reportedly, many students thought they knew the material already and/or could just memorize everything prior to a test. Teachers also noted that middle school students with ASD struggled with various aspects of social-communication including asking for help, requesting a break, and advocating for themselves. Relatedly, students struggled with elements of group projects including engaging and collaborating with other students, working with a range of students, and knowing when to be a leader versus a collaborator when working on a project. Students also struggled with managing emotions tied to perfectionism, failing, sensory issues, and rules. Finally, challenges with critical thinking when writing an essay or applying facts/information when taking a test were endorsed.

Classroom Strategies to Address Academic and EF Challenges

Teachers identified and described a range of services to assist students in areas such as building EF skills, understanding classroom and teacher expectations, meeting goals, learning and studying, and building social-communication skills (see Table 2). The most common were behavioral strategies, which all teachers found useful with individual students or with an entire classroom. Many personnel had received specific training on behavioral strategies that were beneficial to classroom management (e.g., positive behavioral intervention and support).

Another theme identified was the use of visual supports including a written daily classroom schedule, color-coded folders or papers for organizing materials, and colored post-it notes to communicate understanding of material (e.g., student puts a red post-it on her desk if she

does not understand a concept). Many teachers reported that it was critical to communicate any changes in the daily classroom schedule to students with ASD to minimize frustration or anxiety.

Another theme included services that addressed learning, mastering, and studying classroom content. A majority of teachers reported utilizing a study guide, and several expressed the importance of including questions that build abstract or critical thinking skills in order to apply information on a test or quiz. Many schools utilized a daily or weekly classroom period to directly teach EF skills (e.g., writing in a planner, prioritizing assignments) or study skills.

Although not all teachers utilized laptops and tablets in the classroom, all classrooms incorporated websites, apps, and online platforms as teaching strategies, to supplement teaching, or increase mastery of concepts. Additionally, many schools utilized an online platform for posting and turning in assignments. Several teachers encouraged students with ASD to email with questions if they were uncomfortable asking a question in front of the entire class.

Lastly, teachers described services that addressed the social-communication challenges of students with ASD, especially when working with partners or in small groups on classroom projects. Common strategies included doing partner work before moving to small group work, pairing students with ASD with understanding and compassionate classmates, and rotating all students in a classroom to build everyone's ability to flexibly work with other students. Several teachers described the importance of understanding the profile of social strengths and difficulties of students with ASD to best support them (e.g., by reading their IEP).

Factors that Impact Implementation of Strategies Addressing Academic and EF Challenges

Several factors emerged during the discussion of strategies that appeared to facilitate or impede their implementation and effectiveness (see Table 3). Specifically, teachers noted the importance of consistent and collaborative communication between special education teachers,

general education teachers, intervention specialists, and school administrators about services that may benefit students, while also identifying the staff member that is responsible for implementation. One special education teacher noted that one of her biggest struggles was finding ways to communicate and build buy-in of general education teachers about specific strategies that work for students with ASD. Teachers also emphasized the importance of a strong parent/teacher relationship that includes consistent communication to allow for teachers to demonstrate that they know and understand a student, which then makes it easier to tackle issues such as building independence. Lastly, while technology was frequently utilized to augment teaching, many expressed how critical it was to set up specific rules around use of technology and monitor its use. Many teachers reported benefits of posting assignments and agendas at the same times each day/week so that students knew what to expect and when to expect it.

Educational Records

Areas of Concern/IEP Goals

The most frequent areas of IEP concern/goals listed were ADHD symptoms and social-communication (Table 4). With regards to EF and attention, the highest frequency items were assignment completion, organization and planning, on task behavior, general EF and problem-solving skills, memory, and processing speed. In terms of academic problems, 56.5% of students were rated as having difficulties in written language, written expression, and/or writing.

Services

The most frequent IEP services reported were modified presentation of material, modified pacing, modified environment, and behavior reinforcement (see Table 5). Additional services, not listed in Table 5, included speech and language therapy (39.1%), occupational therapy (17.4%), and peer support (4.3%). Approximately 47.8% of children had an intervention

specialist listed as a support. Notably, only two IEPs included a service directly referencing EF (i.e., direct instruction in organization and direct instruction in EF skills).

Discussion

The goals of the present study were to enhance our understanding of the profile of EF deficits and related academic challenges in middle school youth with ASD without ID, and how schools and teachers address these deficits. Not surprisingly, and consistent with the literature (Ozonoff & Schetter, 2007; Pennington & Ozonoff, 1996), results indicated that middle school youth with ASD demonstrate significant EF deficits, particularly in relation to organization, planning and prioritizing, task initiation, persevering, maintaining focus, and flexibility, which may then negatively impact their ability to be successful in the general education environment. A wide range of services and supports were reported to be employed in the classroom context to address EF challenges, including behavioral strategies, visual supports, strategies targeting learning, mastering, and studying classroom content, technology, and social competence strategies (see Table 2). The services on the IEPs of middle school youth with ASD with EF deficits were generally consistent with the classroom strategies discussed by teachers in the focus groups. With regards to other non-EF focused services listed on IEPs, the most common were accommodations such as small group testing, extended time, and preferential seating. Other common services included visual supports, modeling, and paraphrasing to increase learning. The results, if replicated in a larger, more diverse sample, highlight the need for consistent use of evidence-based strategies that address EF challenges in the classroom.

The EF difficulties that school personnel reported not only affect the majority of students with ASD in our study, but appear to significantly overlap with challenges in the areas of inattention, hyperactivity, and impulsivity experienced by youth with ADHD. This makes sense given that approximately 74% of the IEPs indicated that the student had symptoms of ADHD

and that common areas of concern included assignment and work completion (52.2%), organization/planning (47.8%), on-task behavior (43.5%), and EF (34.8%). However, the services on the IEP do not reflect what would be expected given that many students with ASD have significant EF challenges and ADHD symptoms (Antshel & Russo, 2019). Only 40.7% of students had assistance with organizing their materials and only 22% had a formal study skills class. Thus, there appear to be few services targeting their significant difficulties in areas such as planning, prioritizing, and initiating, persevering, and completing tasks, which makes it more likely that their EF challenges will continue to prevent them from achieving academic success as curricula become increasingly difficult and more independence is expected.

Relatedly, the teachers described other academic challenges that may interact with EF difficulties such as understanding and following classroom expectations, communicating with peers and teachers, and managing emotions. These challenges appear to be specific to the ASD population which underscores the importance of taking their unique profile of both ASD symptoms and EF challenges into account when determining how to support their academic achievement as they transition to a more demanding middle school environment. Teachers in the focus groups stated that a majority of middle school students were more dependent on both parents and teachers than they should be, and students with ASD even more so. Recent research has shown that parental expectations and involvement (e.g., helping to complete homework) is linked to decreased academic achievement (Wong et al., 2018). This suggests that it would be beneficial to systematically target the development of increased independence in applying EF skills during the transition from elementary to middle school rather than compensating for a lack of those skills with curricular adaptations and more support services (Kurth & Mastergeorge, 2009). Teachers reported that elementary school teachers may not be aware of the expectations

and demands of the middle school classroom, and that parents may not realize how big of a jump occurs from elementary to middle school in terms of assignments, managing materials, following classroom rules, etc. These findings are consistent with known issues related to the transition to middle school (Evans et al., 2018), yet seem even more challenging for youth with ASD. One teacher described a "summer bridge" program that oriented students and parents to some of the changes that would occur upon entering middle school. Such an approach that includes elementary and middle school teachers, parents, and students while explicitly addressing the increased demands of middle school may not only support students with ASD, but all students.

During focus groups, several factors emerged as facilitating or impeding the effectiveness of strategies that may support learning or address EF challenges. Specifically, teachers noted the importance of consistent, collaborative communication between school personnel, the need for responsive and knowledgeable school staff, and the need for a strong parent/teacher relationship; these factors are key to teamwork and problem solving to help students learn and meet goals (Azad et al., 2016). Although these findings are seemingly obvious, previous work suggests that although parents identify teachers as being critical to their child's academic success, many do not feel they have sufficient communication with school personnel (Tamm et al., 2019; Tucker & Schwartz, 2013). Thus, improved communication may need to be directly addressed.

It is critical to break down the barriers that affect the ability of general education and special education teachers to successfully ensure implementation of evidence-based strategies that lead to increased academic success for middle school students with ASD. Despite the dearth of interventions that target EF in middle school, the focus group participants identified a range of evidence-based strategies (e.g., increasing structure and predictability, incorporation of visual supports, reinforcement, directive teaching, technology; Wong et al., 2015) and services that

target EF, as well as factors that may increase the likelihood of successful implementation of these supports. A possible solution for addressing EF deficits in middle school may be to incorporate school-wide interventions and strategies to directly impact all students that are also integrated with current classroom or extracurricular activities (Carter et al., 2014; Carter et al., 2013). This idea is supported by the fact that teachers frequently stated that the challenges that students with ASD face are likely experienced by other middle school students (e.g., students with diagnosis of ADHD). In fact, many teachers noted that the strategies that they use for students with ASD would likely be beneficial for their entire classroom, but they lack the time or resources to implement the strategies for all students. These findings suggest it may be both feasible and effective to implement some classroom-wide supports (e.g., binder organization system, study guide including critical thinking questions), while also providing specific classroom or individualized supports to students with IEPs if needed (Batsche, 2014; Odom et al., 2013). If supports were implemented classroom- or school-wide, this would also allow for more streamlined and effective communication between teachers and with parents. Our findings also suggest that interventions need to ideally account for issues related to adolescent independence and communication between school personnel.

The current study provides evidence of the need for EF interventions for fully included students with ASD. First, while middle school teachers are clearly aware that students with ASD have EF challenges that affect their academic success, these EF deficits may not be identified as an area of concern on their IEP. Further, as rates of inclusion for middle school students with ASD increase, teachers do not typically have the training to implement evidence-based strategies to meet their needs (Kurth & Mastergeorge, 2009). Both parents and teachers are aware that IEP services are not thoroughly addressing EF challenges through implementation of evidence-based

strategies (Wei et al., 2014). In fact, most IEPs for fully included students with ASD focus more on academic progress as a result of support services rather than how to adapt environments and utilize strategies that facilitate independent academic success (Kurth & Mastergeorge, 2009).

Limitations

The current study is not without limitations. First, the sample size is small. Further, the sample for the IEP records consisted of all White male students, which may not be fully generalizable to females and individuals of other races/ethnicities. Relatedly, all participants were identified with EF deficits. Also, the focus group participants were primarily White females, which while consistent with the demographics of the Greater Cincinnati area (i.e., 70% White; U.S. Census Bureau, 2019) and higher percentage of female teachers in the US (i.e., 76% female; Institute of Education Sciences, 2021), may limit generalizability. Additionally, it would have been ideal to interview school personnel directly to supplement information derived from IEPs; while a service may be recommended on an IEP, it may not always be implemented and/or how it is implemented may vary. Relatedly, the two data sets were unique which precluded our ability to cross check responses provided by teachers in the focus groups with IEPs of students.

Conclusions

Most middle school youth with ASD present with a complex set of challenges that not only include social-communication impairments and rigid behaviors related to ASD, but also EF deficits that may be exacerbated by co-occurring symptoms of ADHD. Their clinical presentation is then further complicated by being overly dependent on teachers and parents as they transition to middle school. Such challenges may make it difficult to prioritize treatment targets, but our data suggest that EF deficits affect academic success, and that IEPs rarely address EF deficits in the general education setting. Replication is warranted.

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Table 1

Other Academic Challenges Reported by Teachers

Academic Challenge	Examples
Adapting to Middle School	• Transitioning to different classes with different teachers • Adjusting to classes that are more didactic and have fewer activities
Understanding Expectations	• Understanding the expectations of different teachers • Following the procedures of the classroom • Managing various technology platforms and apps across classes • Understanding how increased academic expectations may affect grades
Independence	• Adjusting to being more independent in terms of what needs to be done and when it needs to be done • Relying less on parents and teachers to provide assistance • Adjusting from increased supports in elementary school to fewer supports and increased autonomy in middle school • Building independence over time with support from parents and teachers
Understanding the Purpose/Need to do Work	• Prioritizing schoolwork above other interests • Accepting that work is important and critical to learning • Understanding that classwork and homework needs to be done
Social-Communication	• Asking for help if an assignment is unclear or concept not understood • Requesting a break when overwhelmed or frustrated • Accepting and applying constructive criticism from a teacher
Group Projects	• Working collaboratively and actively engaging with other students • Starting and persevering on group assignments • Understanding when to be a leader vs. a follower
Critical Thinking	• Writing that demonstrates connecting concepts rather than restating facts • Applying knowledge and definitions from a study guide to a test

Table 2

Classroom Strategies Identified During Focus Groups to Address EF and Academic Challenges

Strategy	Examples
Behavioral	• Utilize a behavior contract for individual students working on specific goals • Utilize a classroom-wide behavior management system • Reward appropriate behavior (e.g., turn in homework) • Give a directive followed by a positive consequence • Provide choices to increase motivation (e.g., choose which 10 of 20 math problems to complete) • Give both preferred and non-preferred choices • Utilize student's strengths or interests to increase motivation to learn • Provide verbal praise to students demonstrating appropriate behavior
Visual Supports	• Visual schedule or written schedule • Post-its (e.g., communicate understanding of material to teacher) • Color-coded materials (e.g., green folder for Math; study guides always on blue paper)
Studying	• Use of a study guide to outline what needs to be learned and mastered for a test or quiz • Include both basic definitions and critical thinking questions on study guides • Create a notebook for each subject • Utilize a specific classroom period (e.g., study skills class) to build academic EF skills
Technology	• Various websites (e.g., current events) & online quizzes (e.g., Quizlet) • Songs to teach concepts (e.g., Mr. Parr YouTube song to learn the phases of the moon) • Online graphing calculator • Online platforms for managing assignments and classwork • Use phone to take a picture of weekly assignments • Use email to ask questions or clarify concepts
Social Competence	• Do partner work before moving to small groups for projects • Pair with specific classmates to increase success with group projects • Rotate all students in a classroom for group projects • Develop understanding of student's specific social-communication difficulties • Build skills using scripts, cue cards, sentence starters, and talking chips

Table 3

Factors that Facilitate or Impede Implementation of Strategies to Promote EF

Factor	Examples
Consistent/Collaborative Communication Between School Staff	• Developing a roadmap of what works/does not work for student based on their IEP or 504 Plan • Understanding and communicating about the strategies and supports that are working/not working in various classes • Discussing successful modifications and accommodations • Delegating who is responsible for modifications
Responsive and Knowledgeable School Staff	• Developing consistent set of rules and expectations for student • Communicating effectively (e.g., give student feedback on behavior) • Building and maintaining relationship (e.g., student can admit mistakes, how student can ask for help) • Fostering a sense of independence in the classroom • Flexibly adapting to student/classroom needs (e.g., offering mastery learning, providing choices)
Parent/Teacher Relationship	• Consistently communicating with parents (e.g., weekly email) • Ensuring that communication is coming from both general education and special education staff • Working as a team to collaboratively address issues such as prioritizing schoolwork and setting realistic goals • Discussing how elementary school may be different from middle school (e.g., increased responsibility, academic rigor) • Addressing expectations around independence for student (e.g., grades, completion of homework) • Demonstrating that teacher knows the student (e.g., what they like, what successes they have had)
Technology Considerations	• Setting up specific rules around use of technology (e.g., when personal cell phone can be used, when games can be played) • Locking laptops after a certain period of time (e.g., can access Google for 10 minutes, can only access certain websites) • Monitoring students who are playing games or listening to music during class • Consistently posting assignments and agenda on online platform so that students know what to expect and when to expect it

Table 4

Areas of Concern Listed on Individualized Education Plan

Area of Concern	***n***	***%***
ASD Diagnosis Related		
Social-communication (pragmatic language)	15	65.2%
Social skills with peers	8	34.8%
Expressive/Receptive language	3	13.0%
Adaptive behaviors	3	13.0%
Sensory issues (restrictive, repetitive behaviors)	3	13.0%
Small group work	1	4.3%
Comorbid Symptomatology		
ADHD inattention and hyperactivity/impulsivity symptoms	17	73.9%
Emotional dysregulation	9	39.1%
Anxiety (general/social/school/test)	7	30.4%
Compliance/defiance/disrespectful	4	17.4%
Fine motor skills	3	13.0%
Speech/articulation/fluency	2	8.7%
Aggression	2	8.7%
Depression	1	4.3%
Executive Functioning Deficits		
Assignment/work completion	12	52.2%
Organization/planning	11	47.8%
On-task behavior	10	43.5%
Executive functioning (including problem solving skills)	8	34.8%
Memory	2	8.7%
Processing Speed	1	4.3%
Academics/Learning		
Written language/written expression/writing	13	56.5%
Mathematics	8	34.8%
Reading comprehension	4	17.4%
Study skills including note taking	3	13.0%
Reading fluency/decoding	2	8.7%
Spelling	0	0%

Note. Listed in order of frequency of endorsements within each subdomain.

Table 5

Services Listed on Educational Records

Service/Accommodation/Modification	*n*	*%*
Presentation of Material		
Modeling	17	73.9%
Small group instruction/testing	16	69.6%
Visual supports (checklists, cues, graphic organizers)	13	56.5%
Paraphrasing	13	56.5%
One-on-one instruction/testing	9	39.1%
Manipulatives	1	4.3%
Assignments/Testing		
Repetitive practice	10	43.5%
Breaking up tasks (chunking of assignments)	7	30.4%
Modified assignments/reduction	8	34.8%
Formal academic skills program	5	21.7%
Redo assignments	4	17.4%
Reader	4	17.4%
Adapted grading scale	0	0%
Test aids	0	0%
Environment		
Resource room	18	78.3%
Preferential seating	13	56.5%
Quiet room	5	21.7%
Pacing		
Extended time	20	87.0%
Breaks	18	78.3%
Reinforcement		
Behavior modification (ignoring, rewards, reinforcement)	20	87.0%
Attention checks	14	60.9%
Materials and Equipment/Assistive Technology		
Assistive technology/calculator/typewriter	11	47.8%
Material organization support	10	43.5%
Scribe/Xerox notes	10	43.5%
Study support (tutoring, study guide, study skills class)	5	21.7%
ASD Related Supports & Strategies		
Social skills training	10	43.5%
Social-communication (stories/narratives, comics, role play)	9	39.1%
Emotional support	9	39.1%
Sensory modifications or accommodations	8	34.8%
Time/Transition management (i.e., notice of schedule changes)	6	26.1%
Behavior support (blocking, physical management)	1	4.3%