

Running Head: Instructional Strategies and Attention Deficits

Improving the Classroom for Students:
What are Effective Instructional Strategies for
Children with Attention Deficits?

A Master's Research Project Presented to
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This Master's Research Project has been approved

for the Department of Teacher Education

A handwritten signature in cursive script that reads "Dianne M. Gut". The signature is written in dark ink and is positioned above a solid horizontal line.

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Abstract

Authorities propose that children with Attention Deficit Hyperactivity Disorder constitute 3 to 5 percent of the student population in the United States (Purdie, Hattie, & Carroll, 2002; Sharpes, 1999; Stevens, 1997). Throughout many classrooms, maintaining the attention of students is an ongoing challenge that teachers encounter on a daily basis. The U.S. Department of Education (2008) proposes various instructional strategies to assist teachers in their interactions with students diagnosed with Attention Deficit Hyperactivity Disorder. The behavior interventions implemented within this study include: hand signals, extrinsic rewards, peer mediation, and visual cues. The results exhibited an increasing trend of desired on-task behaviors from students with ADHD. Although most research studies have focused on pharmacological interventions, this particular study analyzes the simple implementation of behavioral interventions.

Throughout many classrooms, maintaining students' attention is an ongoing challenge that teachers encounter on a daily basis. A checklist with the following symptoms may be used to alert teachers and parents to children that may have attention deficits (Lawlis, 2004):

- fails to pay close attention to details or makes careless mistakes in schoolwork or other activities;
- avoids, dislikes, or is reluctant to engage in tasks that require sustained concentration and effort;
- does not seem to listen when directly spoken to;
- does not often follow through on instructions and fails to finish school work, chores, or duties;
- has difficulty organizing tasks and activities; and
- loses things necessary for tasks or activities; and is forgetful in daily activities.

In various teachers' classrooms, students that exhibit these characteristics may be encountered on a daily basis. Moreover, managing students' behavior in a manner that allows productive learning experiences for all is a crucial theme in today's academic setting.

Heward (2003) defines Attention Deficit/Hyperactivity Disorder (ADHD) as a "diagnostic category of the American Psychiatric Association for a condition in which a child exhibits developmentally inappropriate inattention, impulsivity, and hyperactivity" (p. 611). In most classrooms, it is evident that children's academic success is often dependent on their ability to attend to tasks. The ability to attend to tasks may empower students to perform and experience success and growth in their academics. Such skill

enables students to acquire necessary information, complete assignments, and participate in classroom activities and discussions (Forness & Kavale, 2001).

Improving all students' learning opportunities is an ongoing challenge encountered by many educators. Educators' abilities to manage classrooms with diverse student populations are crucial to all stakeholders. Emphatically, this is true in regards to maintaining students' attention within the classroom environment as well. The ability to attend to critical features of a task is a characteristic of efficient learners (Heward, 2003). Statistics reveal there are a large percentage of children with ADHD. There are estimated to be between 1.46 to 2.46 million children with ADHD in the United States; constituting 3 to 5 percent of the student population (Stevens, 1997). Moreover, research reveals that more boys than girls are diagnosed with Attention Deficit Hyperactivity Disorder (Bender, 1997; Purdie, Hattie, & Carroll, 2002).

In order to improve classroom environments that nurture positive learning experiences for all students, it is important to investigate which interventions teachers can utilize to ensure that students are efficient learners. Reflective opportunities exist for teachers who attempt various instructional strategies that attempt to focus on maintaining student attention. Behavioral interventions are a group of strategies that teachers might attempt in their classrooms. The principles and methods of applied behavior analysis, particularly positive reinforcement for on-task behavior, modifying assignments, and instructional activities to promote success, and eventually teaching self-control, provide teachers and parents with practical strategies for teaching and living with children with ADHD (Flick, 2000; Goldstein & Goldstein, 1998). After the implementation of such

behavioral interventions, teacher reflection allows for adjustments to ensure that student behavior facilitates efficient learning experiences for all students.

Literature Review

A review of literature was conducted in order to provide a perspective of attention deficits and in particular, Attention Deficit Hyperactivity Disorder (ADHD). The following literature review provides the definitions and characteristics of ADHD. Moreover, a review of some instructional strategies and behavioral interventions utilized in classrooms will be presented in order to ensure that all students are provided future opportunities for efficient learning experiences.

Definitions of Attention Deficit Hyperactivity Disorder

The Diagnostic Statistical Manual of Mental Disorders (DSM-IV) of the American Psychiatric Association (APA) (1994), states that ADHD can be defined by observed behaviors. Some of the behaviors exhibited by individuals with ADHD are as follows (American Psychiatric Association, 1994):

- fidgeting with hands or feet or squirming in their seat;
- difficulty remaining seated when required to do so;
- difficulty sustaining attention and waiting for a turn in tasks, games, or group situations;
- blurting out answers to questions before the questions have been completed;
- difficulty following through on instructions and in organizing tasks;
- shifting from one unfinished activity to another;
- failing to give close attention to details and avoiding careless mistakes;
- losing things necessary for tasks or activities;
- difficulty in listening to others without being distracted or interrupting;

- wide ranges in mood swings; and
- great difficulty in delaying gratification.

Moreover, these behaviors are representative of what the U.S. Department of Education (2008) describes as the core symptoms of Attention Deficit Hyperactivity Disorder (ADHD): inattention, hyperactivity, and impulsivity (p. 1). In addition, Heward (2003) proposes that symptoms of ADHD occur in two broad dimensions: those indicative of faulty attention and those related to hyperactivity and impulsivity (p. 252). Conclusively, diagnosing physicians assign one of three sub-types of ADHD, depending on a child's constellation of symptoms: ADHD, combined type; ADHD, predominantly inattentive type; and ADHD, predominantly hyperactive-impulsive type (Purdie, Hattie, & Carroll, 2002; Seward, 2003). Approximately half of the children tested for ADHD are diagnosed with the combined type, 30% the inattentive type, and 20% the hyperactive-impulsive type (Lahey et al., 1994).

In regards to the student population across the United States, statistics exist as to how many students are diagnosed with ADHD. The U.S. Department of Education (2008) stated that an estimated 1.46 to 2.46 million children are diagnosed with ADHD in the United States (p. 1). Some authorities propose that children with ADHD constitute 3 to 5 percent of the student population in the United States (Purdie, Hattie, & Carroll, 2002; Sharpes, 1999; Stevens, 1997). Graham-Day, Gardner, and Hsin (2010) concur that 3 to 5 % of school-aged children and adolescents have ADHD (p. 205). Moreover, on a global basis, Piscalkiene (2009) states that 7 to 10% of children are diagnosed with ADHD. Regardless, it is evident that teachers in the United States need to utilize various

methods and interventions to ensure that all students are provided with efficient learning opportunities in classrooms.

Causes of Attention Deficit Hyperactivity Disorder

ADHD has several different identified causes. Most experts believe that it is primarily an inherited, neurobiological disorder (Gregg, 1995). ADHD is thought to be caused by a chemical imbalance in the brain, specifically the lack of production of neurotransmitters necessary for concentration (Sharpes, 1999). Although most experts believe that ADHD is primarily an inherited, neurobiological disorder, the specific causes of the inattention and hyperactivity-impulsivity that lead to a child's diagnosis are often unknown (Heward, 2003). Heward states, "ADHD is associated with a wide range of genetic disorders and diseases" (p. 255). Additionally, symptoms of ADHD are also associated with conditions such as fetal alcohol syndrome, prenatal exposure to cocaine, and lead poisoning (Heward). Regardless of the cause of ADHD, it is evident that students with this condition need instructional strategies and behavioral interventions that allow for efficient learning experiences.

Instructional Strategies and Behavioral Interventions

The U.S. Department of Education (2008) proposes the integration of three components utilized by successful programs, which include academic instruction, behavioral interventions, and classroom accommodations (p. 5).

With regard to *academic instruction*, a number of teaching-related practices derived from the U.S. Department of Education (2008) are considered useful and are as follows: provide an advance organizer; review previous lessons; set learning expectations; set behavioral expectations; state needed materials; explain additional

resources; and simplify instructions, choices, and scheduling (p. 6). In terms of *classroom accommodations*, various suggestions are made that teachers may utilize across the curriculum to assist students with ADHD (U.S. Department of Education, 2008). In addition to the components of *academic instruction* and *classroom accommodations*, the final component involves *behavioral interventions*.

According to the U.S. Department of Education (2008), “the purpose of behavioral interventions is to assist students in displaying behaviors that are most conducive to their own learning and that of their classmates” (p. 20). Some suggestions provided by the U.S. Department of Education (2008) include praise/verbal reinforcement, selectively ignoring inappropriate behavior, removing nuisance items, providing calming manipulatives, allowing for ‘escape valve’ outlets, activity reinforcement, hurdle helping, parent conferences, and peer mediation (pp. 22 – 23). Within the same publication they mention behavioral prompts, which include visual cues, proximity control, and hand gestures (U.S. Department of Education, 2008). Notably, it is true that various methods and strategies may be implemented in the classroom setting to ensure that all students have effective and efficient learning opportunities. It is obvious that maintaining “on-task behavior” with students in a classroom setting is crucial to classroom management. This all leads to the question – What are effective instructional strategies for children with attention deficits?

Research-Based Interventions for ADHD

When dealing with students with Attention Deficit Hyperactivity Disorder, it is necessary to understand that some students may be taking medication. Therefore, teachers must understand the importance of collaborating with family members,

physicians, and the school nurse to manage, monitor, and evaluate students' response to medication (Salend, 2005). A recent meta-analysis reveals that most research on students with ADHD were focused on pharmacological interventions (Purdie, Hattie, & Carroll, 2002).

Purdie, Hattie, and Carroll (2002) performed a "meta-analysis that attempted to summarize the research findings of studies designed to improve the behavioral, cognitive, and/or social functioning of people with attention deficit hyperactivity disorder" (p. 61). Various interventions were introduced and analyzed in this study including pharmacological interventions, behavioral interventions, cognitive behavioral interventions, parental interventions, educational interventions, and multimodal interventions (Purdie, Hattie, & Carroll). Results of their meta-analysis revealed that "most research on ADHD has been conducted from within a medical framework and has focused on the effects of pharmacological treatments on behaviors" (p. 85). The authors propose that the meta-analysis is unique in several ways. That is, "the meta-analysis synthesized findings from studies that span the full range of treatment , whereas previous studies have focused on pharmacological interventions or behavioral interventions or educational interventions, but not all" (Purdie, Hattie, & Carroll, 2002, p. 86).

Ironically, Purdie, Hattie, and Carroll (2002) reveal that "very few studies assessed the effects of school-based interventions on children with ADHD" (p. 85). Moreover, when children with ADHD are given medication, there is only a small improvement in their cognitive abilities – less than when they participate in school-based interventions (Purdie, Hattie, & Carroll). Therefore, it is clear that educational outcomes are to be enhanced by educational interventions, which need to be provided, as opposed

to medical answers (Purdie, Hattie, & Carroll). Evidence demonstrates that little focus has been placed on studies involving school-based interventions. Therefore, it is vital to research and develop effective instructional strategies for children with attention deficits.

Collecting and Recording Baseline Data

Walker, Shea, and Bauer (2004) describe a process of collecting data and state that “qualitative data collected before the behavior change intervention has been implemented is referred to as baseline data” (p. 90). Collection of baseline data is crucial to behavioral research in order to make comparisons of behaviors before and following an intervention. Notably, the process of collecting preintervention (baseline) data provides the foundation to which the behavior change process is established (Walker, Shea, & Bauer). In regards to discovering effective instructional strategies, it is also used to determine the effectiveness of the intervention during the evaluation step of the behavior step process (Walker, Shea, & Bauer).

It is with the previous literature in mind, that this study was designed to identify effective instructional strategies for children with attention deficits.

Methodology

The purpose of this study was to identify which intervention strategies might be effective for children with attention deficits to increase appropriate on-task behavior. Behavioral interventions are utilized to assist students in displaying the behaviors that are most conducive to their own learning (U.S. Department of Education, 2008). In this study, on-task student behavior was demonstrated by following directions, responding to questions in an appropriate manner, remaining in a seat, and completing assignments.

Participants

This research was conducted in an intermediate school building in rural Southern Ohio. The study was implemented in a fourth grade inclusive math class consisting of 24 students. There are approximately 475 students enrolled in the intermediate school. The six participants in the study were classmates in a fourth grade inclusive math class, which met for 45 minutes each day. The class period was scheduled from 12:30 p.m. to 1:15 p.m. All six students exhibited characteristics of attention deficits. The participants' ages range from nine to ten years old. Five of the participants were male, while the remaining student was female. This ratio is not surprising, as many studies have revealed that Attention Deficit Hyperactivity Disorder (ADHD) is more prevalent among males than females (Purdie, Hattie, & Carroll, 2002; Seward, 2003; U.S. Department of Education, 2008) Five of the participants were Caucasian, while the final participant was bi-racial.

Of the six participants, five had identified disabilities and received services under IDEA. The remaining participant was considered "at-risk" by the general education teacher due to low achievement. Two of the participants were near grade level in mathematics. One participant was one grade level behind in mathematics, while three participants were at least two grade levels behind in mathematics.

Instrumentation

The process of collecting preintervention (baseline) data provided the foundation to which the behavior change process was compared (Walker, Shea, & Bauer, 2004). Therefore, a frequency table was used to record each student's inappropriate behavior during each phase of the research (Appendix A, B, C). Data was collected in a fourth

grade, inclusion mathematics class from 12:30 p.m. to 1:15 p.m. each day. Target behaviors were identified and data collected by the researcher on the frequency table for each individual participant. Data included appropriate responses to questions, remaining in a seat, completing assignments, and following directions. See the appendix for the data collection instrument.

Procedures

Participants were monitored in the fourth grade inclusive math classroom without any use of interventions over a period of three days, while frequency data regarding on-task student behavior was collected. Baseline data was established when students were observed during an inclusive fourth grade math class which lasted for 45 minutes from 12:30 p.m. to 1:15 p.m. in the afternoon. Data was recorded on a frequency chart - utilizing tally marks. Target behaviors included responding to questions in an appropriate manner, remaining seated, completing assignments, and following directions.

The teacher/researcher individually implemented an intervention strategy (hand signals, extrinsic rewards/visual cues, peer mediation, visual cues) for the participants and monitored progress of their behavior over a period of three days. The aforementioned instructional strategies are proposed by the U.S. Department of Education (2008, p. 23). Each intervention strategy took place during an inclusive fourth grade math class for 45 minutes from 12:30 p.m. to 1:15 p.m. in the afternoon.

The various strategies included using behavioral prompts such as visual cues, proximity control, and hand gestures, along with verbal and extrinsic reinforcement of appropriate behavior. For example, the teacher would point at the child while looking him or her in the eye, or holding out his hand, palm down, near the child. Proximity

control is when the teacher moves to where the student is sitting or standing to help the student focus (U.S. Department of Education, 2008). Hand signals can be used to communicate with a child privately. A social reinforcer, verbal reinforcement, is praise given to a student who exhibits a desired behavior (Walker, Shea, & Bauer, 2004).

The teacher again collected frequency data regarding on-task behaviors during an inclusive fourth grade math class for 45 minutes from 12:30 p.m. to 1:15 p.m. This was completed over a period of three days. Once again, data was recorded on a frequency chart using tally marks. In addition, the teacher ceased the intervention strategy. Finally, the teacher collected frequency data regarding on-task student behavior as previously mentioned to observe and compare how the strategy impacted the participants' behavior when the behavioral strategies were removed.

Results

The purpose of this study was to determine if the outlined behavioral strategies were effective for children with attention deficits. Evaluating the data for each target behavior suggests that providing interventions to students did in fact increase on-task behavior for students in an inclusive math class who exhibited characteristics of attention deficits.

Figure 1

Frequency of Talking Out Behavior

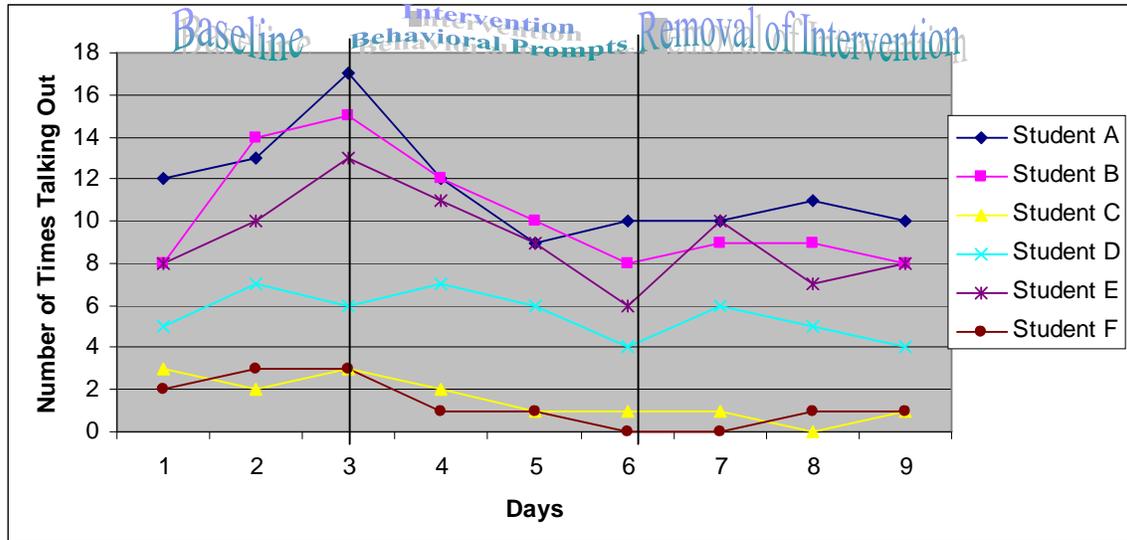


Figure 1 shows the number of times participants *talked out* in the fourth grade inclusive math class. Phase 1, running from day 1 through 3, was the baseline phase where data was collected for targeted on-task behaviors before the intervention was implemented. Phase 2 (days 4 through 6) was the implementation of the intervention, which included *behavioral prompts* or use of *hand signals* by the teacher. Frequency data was again collected by the researcher for the targeted on-task behaviors. Phase 3 (days 7 through 9) was the removal of the intervention. Data was again collected to see if student on-task behavior was affected by the removal of the intervention or maintained. Figure 1 exhibits a decrease in the number of times students *talked out* after the intervention was implemented, while revealing a slight increase or decrease throughout phase 3.

Figure 2

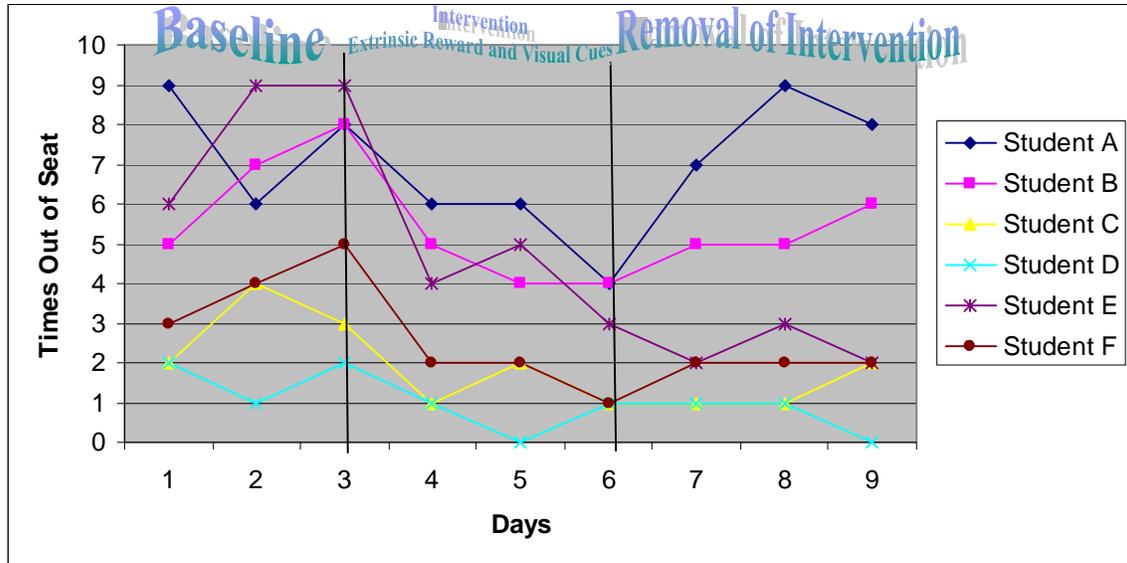
Frequency of Out of Seat Behaviors

Figure 2 represents the number of times participants were out of their seat during a fourth grade inclusive math class. Phase 1 (days 1 through 3) displays the baseline phase, where data was collected for targeted on-task behaviors before the interventions (extrinsic rewards and visual cues) were implemented. Phase 2 (days 4 through 6) was the implementation of the interventions, which included extrinsic rewards (10 minutes of computer time) and visual cues. Frequency data was collected by the researcher for the targeted on-task behavior (remaining in a seat). Phase 3 (days 7 through 9) involved the removal of the intervention. Data was collected using a frequency chart. The information collected was used to determine if student on-task behavior was affected by the removal of the intervention. Figure 2 displays a slight decrease in the number of times participants were out of their seat after the intervention was implemented; however, some participants exhibited the targeted on-task behavior throughout phase 3.

Figure 3

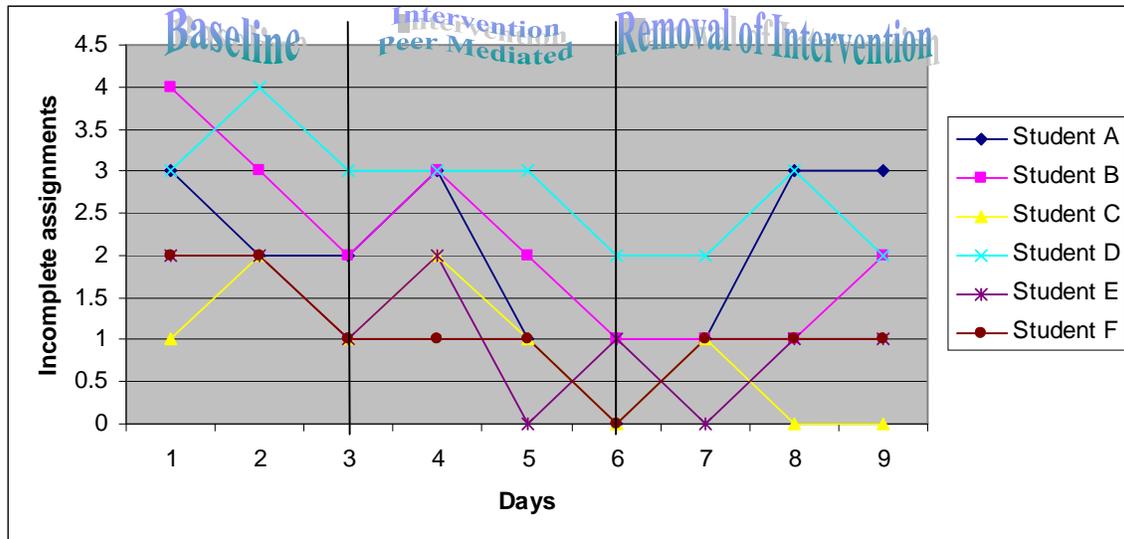
Frequency of Incomplete Assignments

Figure 3 shows the number of times participants failed to turn in completed assignments in a given time period, during a fourth grade inclusive math class. Phase 1 (days 1 through 3) represents the baseline phase where data was collected for targeted on-task behaviors before the implementation of the intervention. Phase 2 (days 4 through 6) took place during the implementation of the intervention, which was peer mediated instruction (students worked in pairs). Data was collected by the researcher utilizing a frequency chart for targeted on-task behaviors. The removal of the intervention occurred during phase 3 (days 7 through 9). Frequency data was collected to allow for teacher analysis of on-task behavior, and to determine the impact of the removal of the intervention. Figure 3 shows sporadic patterns in the number of times participants failed to turn in completed assignments in a required time period after the intervention was implemented.

Figure 4

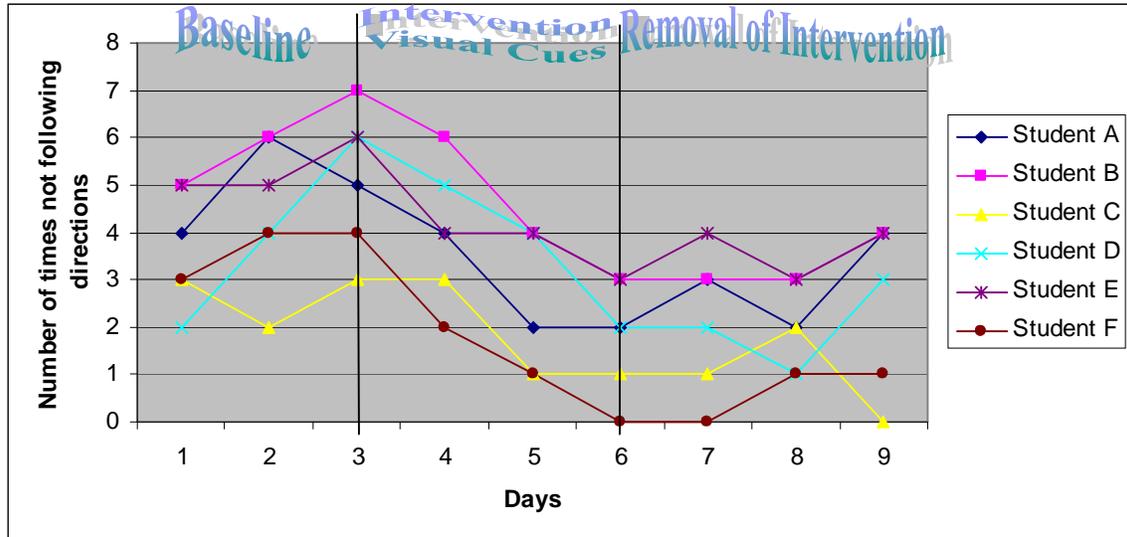
Frequency of Failure to Follow Directions

Figure 4 shows the number of times participants did not follow directions on assignments during a fourth grade inclusive math class. Phase 1 (days 1 through 3) represented the baseline phase, where data was collected for targeted on-task behaviors before implementation of the intervention. The intervention occurred during phase 2 (days 4 through 6). The implementation of visual cues given by the teacher allowed for the collection of data by the researcher. Phase 3 (days 7 through 9) involved the removal of the intervention. Data was collected to see if student on-task behavior was affected by the removal of the intervention. Conclusively, Figure 4 shows a decrease in the number of times participants did not follow directions on assignments after the intervention was implemented. Notably, minimal change is displayed throughout phase 3.

Discussion, Recommendations and Conclusion

This study was designed to explore the effectiveness of a select number of research-based instructional strategies for students with attention deficits. The findings

suggest that implementing behavioral interventions for students who exhibit characteristics of attention deficits increases on-task student behavior. Moreover, the data shows that the removal of the intervention resulted in both an increase and decrease in on-task student behavior.

When a child exhibits behaviors associated with ADHD, consequences may include difficulties with academics and with forming relationships with his or her peers if appropriate instructional methodologies and interventions are not implemented (U.S. Department of Education, 2008). In an effort to better understand instructional strategies and behavioral interventions (school-based interventions) and their impact on students with attention deficits, this research study was enacted. Generally, the data collected during this study showed students trended towards desired on-task behaviors. The implementation of the various instructional strategies/behavioral interventions resulted in the desired on-task behavior, which verifies the utilization of such techniques as proposed by the U.S. Department of Education (2008).

Notably, it should be realized that most studies that address Attention Deficit Hyperactivity Disorder have been focused on pharmacological interventions (Purdie, Hattie, & Carroll, 2002). Heward (2003) stated that “prescription stimulant medicine is the most common intervention for children with ADHD” (p. 256). Since prescription medication is the most common intervention, this may explain why most ADHD studies focus on pharmacological interventions included in the meta-analysis (Purdie, Hattie, & Carroll, 2002).

Purdie, Hattie, and Carroll (2002) reveal that “very few studies assessed the effects of school-based interventions on children with ADHD” (p. 85). Therefore, it

would make sense to pursue a research study on ADHD that involved school-based interventions such as instructional strategies and behavioral interventions. The findings of the present study supported previous studies demonstrating the use of behavior management techniques in combination with medication can be more effective than medication by itself (Purdie, Hattie, & Carroll, 2002). Conclusively, interventions can be effective on students with attention deficits as exhibited by the results of this research study.

In an effort to solidify the usefulness of school-based interventions/behavioral interventions, it is recommended that further studies be conducted in fourth grade inclusive mathematics classrooms. Moreover, to enhance educational outcomes, deliberate attempts at educational interventions are necessary, and it is most likely that those educational interventions and programs that work with other students are also effective for students with ADHD (Purdie, Hattie, & Carroll, 2002). In the future, this research could be extended to students who are not identified with Attention Deficit Hyperactivity Disorder.

A potential limitation of this study could be the small population of students that were included in the research. The research was based on interventions implemented with students from the fourth grade only. Another limitation could be the short amount of time provided for the interventions.

In conclusion, the exploration of what are effective instructional strategies for students with attention deficits revealed the following: (1) behavioral prompts such as hand signals promoted the targeted on-task behavior; (2) extrinsic rewards/visual cues

promoted the targeted on-task behavior; (3) peer mediation promoted the targeted on-task behavior; and (4) visual cues (visible directions) promoted the targeted on-task behavior. As proposed by the U.S. Department of Education (2008), there are various behavioral intervention techniques that have been demonstrated to be helpful for students with ADHD to increase on-task behaviors.

Implications for Practice

It is true that many experts propose that children with ADHD constitute 3 to 5 percent of the student population in the United States (Purdie, Hattie, & Carroll, 2002; Sharpes, 1999; Stevens, 1997). It is also true that most experts believe that it is primarily an inherited, neurobiological disorder (Gregg, 1995). Moreover, the specific causes of the inattention and hyperactivity-impulsivity that lead to a child's diagnosis are often not known (Heward, 2003). With all of this in mind, this research study has demonstrated the potential benefits of school-based behavioral interventions.

Teachers, regardless of the number of years of experience can learn new ways to deliver instruction to a diverse student population. With such tools as behavioral prompts, extrinsic rewards, peer mediation, and visual cues, teachers can be more effective in providing classroom environments that allow all students to be efficient learners. In addition, teachers may be guided to explore and develop other various behavioral interventions.

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Appendix A

		Baseline		
	Target Behavior	Day 1	Day 2	Day 3
Student A				
Student B				
Student C				
Student D				
Student E				
Student F				

Appendix B

		Intervention		
	Target Behavior	Day 1	Day 2	Day 3
Student A				
Student B				
Student C				
Student D				
Student E				
Student F				

Appendix C

		Removal of Intervention		
	Target Behavior	Day 1	Day 2	Day 3
Student A				
Student B				
Student C				
Student D				
Student E				
Student F				