Practical Teaching Strategies for Students with Autism Spectrum Disorder: A Review of the Literature

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Abstract

The number of children with Autism Spectrum Disorder (ASD) is rapidly increasing, and there is a struggle within our educational system to meet the needs of these students. While there is a growing awareness among general classroom teachers about strategies that can be implemented to ensure positive gains for students with ASD, there is still a need for continuous professional development in the area. This literature review addresses the various challenges that students with autism face in educational environments due to their disorder. It also suggests practical social, behavioural, and academic strategies that teachers can implement within their classrooms to improve the performance and educational experiences of students with ASD.

The number of students with autism spectrum disorder (ASD) who are included and participating in mainstream classrooms has increased over the past few years (Fleury et al., 2014). This presents teachers with additional responsibilities to meet the social, behavioural, and academic needs of these students. Unfortunately, supports are not always in place to ensure that the needs of autistic students are being met appropriately. Many general education teachers are not informed about "(a) how characteristics associated with ASD can impact student performance, (b) academic profiles of individuals with ASD across content areas, and (c) interventions found to be successful in improving academic outcomes across individuals with ASD" (Fleury et al., 2014, p. 69). As a result of this lack of teacher awareness and education, students with autism may spend most of their time at school disengaged from learning activities (Muchetti, 2013). On the other hand, according to Manti, Scholte, and Van Berckelaer-Onnes (2013),

> A vast majority of children with ASD who are provided with appropriate education show improvements not only in academic learning and functional language but also in socialization, adaptive skills and communication, while many of them can take better advantage of their abilities and skills, in this respect that they can use them in a more productive and generalised way. (p. 64)

Additional research, specifically to determine what methods might be best for each individual with ASD, is necessary to ensure that teachers have knowledge of the initiatives needed to make a positive difference in their students' lives (Muchetti, 2013).

The purpose of this literature review is to address social, behavioural, and academic teaching strategies that can be implemented to improve the educational experiences of students with ASD. The strategies that are discussed are practical and easily applicable to both general education and special education learning environments. Each strategy can be used for students with ASD, regardless of age, but modified appropriately for their individual needs throughout their school years. These strategies address common issues related to the social, behavioural, and academic challenges that most students with ASD experience.

While dividing the strategies into the three areas of social, behavioural, and academic interventions, there is still some overlap among the categories because the three domains are interrelated and directly affect each other. For example, improved social skills lead to a decrease in repetitive behaviours (Boyd, Woodard, & Bodfish, 2011). The decrease of repetitive behaviours can lead to increased engagement in learning activities, which directly affects knowledge acquisition (Muchetti, 2013). There is also a noted relationship between the impacts of enhanced social abilities and academic learning; therefore, improving students' social skills

will in turn improve their academic performance (Fleury et al., 2014). The social abilities of students with ASD also directly affect how they interact with their peers and what types of relationships are formed (Ostmeyer & Scarpa, 2012). Improved peer relationships potentially affect the students' emotional well-being and confidence, which also contribute to improved engagement, and again improved academic performance.

How Autism Spectrum Disorder Affects Student Performance

ASD is a neurodevelopmental disorder that typically affects a person's ability to communicate and interact socially with others (Centers for Disease Control and Preventions, 2015). Most people with ASD also exhibit challenging or repetitive behaviours. Autism can, but does not always, affect an individual's cognitive ability. Because autism is a spectrum disorder, it affects each person differently and presents with varying degrees of severity. According to the Centers for Disease Control and Prevention (2015), one in every 68 children has ASD ("Who Is Affected," para. 1). The disorder affects people from various racial, ethnic, and socio-economic backgrounds, and it occurs in males five times more often than in females. The exact cause of autism is unknown; however, certain factors increase the risk of autism, such as an existing family history of it and children born to parents of an older age (Centers for Disease Control and Preventions, 2015).

Children with ASD experience difficulties in their ability to communicate and effectively interact with others (Jacklin & Farr, 2005). Approximately 30-50% of children with ASD are minimally verbal upon entering school (Muchetti, 2013, p. 359). Most experience impairments in receptive and expressive communication (Fleury et al., 2014). The ongoing struggles for individuals with ASD in social contexts can be attributed to their inability to interpret social cues (Jacklin & Farr, 2005). Individuals with ASD often appear socially awkward, leading to rejection by their peers, while also sometimes becoming victims of teasing and bullying (Ostmeyer & Scarpa, 2012). These circumstances directly affect a child's emotional well-being. For high-functioning children with ASD, such experiences create an ongoing cycle of these children feeling increased anxiety and depression as a result of their social incompetence; in turn, their increased anxiety and depression contributes to their social incompetence.

Considering that schools are social environments, one can see a problematic issue for children who are socially impaired (Fleury et al., 2014). Poor academic performance is often noted for autistic children because their social abilities affect their capacity to learn within a classroom (Ostmeyer & Scarpa, 2012). Through a survey of teachers, researchers Elliot and Gresham compiled a list of 10 social skills deemed necessary for successful learning to occur within a classroom environment: "listening to others, following steps, following rules, ignoring distractions, taking turns, asking for help, getting along with others, staying calm, taking responsibility for one's own behaviour, and doing nice things for others" (as cited in Ostmeyer & Scarpa, 2012, p. 932). Students with ASD often experience difficulty with all of these social skills. In addition, some aspects of the school experience may exacerbate the presented characteristics of ASD. For example, a classroom is typically crowded and noisy. In most schools, there are frequent transitions among various teachers and classrooms, most with a different mixture of peers and with different rules (Fleury et al., 2014). All of these challenges may prevent autistic students from engaging in learning.

Individuals with ASD often engage in repetitive behaviours or routines (Fleury et al., 2014). Their struggles to cease these behaviours also contribute to their social discomfort. The existence of these repetitive behaviours in autistic individuals is attributed to the impairment of their executive functioning system. Executive functioning regulates an individual's behaviour; its impairment compromises an autistic individual's ability to self-regulate behaviours.

Transitions are particularly difficult for autistic students, because they experience anxiety and discomfort in new or changing situations (Perfitt, 2013). These highly stressful situations, or

any situation that inhibits their repetitive behaviours or routines, affects their ability to manage their emotions and typically results in disruptive behaviours (Boyd et al., 2011).

Students with autism experience various other difficulties, as well, all of which affect their ability to learn as a typically developing child might learn. Autistic children experience deficits in imitational and observational learning (Field et al., 2010). Although they often have superior visual processing skills, they also often process auditory and linguistic information at a rate much slower than their peers (Fleury et al., 2014). The previously mentioned impairment to their executive functioning system prevents them from being able to process multi-step directions, maintain the organization of their materials, and sustain self-motivation. It is often extremely difficult for them to generalize information across settings and to see a situation from another person's perspective (Ostmeyer & Scarpa, 2012). Children with autism may fail to see "the picture . . . [but] can still see the individual puzzle pieces in the completed picture" (Frith, 1989, as cited in Jacklin & Farr, 2005, p. 202). Rather than view the puzzle as a picture comprised of the individual pieces, as a typical child would, many autistic children will continue to focus on the individual puzzle pieces and not see the picture that has been created by putting them together.

Literacy skills are also affected by autism, because many autistic children are unable to progress past sight word recognition (Muchetti, 2013). Depending upon cognitive abilities, autistic children may be able to decode text but have problems understanding what they have read, because their reading comprehension capabilities do not match their decoding abilities (Whalon & Hart, 2011). They also often have an inability to make inferences (Jacklin & Farr, 2005). As well, poor fine motor skills and poor visual-motor speed result in difficulties holding writing utensils, and even when they can hold a pencil their printing may be illegible (Fleury et al., 2014).

The combination of communicative, social, and behavioural impairments directly affects the chances of students with ASD excelling academically. Considering that schools are social environments, children with autism enter the educational system already at a disadvantage when compared to typically developing children. For this reason, supports need to be in place that will promote the success of students with autism both academically and socially. Numerous social, behavioural, and academic strategies can be implemented within both mainstream and special education classrooms, in order to assist students with ASD and contribute to creating positive experiences for them at school.

Social Strategies

Educators can initiate strategies within their classrooms to cultivate the social skills of autistic students. Because many children with autism have limited imitation skills and are unable to pick up on social cues, social interactions literally need to be taught to them (Jacklin & Farr, 2005). Social skills are most effective for students with autism when they are taught within the natural environment in which their demonstration is expected. This approach recognizes that many autistic students have an inability to generalize skills across various settings (Fleury et al., 2014). For that reason, students with ASD may also not transfer social skills learned outside school (e.g., playground, home) to a specific situation within school (Ostmeyer & Scarpa, 2012). Teaching social skills that are appropriate within school will be most effective when taught within a school environment. Peer models and tutors are often successful in helping to increase social skills in students with ASD. Even if a school-wide program is not available, classroom teachers can use a similar approach and initiate their own peer modelling program that is individualized for the children's needs. Engaging students in playful imitation games and using strategic classroom computer applications are practical strategies that can be implemented within schools to enhance the social skills of students with autism.

Children with ASD lack imitative skills, which affects their ability to learn skills by observing others (Fleury et al., 2014). Because observation is an effective method of social learning for typically developing children, this places autistic students at a large disadvantage. One strategy

that is effective in encouraging imitative behaviour from students with ASD is the teacher imitating the behaviour of the autistic child in a playful manner. Mimicking their behaviour encourages them to do the same and can result in them copying the teachers' behaviour for other desired actions, as well. Field et al. (2010) conducted a study that involved 20 nonverbal children with ASD to determine how an imitative adult would affect the children's imitative and social behaviour. The results confirmed that children with ASD do have impaired imitation skills, but when an adult is engaging in imitative behaviour with a child, the child can display social imitations. Considering that the children displayed higher percentages of imitative behaviour while they were being imitated themselves, parents and teachers should consider using game-like reciprocal turns of imitation to increase the children's ability to imitate. Imitation is a way for autistic children to learn new skills, therefore increasing their social and cognitive development.

Computers have emerged as an effective aid for individuals with autism in the communication, social, behavioural, and academic areas. As a social strategy, the use of computers can encourage turn-taking with a parent, teacher, peer, or even the computer itself (Jacklin & Farr, 2005). Jacklin and Farr's (2005) qualitative study led to a finding that computers can be useful tools in increasing positive social interactions by students with autism when they are used properly. "Being used properly" refers to individualizing programming to meet the specific needs of the students, as well as teacher interventions that encourage social engagement. Without carefully planned social interactions by the teacher, however, computers can be used in an unguided and obsessive manner, resulting in little improvement toward social skills. This type of compulsive behaviour is common in individuals with ASD, and there are teaching strategies that can be applied to help reduce such behaviour.

Behavioural Strategies

Children with ASD sometimes exhibit problematic behaviour that can inhibit their own learning and disrupt other students in the classroom (Ostmeyer & Scarpa, 2012). Possible examples of problematic behaviour can be difficulty in listening and following instructions, difficulty in abiding by classroom rules, and displays of repetitive behaviours that can be disruptive. In some cases, introduced situations that are meant to limit their repetitive behaviour can be stressful for individuals with autism and can instead lead to "severe irritability, aggression, self-injury, or other repetitive and problem behaviours" (Boyd et al., 2011, p. 197). For students who experience these types of behaviours, instructional and behavioural supports are usually implemented to encourage participation in academic studies (Fleury et al., 2014).

Boyd, Woodard, and Bodfish (2011) conducted a study to determine whether adapted exposure and response prevention (ERP) interventions that are used to treat obsessive compulsive disorder (OCD) would be effective in diminishing the repetitive behaviours of children with ASD who have intellectual disabilities as well. The results showed that after ERP interventions, the amount of time that the participants engaged in academic tasks, the amount of time that the participants delayed their engagement with the trigger stimulus, and the length of time that the participants went without displaying the repetitive behaviours all increased throughout the course of the study. Also, how often the repetitive behaviours were displayed decreased. These results are promising because, in addition to the desirable outcomes, during the study teachers were trained to conduct the ERP interventions. Future research is necessary to ensure the effectiveness of ERP as a treatment strategy for limiting behaviours that interfere with learning; however, the results of the study and the encouragement of informed implementation by teachers are exciting for the future.

With reference to technological interventions that might assist student with ASD, the use of iPads is emerging as a new and effective intervention for decreasing challenging behaviours in the classroom (Neely, Rispoli, Camargo, Davis, & Boles, 2013). Neely, Rispoli, Camargo, Davis, and Boles (2013) compared the use of iPads to traditional paper/pencil teaching methods for two male participants who had autism and who exhibited challenging behaviour. Both students

showed higher levels of academic engagement when using the iPads, as compared to traditional methods of instruction. The iPads acted as motivational factors for the participants and the tasks did not seem like academic "work," even though the two students were completing the same academic demands. iPads are common within most educational settings, and their informed use may be appropriate to implement.

iPads might also be used to improve transitioning skills for students with ASD (Neely et al., 2013). Transitions between schools, classrooms, and even activities can be extremely stressful for individuals with ASD, and thus can often trigger challenging behaviours (Perfitt, 2013). Considering that many individuals with ASD are visual learners, iPads have numerous applications that can provide students with visual schedules and visual timers that make transitioning much easier. Perfitt (2013) conducted a qualitative study while in the process of transitioning her students with ASD to a new school. After doing so, she made the following recommendations to help decrease stress for autistic students during transitioning:

- Include students in the development of their transition plans to ensure they have a clear understanding of what is going to happen.
- Individualize transition plans to ensure that they meet the needs of each student rather than implementing a generic transition plan for everyone.
- Predict stressors that students may encounter to pre-teach coping strategies to deal with them.
- Provide students with general strategies to deal with various forms of stress.
- Ideally, implement independent learning programs to decrease students' reliance on adult support. (Perfitt, pp. 194-195)

These are realistic strategies that can easily be incorporated into transition plans to encourage smooth and successful transitions for students with autism. Support with transitions will improve the school experience for students with ASD and will lead to fewer social and behavioural challenges, which in turn will lead to their improved attention to academics.

Academic Strategies

While behavioural strategies have been applied to aid in decreasing undesirable behaviours, educators can also implement formal academic strategies to accommodate students with ASD in reaching their academic potential. Some strategies are as simple as using technology to present learning material in a different way. Because individuals with ASD are visual learners, they typically respond well to using computers and iPads. Along with the integration of technology, adapted shared reading programs, detailed instruction, and structured learning environments are just a few strategies that can be used in the classroom.

The benefits of using computer applications for teaching social and behavioural skills to children with ASD have been articulated; however, computers can also be useful tools for teaching academic skills. Computers can be used in the same manner as iPads to engage students. Informed use of computers can also be highly motivational for students with autism (Jacklin & Farr, 2005). In Jacklin and Farr's (2005) research, a teacher noted the benefit of using computers with autistic students because they provide a "visual impact on what they are learning" (p. 208). For participating students with autism in Jacklin and Farr's study, the use of the computer was also seen as a break from traditional methods of learning, and provided the additional support necessary for those more traditional methods to be successful. Using the computer reduced, for a time, the amount of stress that the students experienced, because they were not challenged with the task of using the social skills that are required for human interactions. The computer also gave the students a sense of predictability that they may have been unable to get from humans, therefore giving them a sense of confidence and self-control when completing academic activities.

Adapted shared reading activities are emerging as a second way to enhance the literacy skills of students with autism. Shared reading is a method in which an adult reads aloud to a student while engaging that student in interaction through the use of questions and discussion (Muchetti, 2013). Shared reading activities can be modified to meet the individualized needs of students with autism. When the amount of text is shortened, while maintaining the theme, plot, and important elements, age-appropriate literature can be used (Fleury et al., 2014). Muchetti (2013) conducted a study to examine whether teacher-led shared reading activities with modified text, visual supports, and objects affected student engagement and the reading comprehension of autistic children with limited verbal communication abilities. Four children with autism between the ages of six and eight years participated in shared reading activities with trained classroom teachers. Student engagement and reading comprehension increased for all four participants during the intervention phase, as compared to the baseline phase. These outcomes are promising because they illustrate that children with autism can be engaged in early literacy activities that have been adapted to meet their needs, and that they can enhance their reading comprehension abilities in the process. Because reading comprehension is an issue for many autistic students, adapted shared reading activities are methods that classroom teachers can implement to develop their literacy skills.

To compensate for the executive functioning deficits often experienced by individuals with autism, it is necessary to break down tasks into manageable components that can be taught in several steps (Fleury et al., 2014). As a third strategy, detailed instruction is important for students with autism to acquire new academic skills. Visual supports and verbal prompting are often used, and then gradually phased out, as students learn each step individually. When teaching academic content, teachers need to provide "clear explanations of the skill or task sequence, modeling, guided practice, and multiple opportunities to independently practice and apply the learned knowledge" (Fleury et al., 2014, p. 72). When skills are taught incrementally, students have a better chance of successfully learning and eventually being able to execute the learned skills independently.

As a fourth strategy, establishing structured learning environments has been proven effective for creating conditions that will enhance the academic development of students with autism (Muchetti, 2013). Manti, Scholte, and Van Berckelaer-Onnes (2013) studied teaching strategies in a special education school located in the Netherlands, in order to determine what methods were most effective in promoting academic knowledge acquisition. The participants were 89 students, 45 of whom were autistic, and their teachers. Over a period of two years, the students participated in repeated standardized testing and the teachers completed surveys. Manti et al. discovered that the provision of structure was the strongest factor influencing the academic attainment of the students who had ASD. This result underlines the importance of well-structured educational environments because they help to decrease disruptive behaviours, anxiety, and confusion for students with ASD, therefore increasing their academic performance. Fleury et al. (2014) reiterated the importance of this approach: "Being able to anticipate and understand activities, schedules, and expectations improves students' ability to appropriately participate and respond to classroom demands" (p. 72). Teachers can establish consistent routines for their students, which will reduce the unknown and alleviate anxiety. Creating written schedules will also support autistic students who struggle with organizing their own schedules.

Using technology as a learning tool, implementing adapted shared reading activities, applying detailed differentiated instruction, and creating structured learning environments are strategies that can improve the academic performance of students with ASD. All of these strategies are practical and may not take a lot of preparation to implement. Attention to these initiatives greatly increases the chances for students with autism to excel academically.

Discussion

This literature review highlights various strategies for assisting students with ASD, which can be implemented by educators within general education or special education learning environments. All of the reviewed interventions cater to the social, behavioural, and academic challenges typically experienced by individuals with ASD. The strategies suggested are supported by research results that the elaborated initiatives contribute to the improvement of student performance in social, behavioural, and academic areas. Improvement in these areas, and increased engagement in classroom settings, will contribute to creating positive and successful experiences for students with ASD within our educational system.

Some of the strategies provided can be incorporated into teachers' repertoires without extensive preparation. That is important, because a barrier for teachers is the limited time that they have to learn about and integrate new ideas for the benefit of special needs students (Ostmeyer & Scarpa, 2012). Technology, such as computers and iPads, is available in most classrooms, and various applications can be instrumental in teaching skills in social, behavioural, and academic domains. Curricular outcomes already focus on improving literacy skills for children; therefore, the time that it takes to modify a book to include visual supports and objects for the benefit of autistic students may not be extensive. Including students in the preparation of their transition plans, and/or creating visual schedules to make transitions easier for them, will take less time out of a teacher's day than dealing with their challenging behaviour as a repercussion for not doing so.

Because of the rapidly increasing number of students who are being diagnosed with ASD, continuous professional development on this topic should be mandatory for all teachers (Fleury et al., 2014). Professional development opportunities will give educators a better understanding of what ASD is and how it affects student performance. More emphasis also needs to be placed on effective communication and collaboration between general education teachers and special education teachers (Whalon & Hart, 2010). Mentoring general education teachers about the individualized needs of their students with autism will help them to identify what areas they need to target for each student, and to create a more streamlined approach to meeting each student's specific needs (Fleury et al., 2014). Creating instructional approaches that combine the social, behavioural, and academic needs of students at the same time would also be beneficial for both educators and students.

Conclusion

There is considerable research in the area of autism; however, research examining interventions that are most effective in developing skills for children with ASD tends to focus on one specific strategy in relation to each study. With reference to a number of studies, this literature review has compiled a variety of strategies to assist educators when planning for students with ASD. Even so, there is a need for further research to examine existing interventions and to determine additional strategies that may be useful in making educational settings more conducive to learning for children who have autism (Manti et al., 2013; Muchetti, 2013). Additional research has "the potential to make an important contribution to improving the quality of school experiences, engagement in inclusive education and employment, independent living, and social relationships of young people with ASD" (de Bruin et al., 2013, p. 542). Further research into this area will extend the benefits for individuals with autism in all areas of their life.

As teachers, it is our responsibility to educate our students so as to help them become contributing citizens of society. By providing educational environments that meet the needs of students with ASD, we can help them to succeed in learning social, behavioural, and academic skills that will positively influence their current and future lives. Incorporating strategies that are individualized to meet each student's needs translates to building opportunities for every student to excel academically. Although further research is needed, implementing the strategies

presented in this literature review is a positive start to improving student performance and creating positive educational experiences for individuals with autism.

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