

WHAT ARE THE EFFECTS OF TEACHING SELF-MONITORING ON INDEPENDENT TASK WORK COMPLETION
AND ACCURACY IN 6TH GRADERS WITH ADHD?

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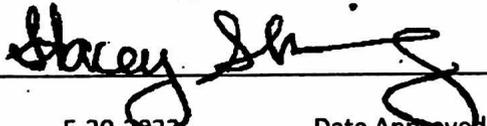
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Abstract

This research project analyzed the effects of teaching self-monitoring on independent task work completion and accuracy in sixth graders with ADHD. It took place in a special education setting. There were four participants in sixth grade that each had a diagnosis of ADHD. It utilized a multiple baseline design across participants with a three class period baseline, followed by a seven to ten class period intervention, and three-day maintenance phase for the participants. The students calculated the percentage of problems completed and the percentage of how accurately they were completed and plotted both percentages on their line graph. The students were taught to self-monitor their attention and focusing strategies. At the end of each class the participants would calculate the percentages for work completion and accuracy, and graph the results. The four participants all made gains in their work accuracy rate. All four participants had a high baseline for work completion. Two of those participants sustained their high work completion percentage during the entire study and two participants showed growth in work completion during the intervention phase. The results of this study indicate that the use of self-monitoring is an effective intervention for sixth grade students with ADHD.

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Chapter 1: Introduction

Students with Attention Deficit/Hyperactivity Disorder (ADHD) demonstrate behaviors that are a common challenge in the classroom for the student with the disorder as well as their peers and their teachers. This disorder makes it difficult for students to focus on the expected tasks and to manage their impulses (National Institute of Mental Health, 2016). Self-monitoring may help students with ADHD to identify when they have lost focus and help them take responsibility for shifting their attention back to the task.

Studying the effects of teaching self-monitoring to these students may provide teachers a strategy to help students with ADHD manage their own behavior. This is an important skill for students to learn so that they can manage their on-task behavior at school or at work. It is also beneficial that students with ADHD learn to self-monitor in order to be more independent and rely less on adult support to maintain focus.

Previous research in self-monitoring in both school and home environments have shown promising results. Self-monitoring was used in the home setting for on-task behavior while doing chores, homework, and following routines (Axelrod et al., 2009; Blichka & Belfiore, 2013; Slattery et al., 2016). It was used in the school setting for organization, academic performance, and on-task behavior (Bedesem, 2012; Briere & Simonsen, 2011; Bruhn et al., 2017; Gureasko-Moore et al., 2006; Harris et al., 2005; Shimabukuro et al., 1999; Vogelgesang et al., 2016). In most of the reviewed previous research, the findings were in favor of self-monitoring being an effective intervention. The previous research methods and results are outlined in the second chapter of this report. There needs to be expanded research with more students, to see if these studies can be replicated to further confirm this as an effective intervention. This study will extend the research into a special education setting to analyze the effects in an alternative environment for students with ADHD.

In this report, the following definitions of the terms, ADHD, self-monitoring and on-task behavior are used to ensure consistency. The researcher applies the definition of ADHD from the National Institute of Mental Health (2016) in order to be consistent with the diagnostic criteria used by doctors. They define ADHD as, “a brain disorder marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development” (Overview section, para. 1). Self-monitoring is defined by Slattery et al. (2016) as “observing and recording one’s own behavior” (p. 169). Briere and Simonsen (2011) define on-task behavior as “engaging in behaviors that are specified and desired by the teacher at that time” (p. 132).

The researcher attempted to answer the question of “What are the Effects of Teaching Self-Monitoring on Independent Task Work Completion and Accuracy in sixth graders with ADHD?” This study used a multiple baseline design with four participants to analyze whether self-monitoring was an effective intervention for students with ADHD. It was conducted in a special education classroom. The researcher collected baseline data of work completion and accuracy for each student prior to beginning the intervention. During the intervention phase the students were collecting and graphing their percentages for accuracy and work completion at the end of the class period. The methods and procedures used in this study are addressed in the third chapter of this report.

The results of this study indicate that self-monitoring was an effective intervention on independent work completion and accuracy. In the intervention phase and maintenance phase, all four participants had a positive trend-line for accuracy rate. When analyzing the graphs for work completion all of the participants had a high rate of work completion during the baseline phase of this study. Two of the participants were able to continue a 90-100% work completion rate during the entire study. The other two participants had a decrease in work completion when the intervention phase began and demonstrated growth throughout the intervention phase and were able to maintain a work completion of 85% or higher. For a more detailed description of the data, refer to chapter 4 of this report.

This study demonstrated that self-monitoring is an effective intervention for students with ADHD. The findings indicate that self-monitoring can be implemented within the classroom to help students with ADHD increase the accuracy of their independent work. The researcher was able to replicate the findings of some of the research outlined in the second chapter of this report. An in-depth discussion of the findings, implications for professionals, and the need for future research can be located in the fifth chapter of this report.

Chapter 2: Review of Literature

Attention Deficit/Hyperactivity Disorder (ADHD) is one of the most prevalent mental disorders diagnosed in children (Centers for Disease Control and Prevention, 2017). In the United States, parents reported that 9.4% of children ages 2-17 years-old are diagnosed with ADHD (Danielson et al., 2018). Thus, a typical classroom of 30 students will have 2-3 diagnosed students. According to the National Institute of Mental Health (2016), “ADHD is a brain disorder marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development” (Overview section, para. 1). This disorder can interfere with a child’s ability to learn in a typical classroom due to their inability to focus and manage their impulses. These difficulties can prevent students from accessing the general education curriculum and cause them to have difficulties throughout their schooling and potentially into their careers.

There are currently several treatment methods for ADHD including counseling, behavior therapy, and medication (Centers for Disease Control and Prevention, 2017). The purpose of this review was to investigate the effectiveness of teaching students to self-monitor their behavior and the impact of this strategy on the students’ academic performance. This review analyzed the methods researchers have used to teach students how to self-monitor their behavior, the research findings, and the need for continued research on this topic.

Self-Monitoring

Self-monitoring has been used as an intervention tool in school (Bedesem, 2012; Blicha & Belfiore, 2013; Briere & Simonsen, 2011; Bruhn et al., 2017; Harris et al., 2005; Shimabukuro et al., 1999; Vogelgesang et al., 2016) and home environments (Axelrod et al., 2009; Slattery et al., 2016). At school, self-monitoring has been used for tracking on-task behavior (Bedesem, 2012; Briere & Simonsen, 2011; Bruhn et al., 2017;), work completion (Harris et al., 2005; Shimabukuro et al., 1999), following the classroom expectations, (Vogelgesang et al., 2016), and organization (Blicha & Belfiore,

2013). In the home setting, Axelrod et al. (2009) studied self-monitoring in regards to homework completion and organization, while Slattery et al. (2016) studied self-monitoring of children following specific routines at home. All of the researchers concluded that self-monitoring was an effective intervention, and their studies will be addressed more thoroughly in the following sections.

Self-monitoring is a self-regulation skill that has been used as an intervention for students to support them in learning to acknowledge and change their own behavior (Sprick & Garrison, 2008). This skill can be used to help improve behavior in a variety of ways including organization, on-task behavior, work completion, and work accuracy. Bruhn et al. (2017), described self-monitoring as a process that “involves students thinking about their behavior, being aware of its occurrence and then recording the degree of occurrence” (p. 120). All of the reviewed studies defined self-monitoring similarly; some included that a target behavior is identified for the student to record if it occurred during designated intervals (Bedesem, 2012; Briere & Simonsen, 2011; Vogelgsang et al., 2016). A critical part of self-monitoring is to ensure the child stops and analyzes their behavior and records whether or not the targeted behavior occurred over a specific time period. This is essential so that the child can begin to modify their behavior. Sprick and Garrison (2008) note that self-monitoring is beneficial because “it teaches students to manage their own behavior, as opposed to having an adult do so” (p. 487). It is important for children with ADHD need to learn to manage and modify their own behavior to help them increase their independence in the classroom and for future careers.

Organizing Material

Researchers have studied techniques for teaching students to self-manage the organization of their school materials. These techniques have demonstrated effectiveness for the children in the reviewed studies (Blichka & Belfiore, 2013; Gureasko-Moore et al., 2006). Gureasko-Moore et al. (2006) studied the effects of teaching students to have all of their materials at the beginning of class. Blichka and Belfiore (2013) focused their study on having their materials at the end of the day. Both groups of

researchers used a multiple baseline design. Gureasko-Moore studied three seventh grade male students with ADHD and Blicha and Belifore studied one fifth grade boy with ADHD. By using this design method, both groups of researchers were able to show that the intervention was effective while minimizing the possibility that outside factors influenced the results.

A technique used by Gureasko-Moore et al. (2006) had the students use a checklist to determine if they had all required materials at the beginning of each class and met with the experimenter daily to review their progress. The three students had baseline data that ranged from 40 to 50% of the time having their required materials. During the intervention training phase all three boys increased to 67 to 75% of having their required materials. The boys were able to maintain their progress with having their materials 80 to 100% for the rest of the intervention and during the maintenance phase of this intervention. The use of a checklist was effective in this study to help with the organization of materials at the beginning of class.

Another technique with demonstrated effectiveness is the use of a vibrating watch with a checklist. During the intervention phase of this study, Blicha and Belfiore (2013) had the student use a vibrating watch and checklist and then removed them during the second baseline phase of the study. During the initial intervention phase, the student brought home the correct homework 100% of the time versus the initial baseline, which was an average of 54% of the time. When the intervention was removed, his accuracy average went down to 71%, then returned to 100% during the final intervention phase. After the study was conducted, the researcher did five follow-up checks at one month intervals, which showed that the intervention was continuing to be effective.

Time On-Task

Vogelsang et al. (2016) also found that teaching self-monitoring skills at school was beneficial for students with ADHD. In this mixed-methods study, they combined a single subject A-B-A-B design with a case study of the teacher's perceptions. The sample size was three students in fifth grade who

demonstrated frequent off-task behaviors and did not abide by the classroom expectations. The students all began with a baseline percentage of academic engagement (AE) between 21 to 43% of the time. During the initial intervention phase, in which they used an app to rate their behavior, all three students demonstrated 86 to 88% AE, and when the intervention was removed, they dropped to an average range of 41 to 48%. When the intervention was restored, rates increased back to 81 to 88% AE. This demonstrated that the intervention had a positive effect on the percentage of time a student was actively engaged and following the classroom expectations.

The research was extended on teaching self-monitoring by Bruhn et al. (2017), and Bedesem (2012) and both studies showed that it was effective for on-task behavior. Bedesem and Bruhn et al. demonstrated this using a multiple baseline design with a sample size of two and three middle school students respectively. Bedesem chose to have the students use a cell phone to send texts with the ratings of their behavior. This study showed an increase of on-task behavior from baseline to intervention phase for Participant A being 28% to 64% and Participant B increasing from 53% to 84% of the time. Bruhn et al. gave their participants an iPad with an app to use to score their behavior. In this study, the first participant showed a growth from 53% AE to 91% AE, the second participant 68% AE to 98% AE, the third participant increased on average from 32% to 60% AE. However, upon reviewing the data gathered, there was not a steady trend in the third participants' data that could be seen in the first two participants in this study and in the two participants' data from Bedesem's study.

Academic Performance

The effects of teaching self-monitoring on academic performance has been studied. Shimabukuro et al. (1999) conducted a multiple baseline design across math, reading, and writing for one sixth-grade and two seventh-grade boys with ADHD and learning disabilities. Similarly, Harris et al. (2005) conducted a study with a multiple baseline design with six children in third through fifth grade diagnosed with ADHD, but this study focused on academic performance in spelling.

In the study conducted by Shimabukuro et al. (1999) they focused the self-monitoring on both academic performance and accuracy and found that all three participants made growth in both their performance and accuracy. On average, all three participants started with a mean baseline below 45% and it increased to an average of 96% productivity. When analyzing the accuracy, the students started with a mean baseline of 52% and it increased to an average of 80%. Shimabukuro et al. concluded that this was an effective intervention to help increase both the accuracy and productivity of students with ADHD.

Harris et al. (2005) used their study to compare the effects of self-monitoring of attention vs. self-monitoring of performance in spelling and found both interventions to be effective at increasing their baseline scores in accuracy of spelling. The average baseline for the six students was 55% accuracy. When the intervention for self-monitoring of attention was implemented, the scores raised to 94% accuracy. During the next phase of intervention, they monitored themselves for accuracy and the average accuracy was 92%. Harris et al. (2005) concluded that self-monitoring of attention was more effective at increasing the student's spelling scores.

Function Based

In contrast with the previous studies, Briere and Simonsen (2011), focused their study on whether analyzing the function of the behavior and then designing the self-monitoring intervention around the function had different results. They did this by conducting a functional behavioral analysis and then using an alternating treatment design with one treatment being with a functionally non-relevant behavior and the other being a functionally relevant behavior.

This study had two participants in seventh grade who were diagnosed with ADHD (Briere & Simonsen, 2011). The first participant's behavior's function was to avoid instruction and had an average baseline percentage of off-task behavior of 52.1% (Range= 45.6-53.3%). When using a functionally non-relevant self-monitoring sheet his average percentage of off-task behavior dropped to

a 49.2, in contrast to the functionally relevant self-monitoring sheet his average percentage of off-task behavior dropped to 29.7%. This cycle was repeated with similar results for the second round of interventions with a percentage of off-task behavior for the functionally non-relevant increasing back to 52.6% and decreasing to 24.4% when the functionally relevant intervention was reintroduced. The second participant in this study showed a similar trend (Briere & Simonsen, 2011). The function of the second participant's behavior was identified as seeking peer attention. The baseline levels of off-task behavior were an average of 49.2%. First this participant was given a functionally relevant self-monitoring sheet and their off-task behavior dropped to an average of 35% which increased with the non-relevant intervention to 49.2%.

The second cycle of the interventions showed a similar trend with the relevant self-monitoring sheet leading to an average off-task behavior of 10.7% and then raising to an off-task average of 53.1% with the non-relevant sheet. This study demonstrates the value in taking the time to analyze the function of the behavior before beginning an intervention and then modifying the intervention for each child's specific needs.

Self-Monitoring at Home

Of the studies reviewed, two were implemented in the participants' homes and looked at the on-task behavior during a specific routine. Axelrod et al. (2009) used an alternate treatment design with five participants in a residential environment. They studied the effects of implementing a self-monitoring strategy for on-task behavior during homework time and compared the results of using a 3-minute interval versus a 10-minute interval. Slattery et al. (2016) wanted to extend the research done by Axelrod et al. by using a multiple baseline study for the on-task behavior during a specific routine at home for three participants.

In studies conducted using two different interval lengths. Axelrod et al. (2009) and Slattery et al. (2016) both found that there was no significant difference. The participants' baselines in Axelrod's

study averaged from 42.5-60% time on-task and rose to averages between 85-90% time on-task regardless of whether they were monitoring their behavior every three or every ten minutes. In the study by Slatterly et al., her participants' baselines started with averages ranging from 22-26% time on-task and rose to averages ranging from 86.3-99.7% with the 3- minute interval. When these participants' interventions faded to the 8-minute interval two of them continued with a high time on-task average percentage of 97.5-99.9%, while the third participant dropped to an average time on-task of 65.3%. The first two participants confirmed the findings of Axelrod. Slatterly et al. hypothesized in the discussion that the third participant was focused on the reward for being accurate in his self-monitoring and was only focused on being on-task when the timer went off instead of focusing on improving his overall percentage of time on-task.

In contrast, Christiansen et al. (2014) did a two-group pre-test and post-test design study to decrease the symptoms of ADHD. They were comparing self- monitoring therapy sessions to Neurofeedback therapy. The sample size in this study was 58 children diagnosed with ADHD. Christensen et al. used the Conners-3 rating scale as the pre-test, post-test to the child's parents and their teacher. In reviewing the data from this study, the self-monitoring groups score from pre-test to post-test dropped a mean score of 13.13 to 7.00 ($p < 0.001$). This data shows a decrease in problematic ADHD symptoms at home over the six-month period. The teacher ratings showed a similar decrease from pre-test to post-test scores of 10.06 to 6.69 ($p = 0.001$). These comparisons demonstrate that the skills taught in the self-monitoring therapy sessions were able to be generalized at home and at school. This is the first study reviewed to demonstrate that self-monitoring skills can be generalized across environments and it also showed that the effects lasted at least six months. A follow up study of these participants would be beneficial to see if the effects of this therapy continue after the therapy has ended.

Conclusion

This review sought to examine the effects of teaching self-monitoring to students with ADHD. Based on the studies reviewed it can be concluded that teaching of self-monitoring skills may be an effective strategy to modify the behavior of students with ADHD both at home and at school. This intervention will be a useful strategy for teachers to use when a student is displaying problematic behaviors at school. However, parents can also implement this intervention at home to help their child with ADHD monitor their own behavior to stay on-task while doing chores and following routines. In all of the previously mentioned studies there were very few participants and further research would be beneficial to see if these results can be generalized. Further research is also needed to see if similar results of teaching self-monitoring skills can be found in other areas as well as analyzing the ability for these skills to be generalized across settings. To see if these results could be replicated, further research was conducted to address the research question what are the effects of teaching self-monitoring on independent task work completion and accuracy in sixth graders with ADHD? This research will help to give teachers a strategic intervention to implement when problem behaviors are observed due to a child's ADHD.

Chapter 3: Methods

Students with Attention Deficit/Hyperactivity Disorder (ADHD) need to learn strategies to focus their attention on independent work for school as well as for future careers. By teaching these students to self-monitor their attention, they should be able to complete their independent class work. This study examined the research question, “What are the Effects of Teaching Self-Monitoring on Independent Task Work Completion and Accuracy in Sixth Graders with Attention-Deficit/Hyperactivity Disorder?”.

Setting

This study took place in a suburban intermediate school located in the Upper Midwest. This school serves approximately 920 students in fifth and sixth grade where approximately 10% of the students receive special education services. This school provides most of the special education services in inclusive settings including both general and special education students but also offers small group intervention classes led by a special education teacher. This study took place in a small group math intervention class run by the special education teacher conducting this study. This class was held every other day and was 40 minutes long. The structure of this class included a 15-minute lesson reteaching the material that the students learned in their regular education math class followed by 25 minutes of independent work time.

Participants

This study involved four participants who were diagnosed with ADHD by a medical professional. All of the participants were white, 11-years old, and in sixth grade. All of the students received special education services due to ADHD. The participants were selected due to their inattention during math intervention class. Each participant was recruited by asking their parents via email and then after parents gave consent the participants were then asked to provide assent. Sample consent and assent forms can be found in Appendix A and B.

Experimental Design and Procedure

This study utilized a multiple baseline across participants design. This design follows the progress of individuals over time. The goal of this design according to Leedy and Omrod (2016) is “to show the effect of a treatment by initiating it at different times for different individuals” (p.199). This design allowed the researcher to examine the effectiveness of self-monitoring for work completion and accuracy on the students’ work during math intervention by starting the intervention at different times for different participants. The intervention started with the first participant and after one class period the next participant started the intervention phase to reduce the possibility that an outside factor might impact the scores. This pattern continued until all participants began the intervention phase. By staggering participants’ start dates any change could be concluded as an impact of the intervention rather than an outside factor such as a change in the educational environment or content.

Baseline

The researcher collected baseline data of percentage of problems completed and percentage of problems correct for three class periods for each participant. One participant started the intervention one class period before the next participant. The researcher analyzed the percentage of problems completed during each class period as well as the percentage of problems that were correct. This data was also plotted on a line graph for interpretation.

Training

Each participant was individually introduced to the procedure during one 20-minute session with the researcher. The researcher discussed with the participant what it feels like to pay attention and how to refocus when they notice their attention is wandering. This also included introducing a visual that was taped onto their desks with the specific strategies that they were taught to help them focus. In these sessions, the researcher also discussed the importance of self-monitoring their independent work completion in both accuracy and percentage of work completed during their math

intervention class and guided the participants to set goals for themselves to beat. The researcher also taught the participants how to calculate the percentage of problems they completed, the accuracy of their work, and how to record and graph the data on their individual self-monitoring sheets. The script for this training can be found in Appendix C and the visual introduced is included in Appendix D. The script and visual are based on strategies outlined in the books: *Scattered to Focused* (Grisham, 2021), *ADD/ADHD Behavior-Change Resource Kit* (Flick, 1998), *Learning to Slow Down and Pay Attention: A book for Kids About ADHD* (Nadeau & Dixon 1997), and *Empower ADHD Kids: Practical Strategies to Assist ADHD Children in Developing Learning and Social Competencies* (White, 2005).

Intervention

The researcher taught the students their math lesson for the first 15 minutes of math intervention followed by a 20-minute independent work time. The final 5 minutes of class were used for the students to correct their work as well as graph their accuracy and work completion. The intervention was conducted every other day for 4 weeks followed by a 3-day maintenance phase to see if the students maintained their productivity and accuracy after the intervention had ended.

Data analysis.

The data was plotted onto line graphs and a trend line was examined to determine if the intervention appeared to have been effective. By using a graph to analyze the data the researcher was able to draw conclusions based on the patterns in the data set (Leedy & Ormrod, 2016). A trend line demonstrating a higher percentage of accuracy and percentage of work completion would indicate the intervention was effective.

Chapter 4: Results

Attention Deficit Hyperactivity Disorder is a brain disorder that leads to students to struggle to maintain focus on their work. This research sought to implement a self-monitoring intervention and analyze the effects of the accuracy and work completion for four sixth grade students with ADHD.

This research was completed using a multiple baseline approach and was conducted in a special education setting. The researcher collected baseline data of work completion and accuracy for each student prior to beginning the intervention. During the intervention phase the students were collecting and graphing their percentage for accuracy and completion at the end of the class period. The goal for the participants was to have 80% or better in accuracy and work completion. In this chapter the researcher will go in depth about the findings of this research for each of the four participants.

Student A

The first participant of this study was Student A and their results are displayed below (Figures 1 and 2). During the baseline phase of this research this participant always completed the assignment and had a work completion average of 100%. Their accuracy however had an average of 62%. The baseline phase for this participant lasted for three class periods. During that time their highest accuracy was 75% and their lowest was 50%.

Figure 1

Student A – Work Completion

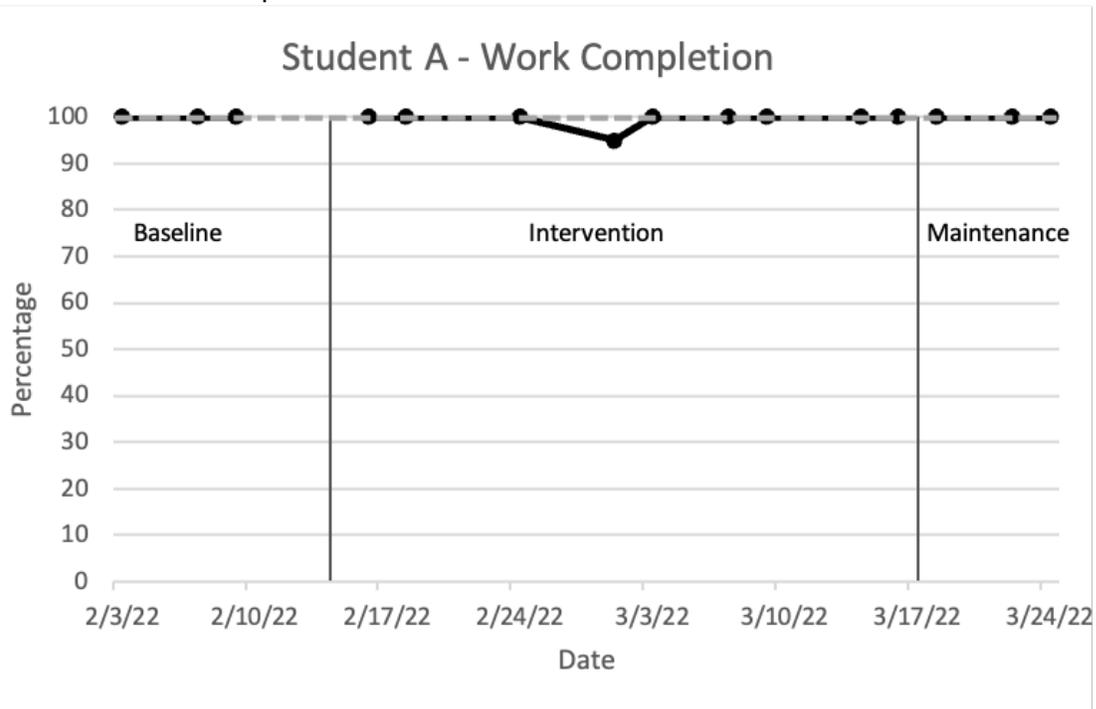
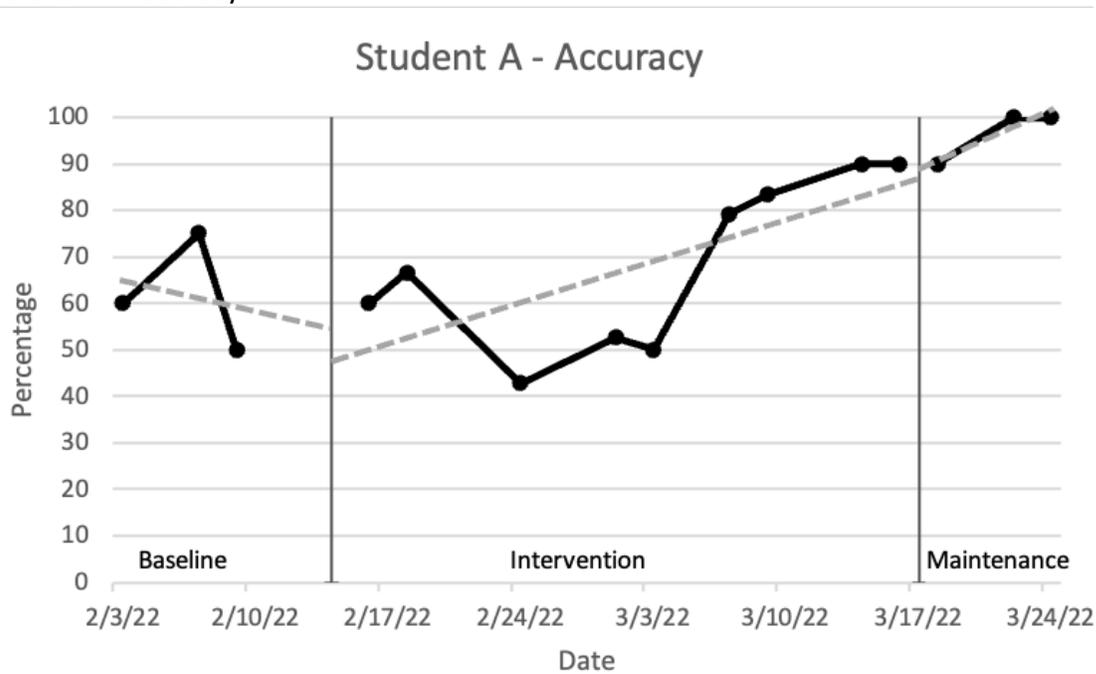


Figure 2

Student A – Accuracy



During the Intervention phase, Student A had an average work completion of 99% and their average accuracy was 68%. They were able to consistently have 100% work completion for all of the sessions except one, which was 95%. The first five sessions of the intervention phase for Student A had an average accuracy of 54% and then during the last four sessions they were able to increase their average accuracy to 85%. On figure 2, it can be observed that the trendline for accuracy has a positive slope indicating that the student's accuracy is increasing.

The final phase of the research was the maintenance phase, which lasted for three sessions. Student A was able to consistently have an average of 100% for work completion and an average of 95% for accuracy. Based on a visual analysis of Student A's data, it could be concluded that the self-monitoring intervention had a positive impact on the student's work accuracy.

Student B

The second participant, Student B, had a baseline average of 100% for work completion and 75% for accuracy. During the intervention phase this student's scores fluctuated, however, they still averaged at 95% for both work completion and accuracy (Figures 3 and 4). The final three sessions were the maintenance phase and Student B had 100% accuracy for both work completion and accuracy. Based on a visual analysis of Student B's data, it could be concluded that self-monitoring had a positive influence on student B as well.

Figure 3

Student B – Work Completion

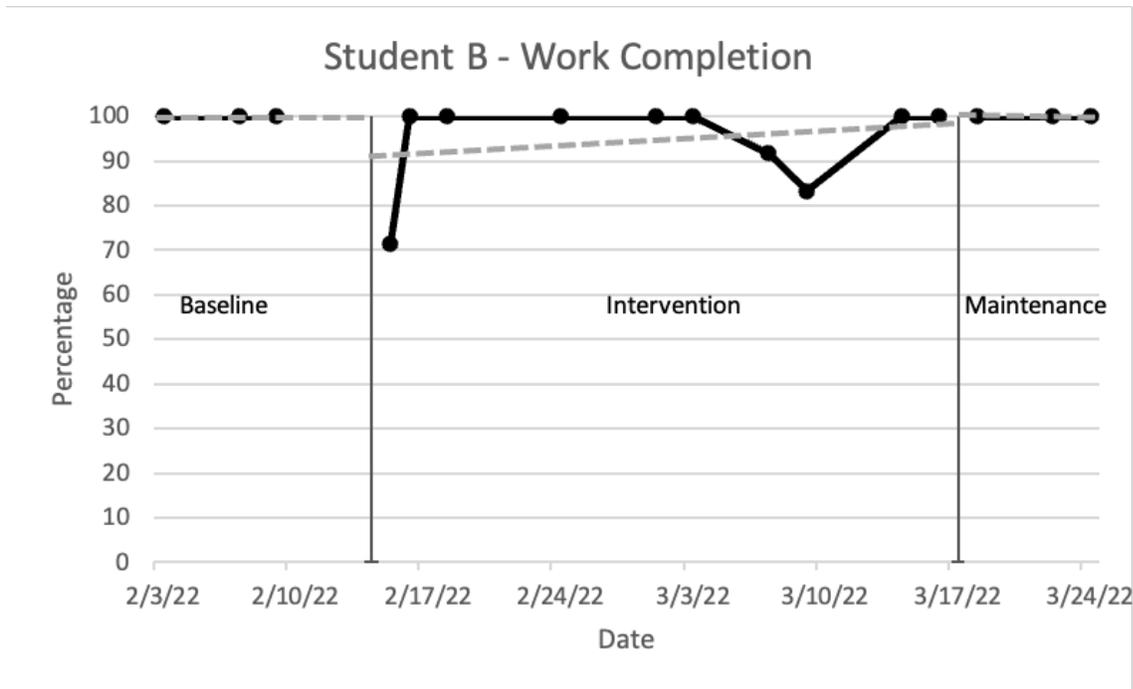
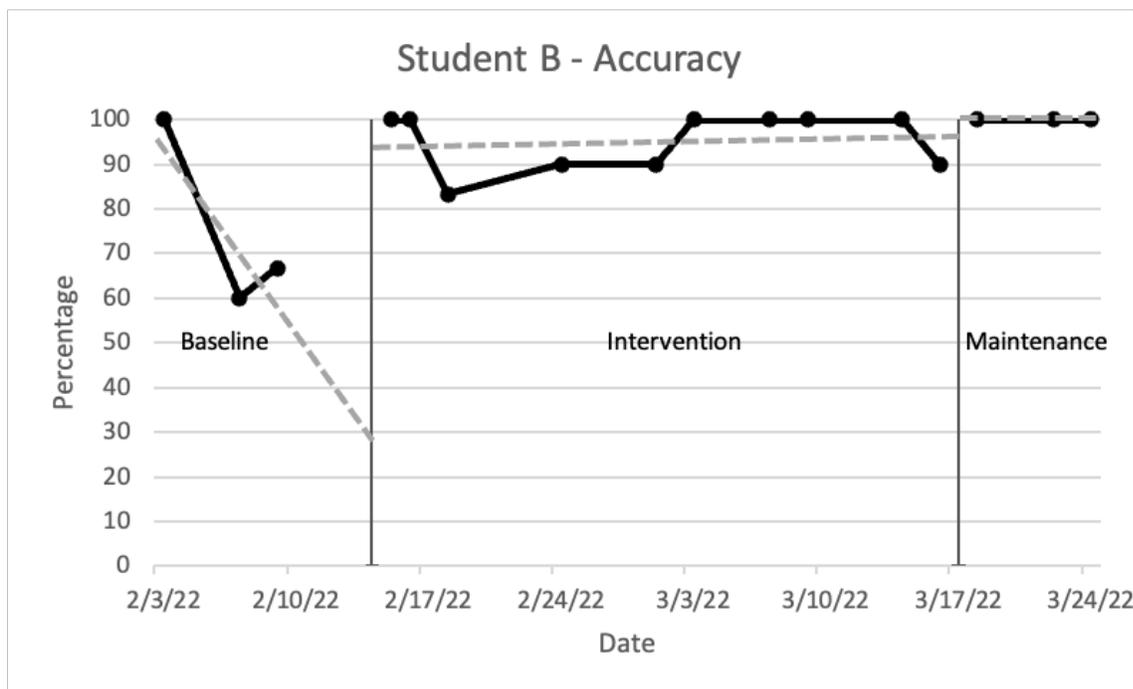


Figure 4

Student B – Accuracy



Student C

The Student C had a baseline average accuracy of 72% and 100% for work completion. Looking at the graphs (Figures 5 and 6) during the intervention phase, this student started at the same score as their lowest baseline score. After that the student starts making improvements on their accuracy and by the end of the intervention phase the student has 100% for both accuracy and work completion. During the final phase the student maintained a 100% for work completion and raised their accuracy up to an average of 97%. Analyzing the trendline would indicate that the intervention may have influenced the student to make improvements on their accuracy.

Figure 5

Student C – Work Completion

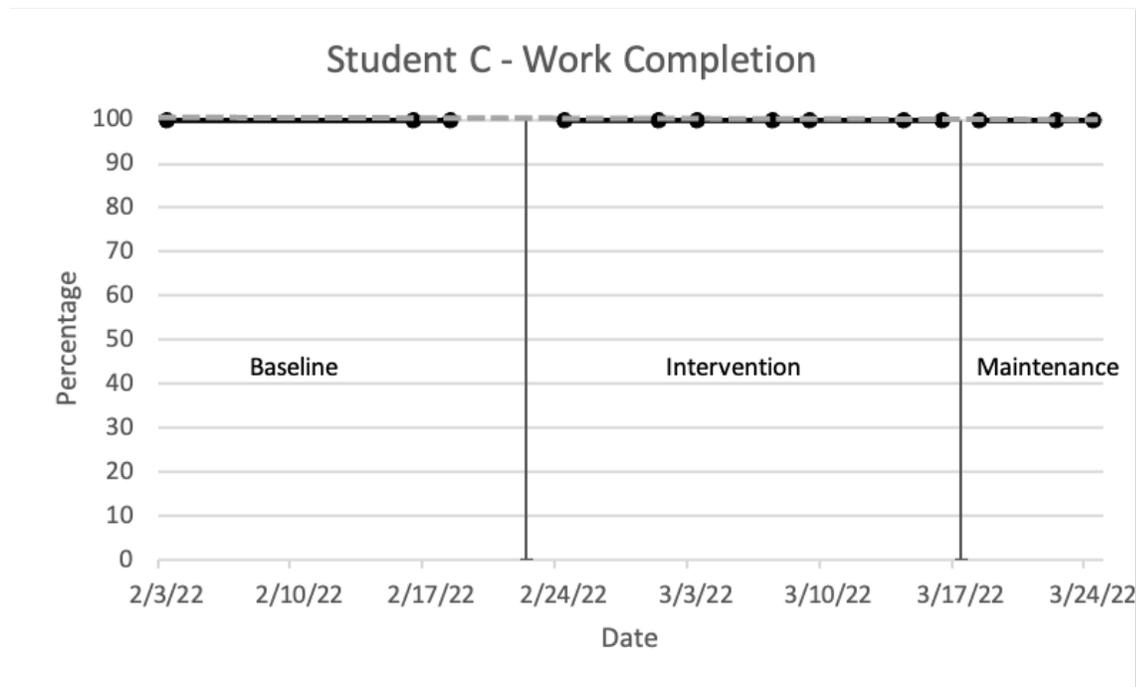
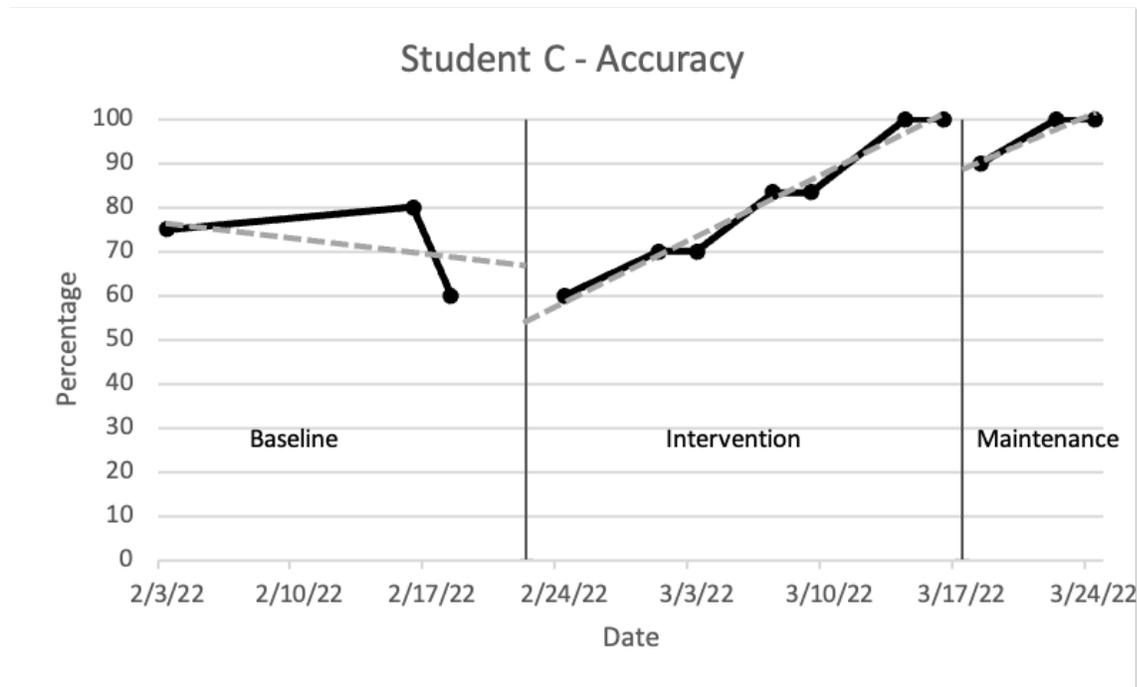


Figure 6

Student C – Accuracy

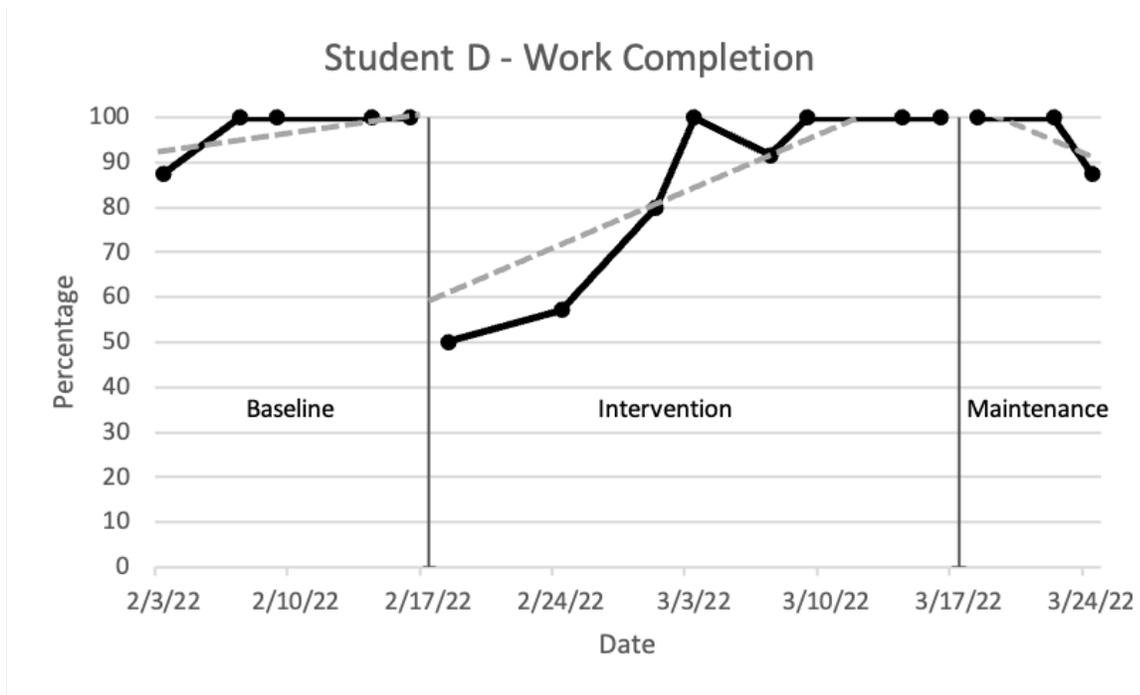


Student D

The final participant, Student D, had an average baseline of 76% accuracy and 97% completion. Overall, this student had a very high baseline; on the graphs (Figures 7 and 8) it can be noticed that they only had one accuracy score beneath 85% and the rest of the scores were above 85%. During the intervention phase, Student D had an average of 84% for assignment completion and 92% for accuracy. The maintenance phase for this student was an average of 96% for work completion and 93% for accuracy. Overall, the trend line demonstrates that this intervention may have had a positive impact on this student for work completion and accuracy.

Figure 7

Student D – Work Completion



Conclusion

After reviewing the data and trendlines, it appears that all four students made improvements on the accuracy of their work and the intervention was effective for these students. These results correlate with the results found during the review of literature as outlined in chapter 2. Overall, the four students did not change their work completion percentage from baseline to maintenance phase. Students B and D did show some growth during the intervention phase, however, at the beginning of the intervention phase both of their percentages dropped to below their baseline averages. For a more in-depth discussion of these results continue to chapter 5.

Chapter 5: Discussion

This study sought to analyze whether self-monitoring would increase the work completion and accuracy of sixth grade students with Attention-Deficit/Hyperactivity Disorder. This study had four participants and used a multiple baseline design. The students were taught to monitor their attention and review their work. They were also taught how to record their percentage of work completion and accuracy rate. The researcher noticed that the participants were engaged with this intervention. The students expressed their pride when beating their previous scores.

All four of the participants in this study showed an increased accuracy on their independent work. These findings are consistent with past studies, suggesting that self-monitoring is an effective intervention for students with ADHD. This study confirms the findings of Shimabukuro et al. (1999) and Harris et al. (2005) who also found their participants increased their accuracy rate with self-monitoring. This study was also able to replicate the findings of Harris et al. (2005) that participants can make growth with self-monitoring without an extrinsic reward. The current study extended the research of Shimabukuro et al. (1999) and Harris et al. (2005) by conducting the study in the special education classroom. This study also combined work completion and accuracy rate at the same time like Shimabukuro's study.

Unlike the findings of Shimabukuro et al. (1999) and Harris et al. (2005), the four participants in this study all had a high baseline for work completion. This was due to the participants rushing through their work on a daily basis. During the intervention phase, Student B and Student D's work completion dropped before making progress. This could be caused due to them taking more time to get the problems correct after the intervention was implemented or because they were practicing new strategies to help them stay focused.

Strengths

The current study has several strengths. The first strength of this study was that it used a multiple baseline design, which is beneficial to show the effects of an intervention or treatment when it is a skill that is learned and cannot be reversed (Leedy & Omrod, 2016). This design was also a strength due to having the participants start the intervention at different times. It increased the likelihood that changes in a students' work completion or accuracy rates were a result of the intervention. It also decreased the probability of an outside factor influencing the students' performance on their independent work.

An additional strength of this study was that it analyzed both work completion and accuracy rate. This was a strength to ensure that the data was not skewed by participants getting a high accuracy rate due to only completing a portion of the assignment. For example, if the only data point was looking at accuracy rate the student could get a 100% accuracy rate by just completing one out of ten problems. This study was able to address this by looking at both work completion and accuracy rate. By addressing both this also makes the findings readily applicable to the field.

Another strength of this study was that it was simple to implement and did not consume a lot of instructional time. This is a strength due to it being more likely to be used in the future by both professionals and families. This study also extended existing research into a special education classroom as well as demonstrating effectiveness even though it was only implemented every other day. All of these strengths made this an effective study that could easily be replicated and used to improve the behaviors of students with ADHD.

Limitations

There are some limitations of this study that need to be acknowledged. The first limitation was that there was a small sample size. This study only consisted of four participants and a larger sample size would offer a more accurate representation of students with ADHD and the effectiveness of the

intervention. This is similar to the studies done by Shimabukuro et al. (1999) and Harris et al. (2005), who used 3 and 6 participants respectively. A larger sample size would also allow for more generalizations of the effectiveness across grade levels, environments, and age-levels of the participants.

Another limitation was that the length of the assignments varied from day to day due to the complexity of the math problems and it was difficult to determine whether it had an impact on the high work completion percentages. The length of the assignments ranged from four to ten problems depending on the topic. This study also expanded across two different math topics which may have impacted their accuracy rate due to the topics being more difficult or new to the participants.

The third limitation for this study was that it had a short maintenance phase, which does not allow insight onto whether this intervention influences students' behavior long term. It would be interesting to investigate the accuracy rates and work completion rates of the participants over a longer maintenance phase to see if this intervention is effective over longer periods of time.

Implications

The current study provided data to suggest that self-monitoring is an effective intervention for students with ADHD. The implications this study has for professionals are providing a school-based intervention that teachers could start implementing to decrease the challenging behaviors as well as increase academic success for their students with ADHD. Setting goals was important for the participants to help increase engagement. Learning how to monitor their attention and evaluate their progress was also important for them to practice executive functioning skills that they can bring with them into other classes or careers. This study demonstrated an effectiveness in increasing the accuracy rate of students.

Further research should focus on replicating this study in other environments such as within a general education setting to further demonstrate the benefits of self-monitoring within the classroom. It

could also be extended into having students self-monitor their behavior in unstructured school settings such as lunch, recess, hallways or bus. Although the findings of this study suggest that this is an effective intervention it should be replicated with larger sample sizes and varying age groups to further generalize the effectiveness of self-monitoring for students with ADHD. Replicating this study over a longer period of time or implementing a longer maintenance phase would also illuminate the long-term effects of self-monitoring on students' behavior.

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Appendix A: Consent Form



**What are the effects of teaching self-monitoring on independent task work completion and accuracy in 6th graders with ADHD?
Consent to Participate in Research**

Purpose of the research: Elizabeth Heck from the Department of Special Education is conducting a research project on self-monitoring. By conducting this research, we hope to learn whether or not self-monitoring is an effective intervention for students with attention difficulties. You are being asked to participate because of your child's inattention difficulties. This consent form contains important information about this project and what to expect if you decide to participate. Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate.

Procedures: Your child will be asked to self-monitor their attention based on their work completion and accuracy during math intervention for the 6 weeks and the data will then be used in my research project. All of the students in the math intervention class will be self-monitoring their attention regardless of participation in the study.

Time Involvement: Your child's participation will take approximately 15 sessions of 40 minutes each over the course of 6 weeks. This will be during their math intervention class and will be required of all students in the class.

Risks & Benefits: The risks associated with this study are potential embarrassment or a negative impact on your child's self-confidence. The benefits to participation include learning to manage their work time better to complete their work without an adult prompting them. They may also learn about goal setting and how to generalize it into other settings. The findings from this project will provide information on whether or not self-monitoring is an effective intervention for students with attention difficulties.

Privacy & Confidentiality of your Information: The results of this research study may be presented at scientific or professional meetings or published in scientific journals. Your individual privacy will be maintained in all published and written data resulting from the study. Data collected will include accuracy and work completion percentages under a pseudonym.

Payment: You will not receive payment for participation in the study.

Right to Withdraw from the Research: Your participation in this research is completely voluntary. You have the right to choose not to participate or to withdraw your participation at any time without loss of any service, benefits, or rights you would normally be entitled to.

Questions about Research Study:

The person in charge of this study Elizabeth Heck of the University of Wisconsin Oshkosh, Department of Special Education. If you have questions, suggestions, or concerns regarding this study or you want to withdraw from the study please use the following contact information: 920 662-7671 or email at elizabethheck@ssed.schools.org. You may also contact my research advisor, Stacy Skomings of the University of Wisconsin Oshkosh, at 920 424-1727 or email at skomings@uwosh.edu.

Independent Contact for Reporting Concerns about Research:

If you have any questions, suggestions or concerns about your rights as a volunteer in this research, contact staff in the University of Wisconsin Oshkosh Institutional Review Board Office (IRB) at 920-424-3215 or IRB@uwosh.edu.

Consent:

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 phone: (920) 424-6215 | www.uwosh.edu/officeof-sponsored-programs

Appendix A: Consent – Continued



Your participation in this research is voluntary. Your signature or an email response of "I agree" or "I give permission" indicates that you have read this form and that all questions have been answered to your satisfaction. By responding "I agree" to this email, you are not waiving any of your legal rights as a research participant.

Parent or Legal Guardian Signature: I agree to allow my child to participate in this research.

Print Name of Child

Print Name of Parent/Legal Guardian

Signature of Parent/Legal Guardian

Date

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Appendix B: Assent Form



What are the effects of teaching self-monitoring on independent task work completion and accuracy in 6th graders with ADHD?

Child Assent to Participate in Research

You are being asked to join a research study by Elizabeth Heck, from the Department of Special and Family Childhood Education. This project is to learn whether or not self-monitoring is an effective strategy for children ages 11-12.

During math intervention you will be asked to self-monitor your attention based on your work completion and how accurately you complete the work. At the end of class, you will grade your own work and graph the results of the percentage of work you were able to complete and how accurately you completed your work. You will also be expected to set a goal on how to improve for next class. This project will take approximately 6 weeks to complete. By agreeing to participate in this project you will be allowing me to use the data that you gather during the 6 weeks.

If you join, there may be some risks, potential embarrassment or a negative impact on your self-confidence. There may also be some benefits such as, learning to manage your work time better to complete work without an adult prompting you or telling you to keep working. You may also learn about goal setting and how to use these skills in other classes as well. This project may also help identify if this is a useful strategy to use with other students your age.

If you do not want to join the project, you will participate in math intervention class like normal and fill out your self-monitoring forms but no data will be collected for the project.

Any information about you will be kept secure by the researchers by using the pseudonym that you have selected and there will not be any other identifiable data collected.

We will provide information to your parents before you decide to join or not join this study. We will also ask your parents for permission for you to be in this study.

If you have any questions at any time, please contact Elizabeth Heck at 920-662-7871 or email at elizabeth@hsoschools.org. You may also contact my research advisor, Stacey Skonings of the University of Wisconsin Oshkosh, at 920-424-1777 or email at skonings@uwosh.edu. If you would like to talk to someone else, you can call the IRB Office at (920) 424-3215 or email at IRB@uwosh.edu.

You do not have to be in this study. If you do choose to be in the study, you can change your mind at any time by contacting the researcher.

Signing this form means you have read this form and all of your questions have been answered. You and your parents will be given a copy of this form.

I agree to join this study.

Name of Child Participant

Signature of Child Participant

Date

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Appendix C: Script

Teacher: "I have noticed that you have been struggling to stay focused during math intervention and are struggling to get your work done. Today, we are going to work on some strategies to help you stay focused on your math work. Is that okay?"

Student responds

Teacher: "First I want to talk to you about what things distract you from your work so that I can help you remove those barriers and get you strategies to cope with them. What sort of things distract you?"

Student responds

Teacher: "I want you to complete this worksheet (*Test 1*) and I am going to time you on how long it takes you to complete. (*Read directions to the student*) Your job is to write the answers on the lines. Do you have any questions?"

Student responds

Teacher: (*Give the student Test 1 and start the timer. While the student works make noise, sing loudly, tap pencil and try to distract the student. When the student finishes the three questions or the timer gets to 3 minutes, stop the timer.*) "How did you feel when I was trying to distract you? Was it harder to get your work done? What strategies did you use to help you focus on the task? Student responds

Teacher: "Now I want you to complete this worksheet" (*Test 2*) *Give the student test B and start the timer. While the student works be silent and make sure not to distract the student. When the student*

finishes the three questions or the timer gets to 3 minutes, stop the timer. "Was it easier to stay focused on the second test?"

Student responds

Teacher: "Now your first strategy is to remove distractions from your environment. Pay attention to what things are distracting you and see what you can do to get rid of them. This could be moving to another location, turning your body away from a distraction or even putting on headphones. Which tools do you have that can help you remove distractions?"

Student responds

Teacher: "I am going to time you while you count how many A's there are on this worksheet. Do you have any questions?"

Student responds

Teacher: *Give the student worksheet C and start the timer. When the student finishes stop the timer and record the time. "Great job, now I want you to count the F's but as you count each one I want you to draw a line through it with a highlighter. Start the timer. When the student finishes stop the timer and record the time. "Great! Another strategy you can use is to use color you could highlight the important information in a problem or the addition and subtraction symbol in each problem." The last strategy I want to teach you is to cover the problems you aren't working on. You may have used this strategy for reading before. I want you to count the R's using this strategy and we will compare and see what strategies helped you the most. Start the timer. When the student finishes stop the timer and record the time. "Great job! What strategies do you think helped you the most?*

Student responds

Teacher: "Now we are going to practice using these strategies on a math worksheet. First I want you to highlight all the addition problems." *Give student Worksheet D and a highlighter.* "Now use this blank paper to cover up all the problems you aren't working on and move it as you go along.

Demonstrate covering up the problems with the blank sheet of paper. "Okay, now keep your eyes on the paper and take a deep breath if you feel yourself getting distracted. Okay, you may begin." *When the student finishes ask them, "What tools did you find helpful?"*

Student responds

Teacher: "Here is a visual I made you with the strategies we talked about today. *Read through the visual and ask, "Do you have any other strategies we could add on here to help you stay focused?"*

Student responds

Teacher: "Now I want to teach you how to keep track of your work completion. Here is your work so far." *Pull out a few of their work samples from the baseline data.* Today we are going to calculate the percentage of problems you finished as well as the accuracy or how many you got right. Here is a score sheet we will fill out after every assignment. First, we have to count how many total problems there were on the worksheet and write it in this box. *Point to correct box.*

Student responds

Teacher: "Next, we need to count how many you completed or got done?" Student responds

Teacher: "Perfect, write that number in this box." *Point to the correct box.* "Finally, we will count how many problems you got correct."

Student responds

Teacher: "Next, we need to count how many you completed or got done?" Student responds

Teacher: "Perfect, write that number in this box." *Point to the correct box.* "Finally, we will count how many problems you got correct."

Student responds

Teacher: "Great, write that number in this box." *Point to the correct box.* "Now to figure out your completion percentage we need to divide problems completed by total problems."

Student completes task on calculator

Teacher: "Good, now multiply that number by 100 to get a percent and write it in this box." *Point to the correct box.* "Next we will find the accuracy percentage by dividing how many problems you got correct by the problems completed."

Student completes task on calculator

Teacher: "Great, now multiply that number by 100 to get a percent and write it in this box." *Point to the correct box.* "The final step is to reflect on how well you focused on the task today. Were you on-task or off-task?"

Student responds

Teacher: "Every day at the end of class I am going to have you correct your work and fill out this sheet to calculate your completion and accuracy percentages. Then I am going to have you graph them to see how much progress you are making. To graph your percentages here is your graph paper. *Hand student graph paper.* First you will write the date on the line on the X-Axis then you will put a dot for your accuracy percentage in one color and a dot for your completion percentage in another color."

Student completes graphing task for the two numbers. *With teacher assistance as needed*

Appendix D: Visual:

- Remove distractions (move away from distractions, listen to music)
- Look at my work
- Take a few deep breaths to refocus
- Use color (highlight the important parts)
- Cover some of the problems