Effects of a Self-Monitoring Strategy on Independent Work Behavior of Students with Mild Intellectual Disability

Jennifer Coughlin, Kathleen M. McCoy, Amy Kenzer, Sarup R. Mathur, and Stanley H. Zucker
Arizona State University

Abstract: This study evaluated the effectiveness of a self-monitoring strategy on independent work behavior. The three subjects were in first grade, seven years old, identified with mild intellectual disability (MID), and had an Individualized Education Plan (IEP) with targeted functional academic and behavior goals. The purpose of this study was to investigate the effect of a self-monitoring strategy on on-task independent work behavior and task completion. A multiple baseline across subjects design was used. Data were collected using a frequency count of off-task behavior. The self-monitoring strategy was found to be successful with all subjects in the study. Overall, the subjects demonstrated a decrease in off-task behavior during independent work time after the intervention was introduced. Implications are discussed.

Off-task behavior can negatively impact the success of people with disabilities in various settings, including work, school, and other areas of community involvement. In one observation of a work program site, participants with disabilities spent 70% of observed time engaging in off-task behavior (Parsons, Rollyson, & Reid, 2004). Remaining on-task during independent work time at school is a struggle for many students. Staying on-task can be even more difficult for students with disabilities. Students with disabilities can be distracted by other stimuli in the environment or frustrated by the level of difficulty of the task they are expected to complete independently resulting in off-task behavior during independent work time.

Behaviors that are irrelevant to the current academic task are considered off-task, taking such forms as distracting other students, attempting to gain the attention of instructors, sitting idly, leaving the designated work space, engaging in self-stimulatory behavior, or engaging in destructive behavior (Gickling & Armstrong, 1978). When many students with disabilities are prompted to return to the academic task, often an increase in off-task behaviors is observed (Saunders, McEntee, & Saunders, 2005).

Two contributing factors related to off-task behavior during independent work time are difficulty of material and level of details in instruction. Independent work that includes 90% known material enhances the duration of on-task behavior (Burns & Dean, 2005). Students, who are given general instructions, rather than specific instructions, are more likely to engage in off-task behavior. Giving specific and descriptive instructions to a student increases the frequency of task completion (Bouxsein, Tiger, & Fisher, 2008).

Students with intellectual disability (ID) struggle to understand and identify the functions of their behavior (Crawley, Lynch, & Vannest, 2006). As a result of cognitive disability, students with ID typically experience interference with the ability to self-manage. Students with ID or other cognitive disability also can benefit from instruction which teaches specific self-management strategies to increase on-task behavior. Lack of self-management skills inhibits students with ID from appropriate independent functioning and integration into the community (Szelnick & Savage, 2000). Hume and Odom define independent functioning as “on-task engagement in an ac-
tivity in the absence of adult prompting” (2007, p. 1166). Conversely, learning to self-manage behavior can effectively enhance independent functioning in the home, school and community. Classroom goals for students that include working independently, self-managing behaviors, and finding motivation in natural consequences are important (Hume & Odom, 2007).

Remaining on-task during independent work time is a critical component of student success in the classroom. Students who demonstrate on-task behavior during independent work time may also be able to generalize this skill to other academic areas. To maintain high standards for all students, including students with ID and other disabilities, all students would benefit from instruction which facilitates their ability to engage in on-task behaviors during independent work time. When learners are independently engaged in on task behaviors, more instructional time is freed for the teacher as well. While students work independently on-task, teachers have opportunity to work one-on-one with a student, assess a student, or pull a small group of students for more intense instruction.

**Self-Monitoring**

A self-monitoring strategy that successfully increases on-task behavior during independent work time would benefit the individual students, teacher, and entire classroom.

Classroom goals for students that include working independently, self-managing behaviors, and finding motivation in natural consequences are important (Hume & Odom, 2007). In the classroom, when a student self-manages, the teacher is able to spend more time focusing on instruction. According to Koegel, Harrower, and Koegel (1999), one way to increase independent work is to teach students self-management strategies. Mitchem and Young (2001) created a class-wide peer-assisted self-management program in a classroom setting. They found that after training the students were able to self-manage. Teacher and students found the program valuable in improving classroom climate, and the program was successfully generalized to other classrooms.

Self-control and self-management interventions have many benefits. Self-management strategies are effective beyond the classroom setting in teaching daily living skills (Hume & Odom, 2007). Society values independent actions. Students who self-manage are more likely to behave independently and appropriately without adult supervision. Finally, self-management encourages more natural behavior changes than relying on external influences (Lane, Menzies, Bruhn, & Crnobori, 2011; O’Leary & Dubey, 1979). Students who self-manage have higher achievements in the classroom and feel a sense of satisfaction toward their work (Lapan, Kardash, & Turner, 2002). Rosenbaum and Drabman (1979) emphasize the importance of instructing students to self-manage effectively.

**Self-Monitoring**

One self-management strategy is self-monitoring (O’Reilly et al., 2002). Self-monitoring is a component of Positive Behavioral Intervention (Ganz, 2008). Self-monitoring occurs when students pay attention to a specific behavior, record the occurrences of the target behavior, and reward themselves for improvements (Ganz, 2008; Soares, Vannest, & Harrison, 2009). Used independently, self-monitoring can be effective in changing target behavior (Mace & West, 1986). Self-monitoring, however, is most effective when coupled with either self-evaluation or positive reinforcement (Mitchem & Young, 2001). Self-reinforcement is effective when used alone, but is far more effective when added to other procedures (O’Leary & Dubey, 1979). With appropriate training, students become capable of self-monitoring in natural settings. Ganz and Sigafoos (2005) researched the effect of self-monitoring in a vocational setting with adults with both ID and autism. They found that this strategy increased both independent work and verbal requests.

Self-monitoring is also effective in decreasing self-injurious behavior and tantruming in students with autism. Self-monitoring is appropriate for the classroom because not only is responsibility placed in the hands of the students, but also the amount of direct contact with the teacher decreases (Soares et al., 2009). Self-monitoring strategies have been effectively utilized with a single student with
mild ID (Crawley et al., 2006), with students with emotional disabilities (Mooney, Epstein, Reid, & Nelson, 2003), across multiple classroom settings (O’Reilly et al., 2002), and with adolescent students with brain injury in math class (Selznick & Savage, 2000). The question remains to be answered if these findings can be replicated to a classroom of students with mild ID. Although research has shown that self-management strategies are effective in reducing inappropriate behaviors, self-management strategies have not been broadly researched in students who demonstrate both inappropriate, off-task behaviors and have cognitive disabilities (Crawley et al., 2006).

Self-monitoring is both easy to implement and rewarding for teachers. Students are interested in participating in self-monitoring because they see the potential rewards. Teachers often have easy access in their classrooms to necessary materials effective for self-monitoring instruction. Minimal training is required for teachers to acquire skills to implement self-monitoring in a classroom (Ganz, 2008). Instructors must verify that the student can correctly implement the self-monitoring strategy (O’Leary & Dubey, 1979). Mace and West (1986) suggest that further research in self-monitoring include reinforcement contingent on appropriate implementation of the self-monitoring intervention. Additionally, instructors should make clear the relationship between the self-monitoring intervention, age appropriate material and resultant consequences.

Based on the work of Ganz, Cook, and Earles-Voolrath (2007) and Rankin and Reid (1995), a sequence of steps is recommended to effectively implement self-monitoring in a classroom. First, the instructor selects a target behavior and operationally defines the behavior. Second, the instructor and student discuss the purpose and benefits of self-monitoring and reinforcements available. Third, the instructor determines a method to measure the target behavior and collects baseline data. Fourth, the instructor determines an age-appropriate way for the student to self-monitor. Additionally, a criterion for reinforcement is determined based on baseline data. This criterion should be set initially so that the student frequently receives reinforcement for self-monitoring. Reinforcement fades as the student increases appropriate self-monitoring.

Fifth, the instructor teaches the student to self-monitor, using role playing and modeling. Sixth, using scaffolding, the instructor and student begin to self-monitor. Crucial to this process is that the student receives the reinforcement each time (s)he reaches a given criterion. Reinforcement validates the use of self-monitoring for the student. The instructor should continue to monitor periodically the student’s self-monitoring. Once a student effectively self-monitors a behavior, the student can learn to self-monitor additional target behaviors. The use of self-management strategies can help students with mild ID take ownership of their behavior. One type of self-management is self-monitoring. When students self-monitor, they identify a behavior, record occurrences, and reinforce improvements. Self-monitoring is most effective when used with positive reinforcement.

The purpose of the study was to examine the effect of a self-monitoring strategy on independent work behavior in students with identified mild ID being instructed in a self-contained setting. A self-monitoring intervention was implemented to determine its effects on on-task independent work behavior.

Method

Participants

Three children participated in this study. Each was seven years old, identified with MID, and had a current IEP with functional academic and/or behavior goals. Each participant received special education services from the researcher in a self-contained setting for primary students with MID.

Sally, subject one, is a seven-year-old female with an intelligence quotient (IQ) of 64 as measured by the Pictoral Test of Intelligence, Second Edition (PTI-II). She frequently rushes through work without regard to detail. She wants to be the first student to finish any given assignment. Rather than taking responsibility for herself, she focuses on other students’ behavior and task completion. She requires constant verbal prompts to stay on task. She responds to verbal reinforcement and recognition of her achievements.

Elise, subject two, is a seven-year-old female...
with an IQ of 62 as measured by the Developmental Profile, Second Edition (DP-II). She is easily distracted by her peers and surroundings. She frequently leaves her seat, engages the teacher or her peers in conversation, and manipulates classroom supplies. She requires frequent verbal prompts to stay on task, as well as reinforcement for completing work.

Jose, subject three, is a seven-year-old male with an IQ of 64 as measured by the PTI-II. He frequently zones out during independent work time. He engages in conversations with peers and questions the teacher. When given a task, he waits for individualized instruction before beginning the task. He requires prompts to return to the task. He responds well to verbal and visual reinforcement.

Design

A multiple baseline across subjects design was used in this research. Baseline data were collected for at least five days for each subject followed by the treatment and independent work phases.

The dependent variable in this research was on-task behavior. On-task behavior was operationally defined as engaging in a designated academic task for more than 180 consecutive seconds. On-task behavior included staying in the designated work area, using designated work utensils, and working independently. On-task behavior did not include leaving designated work area, sitting in designated work area idly, talking to other students or adults, engaging in self-stimulatory behavior, or engaging in destructive behavior. Frequency count was used to collect data for off-task behaviors during independent work sessions. The researcher kept track of the frequency of off-task behaviors, noting each occurrence during each session. Duration recording was also used to show the duration of each subject’s independent work session. The researcher collected the start and completion time for each subject’s independent work.

The independent variable in this research was the self-monitoring intervention program. This program incorporates the use of a visual cue to prompt subjects to self-monitor their progress on work completed during a designated independent work time. Figure 1 shows an example of the visual prompt.

Reliability

Both the researcher and a paraprofessional in the classroom collected data throughout the study. The paraprofessional in the classroom was trained on the operational definitions of target behaviors and data collection methods. The researcher and paraprofessional simultaneously collected data two days out of each week. Both observers collected data for 40% of total sessions. Total count inter-observer agreement between the two observers for the study was calculated at 96.9%.

The paraprofessional had a copy of the instruction script and observed instruction during the instruction phase. As the researcher instructed the subjects, the paraprofessional verified that the researcher followed the appropriate steps necessary to effectively implement the treatment thus maintaining fidelity to treatment.

Materials

The following materials were used to implement the intervention. Subjects self-monitored progress on a self-monitoring chart (Figure 1). The researcher used a script to instruct subjects during the treatment (Table 1). A visual cue to self-monitor was placed on all independent work. This cue was a one-inch picture of a cartoon character, selected by each subject individually in a multiple-stimulus procedure without replacement preference assessment. Sally and Elise selected a Dora the Explorer cue. Jose selected a SpongeBob Squarepants cue. See an example of this cue on the self-monitoring chart in Figure 1.

Setting

The study was conducted in the subjects’ self-contained classroom, during regular school hours. Independent work sessions occurred every day from 8:50 A.M.–9:10 A.M. Instruction occurred from 10:15 A.M.–10:45 A.M. The class consisted of eight students in first and second grades, one teacher, and two paraprofessionals. The researcher instructed these students daily and knew each student’s individual needs and motivators.
Procedure

Baseline data were collected for at least five sessions or until a stable trend was established. A stable trend was defined as an increase of ten or more off-task behavior occurrences in a minimum of three sessions. Following baseline, subjects were taught the self-monitoring intervention. The three subjects selected were unable to begin an independent work task and remain on-task for the duration of the independent work session, which occurred daily from 8:50 A.M.–9:10 A.M. Each subject was given the intervention of a visual cue to self-monitor during completion of independent work. In the study, subjects were shown a visual cue to self-monitor behavior during independent work time. This cue was a one-inch picture of either SpongeBob Squarepants or Dora the Explorer. This visual cue appeared at the end of a line of work.

Independent work varied by subject, but the format was the same. Each worksheet had five tasks to complete (count a set of items, find and circle a designated letter, count money, etc.) All work was at the independent or 95% accuracy level of difficulty. Each subject’s work had embedded visual cues to self-monitor, while working independently, at the end of each task. The visual cue, a one-inch cartoon picture, was placed at the end of each line of work. The visual cue to self-monitor varied by subject interest but in no other way. A multiple-stimulus procedure without replacement preference assessment was given to each subject to determine the most motivating cue (Leon & Iwata, 1996).

The first set of independent work had five visual cues, one after every line of work. After the subjects successfully completed independent work for three consecutive sessions and improved on-task behavior, they moved to the second set of independent work. This set had three visual cues, one after every other line. The following set of independent work had two visual cues. In the final set of independent work, one visual cue was found at the end of the worksheet.

Phase one of the intervention included instruction. During instruction, the researcher used a script to instruct the subjects how to
self-monitor. The researcher defined the terms self-monitoring and self-monitoring chart. The researcher instructed and modeled the following procedure: complete a task on the worksheet, identify the visual cue to self-monitor, take a sticker and place it on the self-monitoring chart, and complete the next task on the worksheet. All work and self-monitoring chart completion was to be done independently, without additional verbal cues.

The self-monitoring chart corresponded to the subject’s visual cue and charted on-task behavior during independent work time by gradually indicating completion of work. Subjects paused from the independent work to add a sticker for reinforcement to their individualized self-monitoring charts. This chart tracked the subjects’ ability to remain on-task while working independently. The researcher instructed the subject to complete all tasks on the worksheet and self-monitor using the visual cue and self-monitoring chart until the self-monitoring chart was full of stickers. A chart full of stickers indicated the completion of the independent work. Following direct instruction, the researcher and subject worked together to complete two tasks on the worksheet. Finally, the researcher watched the subject complete two tasks on the worksheet independently.

Following day one of instruction, each subject was given an opportunity to complete independent work using the self-monitoring strategy. If the subject successfully completed the independent work using the self-monitoring chart, (s)he did not receive further instruction. If the subject did not successfully and independently complete the work using the self-monitoring chart, the researcher instructed the subject a second time.

Once the subject completed the independent work and self-monitoring chart, (s)he turned in the self-monitoring chart to the teacher. If the subject had successfully completed the independent work and self-monitoring chart, the subject received reinforcement specifically valuable to the student (computer time, coloring a picture, completing a puzzle, etc.) Sally preferred computer time, Elise, blocks, and Jose, puzzles. Although each subject had reinforcement preferences, they were able to choose from a menu of reinforcers.

After three days of successful completion of

---

**TABLE 1**

**Instruction Script**

1. Tell: you are going to learn how to self-monitor while you work.
2. Show: self-monitor visual cue.
3. Tell: this picture (of Dora the Explorer/SpongeBob Squarepants) shows me that it is time to stop working and self-monitor.
5. Tell: when I self-monitor, I put a sticker on this chart.
6. Tell: when you see Dora the Explorer/SpongeBob Squarepants, I stop working and put a sticker on my chart.
7. Tell: after I put a sticker on my chart, I go back to my work.
8. Tell: watch me.
10. Tell: I am doing my work.
11. Show: see the self-monitor cue.
12. Tell: I see Dora the Explorer/SpongeBob Squarepants. It is time to give myself a sticker.
13. Show: stop work; take a sticker and place it on the self-monitoring chart.
14. Tell: I am putting a sticker here because I have finished some work.
15. Show: go back to the worksheet and start next problem.
16. Tell: after I put a sticker on my chart, it is time to work.
17. Tell: now let practice together.
18. *Walk through steps 10–17 with the student self-monitoring.*
19. Tell: now show me how you self-monitor.
20. *Watch student walk through steps 10–17 independently; prompt when necessary.*
independent work using the self-monitoring chart, the subject advanced to phase two of the intervention. In phase two, the frequency of visual cues decreased from five to three. After three days of successful completion in phase two, the subject advanced to phase three of the intervention. In phase three, the frequency of visual cues decreased from three to two. Finally, after three days of successful completion in phase three, the subject advanced to phase four of the intervention. In phase four, the frequency of visual cues decreased from two to one. Each time a subject moved from one phase to another, the self-monitoring chart changed to correspond to the number of cues on the independent work. When moving through the intervention phases, the third day of successful independent work completion could not occur on a Monday. It was unknown if the subject would effectively remember the intervention after two weekend days of not practicing. Therefore, if the third day of successful independent work completion occurred on a Monday, then the subject would complete independent work at the same phase on Tuesday. If successful for a fourth day, the subject would advance to the next phase.

Results

Figure 2 titled “Sally” displays data collected over a six and a half week period for Sally, Elise, and Joe. Sally was taught the self-monitoring intervention to use during independent work time. The graph displays both the frequency of off-task behavior during independent work time and the amount of time it took Sally to complete the independent work. During the first six days of baseline, Sally was given independent work to complete during the independent work session, without any further support or instruction. During instruction, Sally was taught the self-monitoring strategy. The researcher taught her the intervention, they practiced the intervention together, and the researcher observed Sally attempt the intervention independently. After Sally demonstrated an understanding of the intervention, she began using the self-monitoring strategy independently during the independent work session. During baseline, Sally averaged 5.6 occurrences of off-task behavior. After learning the self-monitoring strategy, Sally averaged 1.1 occurrences of off-task behavior. At the beginning of intervention, Sally spent more time completing independent work than during baseline. After day 13 of the study, Sally’s completion time decreased by more than four minutes.

Baseline data were collected for Elise for 11 days. After the first day of instruction, Elise was not able to accurately complete the self-monitoring chart. Therefore, she received a second day of instruction. Following the second day of instruction, Elise was able to accurately use the self-monitoring strategy while completing independent work. The researcher instructed Elise in the same way Sally was instructed. During baseline, Elise averaged 7.5 occurrences of off-task behavior. After learning the self-monitoring strategy, Elise averaged 1.8 occurrences of off-task behavior. Throughout the duration of the study, Elise’s completion time decreased by over four minutes.

Baseline data were collected for Jose for 16 days. The researcher followed the same procedure in teaching Jose the self-monitoring strategy as used with Sally and Elise. During baseline, Jose averaged 5.3 occurrences of off-task behavior. After learning the self-monitoring strategy, Jose averaged .6 occurrences of off-task behavior. Throughout the duration of the study, Jose’s completion time decreased by over six minutes.

Within this study, the use of a self-monitoring strategy successfully decreased occurrences of off-task behavior during independent work time. All three subjects demonstrated a decrease in occurrences of off-task behavior during independent work time. Additionally, Elise and Jose spent less time working on independent work after learning the self-monitoring strategy. As Sally learned the self-monitoring strategy, her completion time increased, but as she familiarized herself with the strategy, her completion time decreased.

Discussion

The purpose of this study was to determine the effect of a self-monitoring strategy on independent work behavior. Specifically, the study investigated occurrences of off-task beha-
behavior and completion time of independent work with three students, with identified MID and IEPs with functional academic and behavior goals. Results of the study indicate that a self-monitoring strategy, in which students track progress while completing independent
work, effectively decreased the occurrences of off-task behavior. Additionally, in all three subjects, the intervention decreased independent work completion time.

Sally was enthusiastic to learn the self-monitoring strategy, specifically to use the self-monitoring chart while completing independent work. She quickly learned how to use the strategy and effectively used it independently after one day of instruction. Data collected on Sally indicate that the self-monitoring strategy effectively decreased the frequency of off-task behavior. Although not by a significant amount, the strategy decreased her completion time. Using the self-monitoring strategy encouraged her to remain focused while completing independent work. She took pride in maintaining responsibility for her work.

During the first day of instruction, Elise quickly learned the self-monitoring strategy. She was able to demonstrate understanding of the strategy during the instruction session, but then next day was not successful at implementing the strategy independently. Therefore, the researcher instructed her in a second instruction session. On the second day of using the strategy during the independent work session, she was able to successfully self-monitor independently. Data collected for Elise indicate that the self-monitoring strategy effectively decreased the frequency of off-task behavior. Additionally, the strategy decreased her completion time. Elise celebrated to herself each time she successfully self-monitored during independent work time. As she turned in her independent work and self-monitoring chart, she would say aloud to herself, “You did it Elise” (or another similar phrase).

During baseline, Jose demonstrated a high frequency of off-task behavior. He quickly learned the self-monitoring strategy. He effectively used the strategy to self-monitor during independent work time the first day following instruction. Data collected for Jose indicate that the self-monitoring strategy significantly decreased the frequency of off-task behavior. Additionally, the strategy significantly decreased his completion time. Jose quickly realized that the less time he spent on independent work, the more time he could spend with a self chosen reinforcement.

Implications for Education

Findings in this study suggest that the use of a self-monitoring strategy helps to decrease the frequency of off-task behavior. These off-task behaviors include any behaviors irrelevant to the academic task (Gickling & Armstrong, 1978). Additionally, the strategy decreases the completion time of independent work. This strategy incorporates specific and descriptive instruction, which enhances task completion (Bouxsein et al., 2008). The research found the self-monitoring strategy to work with early elementary students with identified MID.

Teaching students to self-manage behavior gives students the responsibility of owning their behavior choices. This enhances the students’ independent functioning. Additionally, it enables further integration into the community at large (Hume & Odom, 2007; Selznick & Savage, 2000). As students self-manage, they gain confidence in their abilities both in the classroom and community (Lapan et al., 2002).

This strategy could be taught to an entire class. A teacher could implement this self-monitoring strategy in a classroom with minimal training (Ganz, 2008). An independent work session in which students work on-task for the duration of the session would allow a teacher to work one-on-one with a student, assess an individual or small group, or work with a small group of students for remedial instruction, without interruption. Additionally, students could generalize this strategy to other academic tasks, as they complete work independently or in small groups, during various instruction times in a school day.

Based on the results of this study, when students self-monitor behavior while completing independent work, they have less frequent occurrences of off-task behavior. When students have less frequent occurrences of off-task behavior, the teacher can spend less time redirecting and instructing the whole group of students. This provides the teacher more time to work with other students, either one-on-one or in a small group, without interruptions.

Limitations

This study may have threats to both internal and external validity. Maturation is a potential
threat to internal validity. All three subjects are in critical learning stages and physical and emotional maturation may have contributed to their on-task behavior improvement. Further research on older students with MID or other cognitive disability could eliminate this threat. Selection is another potential threat to internal validity. Each subject was systematically selected.

A potential threat to external validity is reactive arrangements, otherwise known as the Hawthorne effect. The subjects were aware of their participation in the study. Therefore, this acknowledgement of participation may have affected their performance during independent work time, using the self-monitoring strategy (Salkind, 2006).

Future Research

This study could be replicated on older students with identified MID, as well as students with other disabilities in both self-contained settings and resource settings, as long as their behavior needs are similar to the subjects used in this study. Future research may find that some populations of students need more cues to self-monitor than other populations. Also, further research could determine this strategy’s effectiveness among various populations of students and during various academic tasks.

Summary

This study examined the use of a self-monitoring strategy during independent work time, and its effect on on-task behavior and completion time. A multiple-baseline across subjects design was used for the three subjects who participated in the study. Results of occurrences of off-task behavior in three subjects were analyzed to determine the effect of the intervention on on-task behavior. Examination of the data provided results indicating that the use of a self-monitoring strategy during independent work time decreased both occurrences of off-task behavior and completion time. After learning the self-monitoring strategy, all three subjects were able to effectively implement the strategy during independent work sessions.

References


Mitchem, K. J., & Young, R. (2001). Adapting self-


Received: 14 December 2010
Initial Acceptance: 1 March 2011
Final Acceptance: 28 June 2011