

The Effect of Behavioral Intervention Strategies on Improved Focus and On-Task Behavior of Students with Attention Deficit Hyperactivity Disorder in Inclusive Elementary Schools

Tri Gunadi* 

Universitas 17 Agustus 1945 Surabaya, Semolowaru St. No.45, Surabaya, East Java, 60118, Indonesia

*Corresponding author, email: dr.tri.gunadi@gmail.com

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders among school-age children and often affects students' ability to maintain attention and engagement during classroom learning activities. Students with ADHD frequently experience difficulties in sustaining attention, following instructions, and completing academic tasks consistently. These difficulties may lead to low on-task behavior and reduced learning engagement, particularly in inclusive education settings. This study aims to examine the effect of behavioral intervention strategies on improving learning focus and on-task behavior among students with ADHD in inclusive elementary schools. The study employed a Single Subject Research design using an A–B pattern consisting of baseline and intervention phases. The participant was an elementary school student diagnosed with ADHD who participated in an inclusive classroom. Data were collected through direct observation using behavioral observation sheets to measure learning focus and on-task behavior during classroom activities. The findings revealed a significant increase in the student's on-task behavior after the implementation of behavioral intervention strategies. The average on-task behavior increased from 27% during the baseline phase to 60% during the intervention phase. These results indicate that behavioral intervention strategies such as positive reinforcement, clear instructions, prompting, and token reward systems can effectively improve learning focus and classroom engagement among students with ADHD in inclusive education settings. This study provides practical implications for teachers in implementing behavioral management strategies to support the learning participation of students with ADHD in inclusive classrooms.

1. Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterized by persistent patterns of inattention, hyperactivity, and impulsivity that significantly impact a child's academic, social, and emotional functioning (American Psychiatric Association, 2022). In an educational context, students with ADHD often struggle to sustain attention on academic tasks, consistently follow teachers' instructions, and complete learning activities thoroughly, placing them at a higher risk of academic challenges compared to students without developmental disorders (Capodieci et al., 2019). This condition becomes even more complex in the context of inclusive schools, which are increasingly common in Indonesia, where teachers are required to manage heterogeneous classes with diverse learning needs. Without appropriate intervention strategies, students with ADHD risk being unable to participate optimally in learning activities alongside their peers in regular classrooms (Sibley et al., 2016).

One of the main difficulties experienced by students with ADHD in the learning process is their low ability to maintain focus and engagement in academic activities. Learning focus is a student's ability to maintain attention on a specific task for a certain period of time without being distracted by other stimuli. Meanwhile, on-task behavior refers to student behavior directly related to learning activities, such as paying attention to the teacher's explanation, completing assignments, reading lesson materials, or following given instructions (Evans et al., 2019).

Research indicates that students with ADHD tend to exhibit lower levels of on-task behavior compared to students without ADHD. They are more frequently engaged in off-task behaviors such as talking with peers, playing with objects on the desk, looking in another direction, or leaving learning activities before they are completed (Slattery et al., 2016). Low levels of on-task behavior have a direct impact on learning engagement and the academic achievement of students with ADHD in school (Wiener & Bedard, 2021).

Difficulty maintaining focus and staying on task is also closely linked to executive function deficits commonly found in children with ADHD. Executive function includes the ability to control attention, regulate behavior, plan actions, and maintain concentration on specific goals (Ramos & Lowdermilk, 2020). Impairments in executive function cause students with ADHD to struggle with managing their learning behavior independently, thus requiring a more structured learning environment.

Behavioral intervention strategies are an approach widely used in addressing behavioral and attention issues in students with ADHD. Behavioral interventions focus on modifying the learning environment and providing systematic consequences to enhance adaptive behavior and reduce undesirable behavior (Journeaux, 2023). This approach is based on the principles of behavioral learning, which emphasize the importance of reinforcement, clear instructions, and consistency in the application of classroom rules.

Various studies have shown that behavioral interventions in the classroom can significantly improve the academic engagement of students with ADHD. Strategies such as providing positive reinforcement, token reward systems, the use of prompts, and structuring learning activities have proven effective in improving the focus and on-task behavior of students with ADHD during instruction (Gaastra et al., 2016). Additionally, interventions that involve teachers as the primary implementers also yield more sustainable results because they can be directly applied in daily learning activities.

Although research on behavioral interventions for students with ADHD has developed quite rapidly in various countries, most studies are still conducted within the educational context of developed nations. Studies examining the effectiveness of behavioral intervention strategies for students with ADHD in inclusive schools in developing countries, including Indonesia, remain relatively limited (Sari et al., 2021). Furthermore, research by (Wiener & Bedard, 2021) focuses more on general school-based mental health interventions for students with ADHD, indicating a limited emphasis on the direct application and effectiveness of specific behavioral strategies within inclusive classroom learning contexts.

Based on the above discussion, this study aims to analyze the effect of behavioral intervention strategies on improving academic focus and on-task behavior among students with Attention Deficit Hyperactivity Disorder in inclusive elementary schools. This study is expected to provide empirical evidence regarding the effectiveness of behavioral intervention strategies and to offer practical recommendations for teachers and education practitioners in supporting the success of inclusive education.

2. Method

2.1. Research Design

This study employs a Single Subject Research (SSR) design with an A–B pattern to analyze changes in learning focus and on-task behavior among students with Attention Deficit Hyperactivity Disorder following the implementation of behavioral intervention strategies in an inclusive classroom. The Single Subject Research design is widely used in special education and educational psychology research because it allows researchers to observe behavioral changes in a real-time, direct, and un manner in the individual who is the subject of the study through a comparison of conditions before and after the intervention (Ledford, J.R., & Gast, D.L., 2018).

This design consists of two main phases: the baseline phase (A) and the intervention phase (B). The baseline phase comprises five observation sessions used to assess students' behavioral conditions prior to the intervention. During this phase, the researcher observed students' learning focus and on-task behaviors throughout the learning activities without providing any special treatment. Next, the intervention phase consists of 8 observation sessions, during which the researcher systematically applies behavioral intervention strategies in the classroom learning process to enhance students' learning engagement (Kazdin, 2019).

2.2. Research Subjects

The research subject is an elementary school student identified as having Attention Deficit Hyperactivity Disorder (ADHD) and attending an inclusive elementary school. The ADHD diagnosis was based on the results of a psychological evaluation referencing the diagnostic criteria outlined in *the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision* (DSM-5-TR) (American Psychiatric Association, 2022). Subject characteristics include: a lower-grade elementary school student; exhibiting symptoms of difficulty sustaining attention; frequently leaving learning activities before tasks are completed; easily distracted by environmental stimuli; and exhibiting impulsive behavior during learning. Subject selection was conducted using purposive sampling (Ledford, J.R., & Gast, D.L., 2018).

2.3. Research Locations

The study was conducted at an inclusive elementary school that implements a co-learning system between regular students and students with special needs. Inclusive schools provide students with developmental

disorders, such as ADHD, the opportunity to participate in the learning process in regular classrooms with the support of special education services (Florian, 2019).

2.4. Research Variables

This study involves two main variables, namely: (1) Independent variable: behavioral intervention strategies implemented during the classroom learning process; (2) Dependent variable: learning focus and on-task behavior during learning activities. 's learning focus is defined as a student's ability to maintain attention on learning activities without being distracted by other stimuli. On-task behavior refers to a student's active engagement in learning activities such as paying attention to the teacher's explanations, reading materials, writing assignments, and following given instructions (Evans et al., 2019).

2.5. Research Instruments

The instrument used in this study was a behavioral observation sheet used to record students' levels of learning focus and on-task behavior during learning activities. Observations were conducted directly in the classroom.

The behavioral observation sheet was developed based on behavioral indicators drawn from the literature on ADHD behavioral interventions (Evans et al., 2019; Journeaux, A., 2023). The content validity of the instrument was assessed by two experts in educational psychology and special education using the Content Validity Index (CVI) formula. The assessment results showed a CVI value of 0.87, which falls within the valid category (CVI ≥ 0.80).

Inter-rater reliability was tested by having two observers conduct simultaneous observations during the same session. The level of inter-rater agreement was calculated using the Percentage of Agreement (POA) formula. The reliability test results showed an average agreement percentage of 89.5%, which is above the minimum standard of 80% for observational research in special education (Kazdin, 2019). This indicates that the observation instrument used has sufficient consistency to measure students' learning focus and on-task behavior.

The observed indicators of learning focus include: paying attention to the teacher's explanations; maintaining visual contact during learning activities; following learning instructions; and not being easily distracted by environmental stimuli. The indicators of on-task behavior include: working on tasks assigned by the teacher; remaining seated during learning activities; following learning activities according to instructions; and completing tasks until finished.

2.6. Intervention Procedure

Behavioral intervention strategies were implemented during the intervention phase of the study with the aim of improving the learning focus and on-task behavior of students with ADHD. The interventions were conducted during learning activities in the inclusive classroom. Table 1 below presents a summary of the intervention strategies used, along with a description of their implementation and objectives.

Table 1. Summary of Behavioral Intervention Strategies

Strategy	Implementation Description	Objective
Positive Reinforcement	The teacher provides positive reinforcement in the form of verbal praise, simple rewards, or reward points when students demonstrate focused behavior or complete tasks well.	Increases motivation and on-task behavior
Clear Instructions	Learning instructions are delivered concisely, specifically, and in a structured manner to make them easier for students with ADHD to understand.	Helps students understand task expectations
Prompting	Teachers provide additional assistance or guidance (verbal/physical) when students begin to lose focus during learning activities.	Preventing off-task behavior early on
Token Reward System	Students earn tokens or points every time they successfully maintain focus or complete a task. Tokens can be exchanged for simple rewards.	Improving long-term consistency in focused behavior

The strategy described above is based on the principles of behavioral intervention, which emphasize the use of positive reinforcement and the structure of the learning environment to improve adaptive behaviors in students with ADHD (Gaastra et al., 2016).

2.7. Data Collection Procedure

Data collection was conducted through direct observation of student behavior during classroom learning activities. Observations were conducted during each learning session in both the baseline and intervention

phases. The data collection stages included: (1) observing student behavior during the baseline phase without intervention; (2) recording the frequency of target behaviors and on-task behaviors during learning activities; (3) implementing behavioral intervention strategies during the intervention phase; (4) recording changes in student behavior during the intervention. Data collection was conducted systematically to ensure that behavioral changes could be analyzed objectively (Kazdin, 2019).

2.8. Data Analysis Techniques

Research data were analyzed using graphical visual analysis, a common technique in Single Subject Research. This analysis involved comparing changes in student behavior between the baseline and intervention phases, including: the degree of change in focused learning and on-task behavior; trends in behavioral improvement during the intervention phase; and the stability of behavior after the intervention was implemented (Alqraini, F., 2017).

3. Results and Discussion

3.1. Results

This section presents the results of observations regarding changes in the learning focus and on-task behavior of students with Attention Deficit Hyperactivity Disorder during the baseline and intervention phases. Data were collected through direct observation during learning activities in the inclusive classroom. The percentage of on-task behavior was calculated based on the ratio of the time students spent engaged in learning activities to the total duration of the 30-minute learning session (Slattery et al., 2016).

3.1.1. Observation Results in the Baseline Phase

The baseline phase was conducted to determine the initial condition of students' learning focus and on-task behavior before behavioral intervention was provided. Observations were conducted during five learning sessions. The observation results showed that during the baseline phase, students often had difficulty maintaining attention on learning activities, were easily distracted by environmental stimuli, and frequently abandoned tasks before completion (see Table 2).

Table 2. Percentage of On-Task Behavior in the Baseline Phase

Observation Session	Duration of Focus (minutes)	Percentage of On-Task Behavior
Baseline 1	8	27%
Baseline 2	9	30%
Baseline 3	7	23%
Baseline 4	8	27%
Baseline 5	9	30%

The results of the observations indicate that during the baseline phase, students' average on-task behavior accounted for approximately 27 percent of the total learning duration. These data suggest that the majority of students' learning time was spent on off-task behavior. This finding is consistent with previous research indicating that students with ADHD often exhibit low levels of on-task behavior (Wiener & Bedard, 2021).

3.1.2. Observation Results in the Intervention Phase

After the baseline phase was completed, the researchers implemented behavioral intervention strategies in classroom learning activities. The interventions provided included positive reinforcement, clear instructions, prompting, and the use of a token reward system. Observations were conducted over eight learning sessions (see Table 3).

Table 3. Percentage of On-Task Behavior in the Intervention Phase

Observation Session	Duration of Focus (minutes)	Percentage of On-Task Behavior
Intervention 1	12	40%
Intervention 2	14	47%
Intervention 3	16	53%
Intervention 4	18	60%
Intervention 5	19	63%
Intervention 6	21	70%
Intervention 7	22	73%
Intervention 8	23	77%

The observation results showed a significant increase in students' focus on learning and on-task behavior after the behavioral intervention was implemented. The percentage of on-task behavior increased from 40 percent at the start of the intervention phase to 77 percent during the final observation session.

3.1.3. Behavior Change Analysis

The data on Table 4 show that the average on-task behavior of students increased from 27 percent in the baseline phase to 60 percent in the intervention phase. This increase indicates that the implementation of behavioral intervention strategies has a positive impact on the learning engagement of students with ADHD, consistent with previous findings (Journeaux, A., 2023.; Gaastra et al., 2016).

Table 4. Comparison of Average On-Task Behavior

Research Phase	Average On-Task Percentage
Baseline	27%
Intervention	60

3.1.4. On-Task Behavior Improvement Trend

Analysis of the behavioral change graph indicates a steady upward trend during the intervention phase. The increase occurred gradually from the first intervention session to the last, suggesting that the intervention strategies not only provided short-term effects but also helped students develop more adaptive learning behavior patterns (Power et al., 2022; Santos & Albuquerque, 2019).

3.2. Discussion

The findings of this study empirically confirm that classroom-based behavioral intervention strategies effectively improve learning focus and on-task behavior among students with ADHD in an inclusive setting. The average increase in on-task behavior from 27% to 60% indicates that modifying the learning environment through systematic reinforcement yields clinically and practically meaningful behavioral changes.

The primary interpretation of these findings points to the operant conditioning mechanisms underlying all components of the intervention. The use of positive reinforcement and a token- -reward system creates clear behavioral contingencies for students with ADHD, allowing them to understand the relationship between the focused behavior they exhibit and the consequences they receive. This mechanism is particularly relevant for students with ADHD who have limitations in self-regulation and executive function, thus requiring more immediate and consistent external consequences (Ramos & Lowdermilk, 2020).

The use of prompting strategies and clear instructions also has important theoretical implications. Brief and specific instructions accommodate the working memory limitations of students with ADHD, thereby reducing the cognitive load that can lead to off-task behavior (Faraone et al., 2021). These findings align with the research by DuPaul et al. (2021), which emphasizes that a structured learning approach can improve attention regulation skills in students with ADHD.

From a practical perspective, the findings of this study offer several recommendations for teachers in inclusive schools. First, teachers can implement a simple reinforcement system without requiring significant resources; consistent and structured verbal praise is sufficient. Second, brief and measurable instructions can be implemented immediately without fundamental changes to the curriculum. Third, token reward strategies can be tailored to students' preferences and ages to maximize their effectiveness.

The teacher's role as the primary implementer of interventions is a key determinant of this approach's success. Teachers with a good understanding of ADHD characteristics can consistently apply behavior management strategies and respond to students' individual needs (Sibley et al., 2022). This underscores the importance of teacher training programs as an essential component in the implementation of quality inclusive education.

The limitations of this study include the use of a single-subject design with a single participant, which limits the generalizability of the results. Future research is recommended to involve a larger sample size, employ a multiple-baseline design, and evaluate the long-term sustainability of the intervention's effects to obtain stronger evidence regarding the effectiveness of classroom-based behavioral interventions in inclusive schools.

4. Conclusion

This study demonstrates that behavioral intervention strategies significantly improve academic focus and on-task behavior among students with ADHD in inclusive elementary schools, as evidenced by an increase in the average on-task behavior rate from 27% during the baseline phase to 60% during the intervention phase (77% in the final session). The use of positive reinforcement, clear instructions, prompting, and a token reward system

proved effective in helping students with ADHD maintain consistent and gradual academic engagement over the eight intervention sessions. These findings provide significant practical implications for inclusion classroom teachers to implement classroom-based behavior management strategies as a viable, measurable, and sustainable approach to supporting the learning success of students with special needs; further research is recommended to involve more subjects with longer observation periods to strengthen the generalizability of the findings.

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The sole author has read and approved the final manuscript and is fully responsible for its content.

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Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

Data Availability

The datasets generated during and/ or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration on AI Use

The author declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript.

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