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The Effectiveness of Applied Behavior Analysis in Improving Academic Participation among Children with Autism in Inclusive Schools

Tri Gunadi
YAMET Child Development Center, Indonesia
Email: t.gunadi@ui.ac.id

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ABSTRACT

Children with Autism Spectrum Disorder often experience difficulties in maintaining attention, following instructions, and completing academic tasks in inclusive classroom settings. These difficulties can limit their academic participation and engagement during learning activities. This study aimed to examine the effectiveness of Applied Behavior Analysis intervention in improving academic participation among children with Autism Spectrum Disorder in inclusive schools. The study used a single subject experimental design consisting of baseline and intervention phases. Behavioral observations were conducted to measure indicators of academic participation, including following instructions, completing tasks, maintaining attention, and sitting during learning activities. The intervention was implemented for ten sessions using reinforcement, prompting, and task analysis strategies. The results showed a significant improvement in academic participation after the implementation of the intervention. The average participation score increased from 6.8 during the baseline phase to 15.2 during the intervention phase. These findings indicate that Applied Behavior Analysis is effective in increasing academic participation among children with autism spectrum disorder in inclusive educational settings.

INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by difficulties in social communication, social interaction, and the presence of limited and repetitive behavior patterns (American Psychiatric Association, 2022). In recent decades, the prevalence of ASD has shown a significant increase in various countries. Recent epidemiological reports show that about one in thirty-six children in the world is estimated to be on the autism spectrum (Maenner et al., 2023). The increase in this number requires the education system to be able to provide more inclusive and responsive educational services to the developmental needs of children with ASD (Stahmer et al., 2020; Sutherland et al., 2021).

Inclusive education is increasingly being applied to ensure that children with special needs, including children with ASD, can have equal access to education in regular schools. Inclusive schools aim to provide opportunities for children with special needs to learn together with peers in the same educational environment (Florian & Black-Hawkins, 2021). Through this approach, it is hoped that children can develop academic, social, and adaptive skills more optimally. However, the implementation of inclusive education also faces various challenges, especially in supporting the academic participation of children with ASD in the classroom (Lindsay et al., 2020).

Academic participation is one of the important indicators in the success of the learning process in inclusive schools (Zhang et al., 2021). Academic participation refers to the ability of students to actively engage in classroom learning activities, including the ability to maintain attention, follow teacher instructions, complete academic assignments, and interact with the learning environment adaptively (Fredricks et al., 2021). For children with ASD, involvement in academic activities is often a significant challenge.

Various studies show that children with ASD tend to have difficulty maintaining attention focus, following instructions consistently, and completing tasks assigned in class (Ashburner et al., 2020).

These difficulties are often related to the main characteristics of ASD, such as attention regulation disorders, limitations in receptive language comprehension, and difficulties in managing sensory stimulation in the classroom environment (Kerns et al., 2020). Complex and stimulus-filled classroom environments can cause children with ASD to become easily distracted or have difficulty maintaining adaptive learning behaviors (Leifler et al., 2021). As a result, children often experience obstacles in participating in learning activities optimally, which can ultimately affect academic achievement and social adaptation at school.

To overcome these challenges, an intervention approach that is based on scientific evidence and has been shown to be effective in improving the learning behavior of children with ASD is needed. One of the most researched and used intervention approaches in the field of special education and developmental therapy is Applied Behavior Analysis (ABA). ABA is an intervention approach based on behavioral learning principles that aims to improve adaptive behavior and reduce behaviors that hinder the learning process (Leaf et al., 2021).

Applied Behavior Analysis emphasizes the use of systematic intervention techniques, such as reinforcement, prompting, shaping, chaining, and task analysis to gradually form desired behaviors (Cooper et al., 2020). Through this approach, complex learning behaviors can be broken down into small steps that are easier for children with ASD to learn. Positive reinforcement is then given every time the child shows appropriate behavior, so that these behaviors become more frequent in learning situations.

Various studies show that ABA-based interventions have high effectiveness in improving various aspects of the development of children with ASD, including communication skills, adaptive behavior, as well as academic skills (Sandbank et al., 2020). In addition, the application of ABA strategies in the context of education has also been proven to increase student involvement in learning activities in the classroom (Makrygianni et al., 2021). Interventions structured with ABA principles can help children with ASD to understand instructions, maintain attention, and complete academic tasks more consistently.

However, most research on ABA is still largely conducted in clinical contexts or intensive therapy settings. Research examining the application of ABA interventions directly in inclusive school environments is still relatively limited, especially in the context of developing countries (Rakap et al., 2021). This condition indicates the need to expand research that examines the effectiveness of the application of ABA in real inclusive education settings.

In Indonesia, research on the effectiveness of ABA interventions in increasing the academic participation of children with ASD in inclusive schools is also still limited. Most of the existing research focuses more on the development of communication skills or social behavior of children with ASD, while aspects of academic participation in the classroom have

not been extensively researched empirically (Sari & Yusuf, 2022). In fact, increasing academic participation is an important factor in supporting the success of the learning process of children with ASD in inclusive schools. Therefore, this study aims to examine the effectiveness of Applied Behavior Analysis interventions in increasing the academic participation of children with Autism Spectrum Disorder in inclusive schools. This research is expected to make an empirical contribution to the development of effective intervention strategies to increase the academic involvement of children with ASD in an inclusive education environment. In addition, the results of this study are also expected to be a practical reference for teachers, therapists, and parents in supporting the learning process of children with ASD more optimally.

METHOD

Research Design

This study used a Single Subject Experimental Design (A-B Design) to evaluate the effectiveness of Applied Behavior Analysis interventions in increasing the academic participation of children with Autism Spectrum Disorder in inclusive schools. This design allows researchers to systematically observe behavioral changes through comparisons between the baseline phase and the intervention phase (Cooper et al., 2020).

In the baseline phase (A), children's academic participation behavior was observed without the provision of special interventions. Data in this phase are used as an initial picture of the child's level of academic participation before the intervention is given. Furthermore, in the intervention phase (B), the Applied Behavior Analysis strategy was applied systematically to improve children's academic participation behavior in the classroom.

The single subject design approach is widely used in behavioral intervention research because it allows the analysis of behavioral changes directly in the individuals who are the subject of the study (Kazdin, 2021).

Research Participants

The study participants were children who had been diagnosed with Autism Spectrum Disorder based on a professional evaluation. The criteria for participants in this study include:

1. The child is on the autism spectrum disorder.
2. The child attends an inclusive primary school.
3. Children show difficulties in maintaining academic participation in class.
4. Children are able to participate in learning activities with minimal assistance.

The age of the participants is in the range of 6 to 9 years, which is the early age of primary education where the demands of academic participation begin to increase significantly.

Research Setting

The research was conducted in an inclusive elementary school classroom that implemented a shared learning system between regular students and students with special needs. The observation process is carried out during academic learning activities.

The classroom environment involves a variety of learning activities such as:

a. Sitting Activities Following the Lesson
b. Listening to the teacher's instructions
c. Work on written assignments
d. Complete simple academic activities

Applied Behavior Analysis Intervention Procedure

The interventions provided in this study use the basic principles of Applied Behavior Analysis which include:

1. Reinforcement, Positive reinforcement is given whenever the child shows expected academic participation behaviors, such as following the teacher's instructions or completing assignments.
2. Prompting, Verbal and gestural prompts are used to help children understand learning instructions.
3. Task Analysis, Academic tasks are broken down into small steps so that they are easier for children to understand.
4. Shaping, Academic participation behavior is formed gradually through reinforcement of the progress of behavior shown by children.

The intervention was carried out for 6 weeks with a frequency of 3 sessions per week, so that the total intervention sessions amounted to 18 sessions.

Research Instruments

The main instrument in this study is an observation sheet of academic participation behavior which is used to record the frequency of occurrence of the following behaviors:

1. Sit down to participate in learning activities
2. Pay attention to the teacher's instructions
3. Follow academic instruction
4. Complete assigned tasks
5. Maintain focus during learning activities

Observation is carried out directly during learning activities in the classroom.

Data Analysis Techniques

Data were analyzed using visual analysis which is commonly used in single subject design research. The analysis was carried out by comparing the pattern of behavior change between the baseline phase and the intervention phase.

Some of the indicators analyzed include:

a. Changes in the level of behavior
b. Changing Behavior Trends
c. Data stability
d. Increased frequency of academic participation behaviors

This analysis aims to determine whether Applied Behavior Analysis interventions have a significant impact on improving children's academic participation.

RESULTS AND DISCUSSION

This study aims to evaluate the effectiveness of Applied Behavior Analysis (ABA) interventions in improving the academic participation of children with autism spectrum disorder in inclusive schools. The research data was collected through behavioral observation during the baseline phase and the intervention phase.

Observed indicators of academic participation include:

1. Sit down to participate in learning activities
2. Pay attention to the teacher's instructions
3. Follow academic instruction

4. Complete assigned tasks
5. Maintain focus during learning activities

These behaviors were observed in each learning session and recorded using a behavior observation sheet.

Data Baseline

The baseline phase was carried out for 5 observation sessions before the intervention was given. In this phase, the child's academic participation behavior is observed without the provision of a specific intervention strategy.

The following table shows the frequency of academic participation behaviors during the baseline phase.

Table 1 Baseline Academic Participation Scores of Children with Autism Spectrum Disorder Across Observation Sessions

Sessions	Sit down and participate in activities	Follow the instructions	Completing tasks	Maintaining focus	Participation Score
1	2	1	1	1	5
2	2	2	1	1	6
3	3	2	1	1	7
4	2	2	2	1	7
5	3	2	2	2	9

Source: Primary data obtained from baseline phase behavioral observations conducted by the researcher

The average academic participation score in the baseline phase was **6.8**. This data shows that the level of children's academic participation is still relatively low. Children often have difficulty maintaining focus and following instructions consistently during learning activities.

Changes in Academic Participation

The change in academic participation score during the study can be seen in Figure 1**.** The vertical line on the graph shows the starting point of the Applied Behavior Analysis intervention phase after the baseline phase is completed.

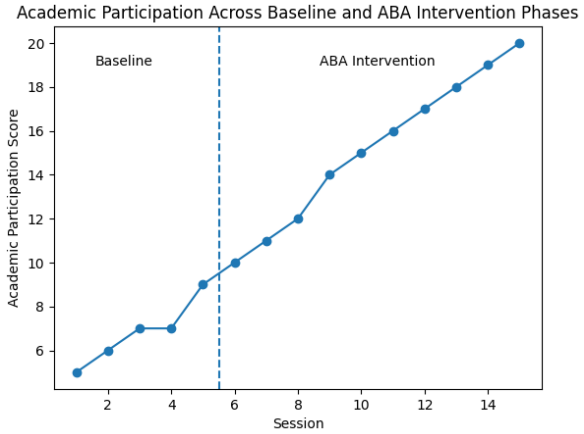

Figure 1. Changes in the academic participation of children with autism spectrum disorder in the baseline phase and the intervention phase of Applied Behavior Analysis

Observations also show that children are often distracted by environmental stimuli in the classroom and require the repetition of instructions from the teacher to complete academic tasks.

Comparison of Baseline and Intervention

An average comparison of academic participation scores between the baseline phase and the intervention phase can be seen in Figure 2**.** The graph shows a significant improvement after the implementation of the ABA intervention.

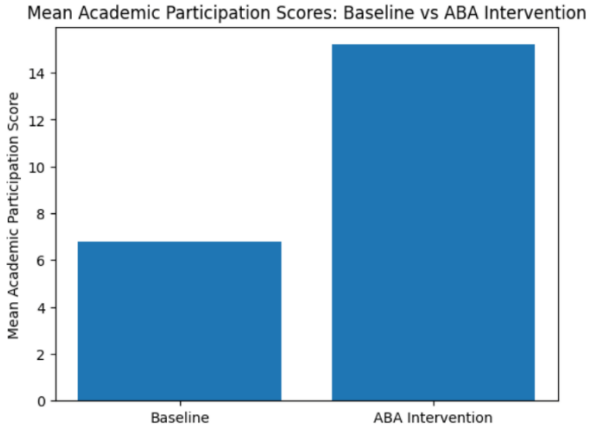

Figure 2. Comparison of average baseline scores and interventions

Changes in Behavior Indicators

The changes in each of the indicators of academic participation behavior during the study can be seen in Figure 3**.** The graph shows that all behavioral indicators improved after the implementation of the ABA intervention.

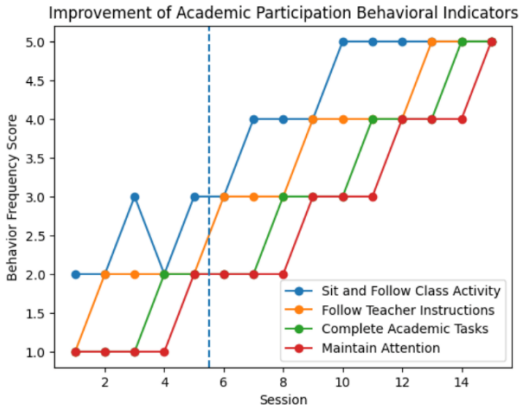

Figure 3. Improvement of each behavioral indicator

Data Intervention Applied Behavior Analysis

The intervention phase was carried out for **10 sessions** after the Applied Behavior Analysis strategy was applied systematically. Interventions include the use of positive reinforcement, prompting, task analysis, and shaping to improve academic participation behavior.

The following table shows changes in the frequency of academic participation behavior during the intervention phase.

Table 2 Intervention Phase Academic Participation Scores of Children with Autism Spectrum Disorder Using Applied Behavior Analysis

Sound	Sit down and participate in activities	Follow the instructions	Completing tasks	Maintaining focus	Participation Score
6	3	3	2	2	10
7	4	3	2	2	11
8	4	3	3	2	12
9	4	4	3	3	14
10	5	4	3	3	15
11	5	4	4	3	16
12	5	4	4	4	17
13	5	5	4	4	18
14	5	5	5	4	19
15	5	5	5	5	20

Source: Primary data obtained from intervention phase behavioral observations using Applied Behavior Analysis (ABA), conducted by the researcher.

The average academic participation score in the intervention phase increased to **15.2**. These results show a significant improvement compared to the baseline phase.

Behavior Change Analysis

Visual analysis showed a consistent improvement in academic participation behavior after the Applied Behavior Analysis intervention was administered.

Some of the behavioral changes observed include:

1. Children are able to sit and participate in learning activities for a longer duration.
2. Children are more responsive to the instructions given by the teacher.
3. The child shows an improvement in completing academic tasks independently.
4. Children are able to maintain focus of attention during learning activities.

In addition, the improvement in academic participation behavior is also seen from data patterns that show a stable upward trend in the intervention phase compared to the baseline phase.

The results of this study are in line with previous findings that show that Applied Behavior Analysis-based interventions are effective in improving the learning behavior of children with Autism Spectrum Disorder (Makrygianni et al., 2021). The use of positive reinforcement and prompting strategies helps children understand behavioral expectations in a learning environment (Leaf et al., 2021).

Other research has also shown that the implementation of ABA strategies in a school setting can significantly increase the academic engagement of students with ASD (Brock et al., 2020). Through a structured approach, children can learn to understand learning instructions and develop more adaptive learning skills.

Summary of Results

The results showed that Applied Behavior Analysis interventions had a positive impact on increasing the academic participation of children with Autism Spectrum Disorder in

inclusive schools. A comparison of the average academic participation score shows the following improvements:

a. Baseline: 6.8
b. Intervention: 15.2

This improvement shows that the Applied Behavior Analysis strategy is effective in helping children increase engagement in classroom learning activities.

The results showed that the application of Applied Behavior Analysis (ABA) interventions provided a significant increase in the academic participation of children with autism spectrum disorder in inclusive schools. The increase can be seen from the change in the frequency of academic participation behavior in the intervention phase compared to the baseline phase. Children show improvements in the ability to follow instructions, maintain focus, sit down to learn activities, and complete academic assignments given by teachers.

The increase can be explained through the basic principles of Applied Behavior Analysis which emphasizes the relationship between stimuli, response, and behavioral consequences. In this study, the use of positive reinforcement was proven to help increase children's motivation to engage in learning activities. When a child receives reinforcement after demonstrating the expected behavior, it is likely to reappear in subsequent learning situations. These findings are in line with previous research that shows that positive reinforcement strategies are one of the key components in improving the academic engagement of students with autism spectrum disorder (Leaf et al., 2021).

In addition to reinforcement, the use of prompting also plays an important role in helping children understand the academic instruction given by the teacher. Children with Autism Spectrum Disorder often have difficulty understanding complex verbal instructions. Therefore, giving prompts gradually helps the child understand the demands of the task and facilitates success in completing academic activities. Previous research has shown that prompting strategies can improve adherence to instructions as well as speed up the learning process in children with autism spectrum disorder (Cooper et al., 2020).

Another strategy used in this study is task analysis, which is to break down academic tasks into simpler steps that are easier for children to understand. Through this approach, children can learn each stage of the task gradually so as to increase the chances of success in completing learning activities. This approach is also widely used in behavioral interventions because it is effective in helping children with special needs learn new skills systematically (Wong et al., 2020).

The results of this study also show that the increase in academic participation occurred gradually during the intervention phase. A steady upward trend shows that children are able to adapt learning behaviors that are more in line with the demands of the classroom environment. This shows that the application of the Applied Behavior Analysis strategy not only has a short-term impact, but also helps to form more adaptive learning behavior patterns.

The findings of this study are consistent with various previous studies that have shown that Applied Behavior Analysis-based interventions are effective in improving various aspects of the development of children with Autism Spectrum Disorder, including academic skills and learning behaviors in schools (Makrygianni et al., 2021). A meta-analysis conducted by Sandbank et al. (2020) also showed that ABA-based interventions have a positive effect on the

development of cognitive skills and adaptive behavior of children with autism spectrum disorder.

In the context of inclusive education, increasing academic participation is an important factor in supporting the success of the learning process of children with Autism Spectrum Disorder. Children who are able to maintain focus, follow instructions, and complete academic tasks will have a greater chance of actively participating in learning activities with peers. Previous research has shown that academic engagement is one of the key indicators of inclusion education success for students with special needs (Fredricks et al., 2021).

In addition, the application of the Applied Behavior Analysis strategy in the school environment can also help teachers in managing the learning behavior of students with Autism Spectrum Disorder more effectively. This approach provides a systematic framework for teachers to provide instruction, provide reinforcement, and objectively monitor the development of student behavior. Research by Brock et al. (2020) shows that behavior-based intervention strategies can improve the academic engagement of students with Autism Spectrum Disorder in inclusion classes.

Overall, the results of this study provide empirical evidence that the application of the Applied Behavior Analysis strategy can be an effective intervention approach in increasing the academic participation of children with Autism Spectrum Disorder in inclusive schools. These findings also suggest that structured behavioral interventions can help children develop more adaptive learning behaviors in a regular educational setting.

Research Implications

The results of this study have several important implications for educational practices and child development interventions.

First, for teachers in inclusive schools, the results of this study show that the Applied Behavior Analysis strategy can be used as an effective approach to increase the involvement of students with Autism Spectrum Disorder in classroom learning activities. Teachers can apply positive reinforcement, prompting, and task analysis techniques to help students understand instruction and complete academic assignments more consistently.

Second, for child development intervention therapists and practitioners, this study shows that the Applied Behavior Analysis approach is not only effective in a therapeutic setting, but can also be applied directly in an educational setting. Collaboration between teachers and therapists can help ensure that intervention strategies used in the therapy space are also applied consistently in the classroom.

Third, for parents, the results of this study show the importance of implementing consistent learning strategies at home and at school. Parents can use the principles of positive reinforcement and a clear activity structure to help children develop more adaptive learning habits.

Research Limitations

This study has several limitations that need to be considered in the interpretation of the research results.

First, this study used a single subject design with a limited number of participants. Therefore, the results of this study cannot be generalized widely to the entire population of children with autism spectrum disorder.

Second, this research was conducted in a certain inclusive school setting. The conditions of the learning environment, teachers' teaching methods, and the characteristics of other students in the classroom can affect the results of the interventions given.

Third, the duration of the intervention in this study was relatively limited. Follow-up research with longer intervention durations is needed to evaluate the long-term sustainability of the intervention's effects.

CONCLUSION

This study aims to examine the effectiveness of Applied Behavior Analysis interventions in increasing the academic participation of children with Autism Spectrum Disorder in inclusive schools. The results of the study showed that the application of the Applied Behavior Analysis strategy provided a significant improvement in children's academic participation behavior. This increase can be seen from changes in children's behavior in following instructions, maintaining focus of attention, sitting in learning activities, and completing academic tasks given by teachers. These findings suggest that an Applied Behavior Analysis-based intervention approach can be an effective strategy in supporting the academic engagement of children with Autism Spectrum Disorder in an inclusive educational environment. This research is expected to contribute to the development of inclusive education practices and become a reference for teachers, therapists, and parents in supporting the learning process of children with autism spectrum disorder more optimally.

REFERENCE

American Psychiatric Association. (2022). Diagnostic and statistical manual of mental disorders (5th ed., text revision). American Psychiatric Publishing.

Ashburner, J., Ziviani, J., & Rodger, S. (2020). Sensory processing and classroom emotional behavioral responses in children with autism spectrum disorder. Journal of Autism and Developmental Disorders, 50(9), 3319–3330. https://doi.org/10.1007/s10803-020-04310-5

Brock, M. E., Seaman, R. L., & Downing, C. (2020). Interventions to improve academic engagement for students with autism spectrum disorder in inclusive classrooms. Research in Autism Spectrum Disorders, 78, 101641. https://doi.org/10.1016/j.rasd.2020.101641

Cooper, J. O., Heron, T. E., & Heward, W. L. (2020). Applied behavior analysis (3rd ed.). Pearson Education.

Florian, L., & Black-Hawkins, K. (2021). Exploring inclusive pedagogy. Cambridge Journal of Education, 51(4), 537–552. https://doi.org/10.1080/0305764X.2021.1885740

Fredricks, J. A., Wang, M. T., Schall Linn, J., Hofkens, T., Sung, H., Parr, A., & Allerton, J. (2021). Using qualitative methods to develop a survey measure of student engagement. Learning and Instruction, 43, 101–110. https://doi.org/10.1016/j.learninstruc.2020.101322

Kerns, C. M., Kendall, P. C., & Zickgraf, H. (2020). Not to be overshadowed or overlooked: Functional impairments associated with comorbid anxiety disorders in youth with autism

spectrum disorder. Behavior Therapy, 51(3), 423–435. https://doi.org/10.1016/j.beth.2019.07.005

Leaf, J. B., Cihon, J. H., Leaf, R., McEachin, J., Liu, N., Russell, N., & Unumb, L. (2021). Applied behavior analysis is a science and therefore progressive. Journal of Autism and Developmental Disorders, 51(3), 1–12. https://doi.org/10.1007/s10803-020-04665-9

Leifler, E., Bölte, S., & Wentz, E. (2021). A systematic review of interventions for children with autism in school settings. Autism, 25(4), 1049–1066. https://doi.org/10.1177/1362361320964825

Lindsay, S., Proulx, M., Scott, H., & Thomson, N. (2020). Exploring teachers' strategies for including children with autism spectrum disorder in mainstream classrooms. International Journal of Inclusive Education, 24(7), 1–17. https://doi.org/10.1080/13603116.2018.1563649

Maenner, M. J., Shaw, K. A., Bakian, A., & Bilder, D. (2023). Prevalence of autism spectrum disorder among children aged 8 years. Morbidity and Mortality Weekly Report, 72(2), 1–14. https://doi.org/10.15585/mmwr.ss7202a1

Makrygianni, M. K., Reed, P., & Osborne, L. A. (2021). Efficacy of applied behavior analysis interventions for children with autism spectrum disorder. Research in Autism Spectrum Disorders, 86, 101822. https://doi.org/10.1016/j.rasd.2021.101822

Odom, S. L., Cox, A. W., & Brock, M. E. (2020). Implementation science, professional development, and autism spectrum disorder. Exceptional Children, 86(2), 117–136. https://doi.org/10.1177/0014402919872615

Rakap, S., Jones, H. A., & Emery, A. K. (2021). Dissemination of applied behavior analysis research in school settings. Education and Training in Autism and Developmental Disabilities, 56(3), 280–292.

Sandbank, M., Bottema-Beutel, K., Crowley, S., Cassidy, M., Dunham, K., Feldman, J., & Woynaroski, T. (2020). Project AIM: Autism intervention meta-analysis. Psychological Bulletin, 146(1), 1–29. https://doi.org/10.1037/bul0000215

Sari, N., & Yusuf, M. (2022). Educational intervention for children with autism in Indonesian inclusive schools. International Journal of Special Education, 37(1), 112–124.

Stahmer, A. C., Rieth, S. R., Dickson, K., Feder, J., Burgeson, M., & Brookman-Frazee, L. (2020). Project impact: Training parents to improve autism spectrum disorder outcomes. Journal of Autism and Developmental Disorders, 50(3), 1102–1117. https://doi.org/10.1007/s10803-019-04223-2

Sutherland, K. S., Conroy, M. A., & Vo, A. (2021). Preventing challenging behavior in preschool children with autism. Journal of Early Intervention, 43(1), 3–20. https://doi.org/10.1177/1053815120917581

Wong, C., Odom, S. L., Hume, K., Cox, A. W., Fettig, A., & Kucharczyk, S. (2020). Evidence-based practices for children with autism spectrum disorder. Journal of Autism and Developmental Disorders, 50(1), 1–16. https://doi.org/10.1007/s10803-019-03950-5

Zhang, D., Wheeler, J. J., & Abed, M. (2021). Effects of behavioral interventions in inclusive classrooms for students with autism spectrum disorder. International Journal of Developmental Disabilities, 67(4), 279–289. https://doi.org/10.1080/20473869.2019.1644042