The Effects of Self-Monitoring of Task Completion Time on Assignment Completion and Accuracy

Kathryn B. Wright
Longwood University

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The Effects of Self-Monitoring of Task Completion Time on Assignment Completion and Accuracy

Kathryn B. Wright
Longwood College

This thesis has been approved by
Dr. Ruth Meese, Chairperson
Dr. Patty Whitfield
Dr. Rachael Mathews
Date of Approval May 8, 1996

Running Head: SELF-MONITORING
Abstract

The purpose of this study was to determine if productivity and accuracy would increase if subjects recorded the amount of time it took to complete assignments. Two students with learning disabilities were taught to record the times assignments were started and finished and to calculate the difference. Data were collected on the time spent on assignments, the percentage of the assignment completed, and the percentage of the assignment completed correctly. The results showed that productivity and the amount of time spent on assignments improved slightly. The accuracy of the work, however, decreased. Implications for future research are discussed.
Acknowledgments

Thanks first and foremost to my mother for inspiring me to teach, being my role model, and being there for me. I am glad that I followed in your footsteps.

Thanks to my father- and mother-in-law for the many evenings of looking after my family. You have made all of this possible for me.

Thanks to my husband for all his support and understanding. I know it has not been easy for you.

Thanks to my children for being patient while Mom was away at school. You are my two most favorite people in the world.

Thanks to Dr. Meese, Dr. Whitfield, and Dr. Mathews for their guidance and encouragement and for making this a most pleasant and enjoyable experience. You have made it fun to learn.

Thanks to a very special friend, Louise, for all your support, laughter, and conversations to and from school. This would have been a very difficult accomplishment without you.
Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Appendices by Title</td>
<td>5</td>
</tr>
<tr>
<td>List of Figures by Title</td>
<td>6</td>
</tr>
<tr>
<td>Literature Review</td>
<td>7</td>
</tr>
<tr>
<td>Cognitive Behavior Modification</td>
<td>8</td>
</tr>
<tr>
<td>Self-Management</td>
<td>9</td>
</tr>
<tr>
<td>Self-Monitoring</td>
<td>10</td>
</tr>
<tr>
<td>Statement of Purpose</td>
<td>11</td>
</tr>
<tr>
<td>Method</td>
<td>13</td>
</tr>
<tr>
<td>Subjects and Setting</td>
<td>13</td>
</tr>
<tr>
<td>Procedures</td>
<td>13</td>
</tr>
<tr>
<td>Baseline and Data Collection</td>
<td>14</td>
</tr>
<tr>
<td>Intervention</td>
<td>14</td>
</tr>
<tr>
<td>Research Design</td>
<td>15</td>
</tr>
<tr>
<td>Results</td>
<td>17</td>
</tr>
<tr>
<td>Discussion</td>
<td>20</td>
</tr>
<tr>
<td>References</td>
<td>23</td>
</tr>
<tr>
<td>Appendices</td>
<td>29</td>
</tr>
<tr>
<td>Figures</td>
<td>41</td>
</tr>
</tbody>
</table>
List of Appendices by Title

Appendix A: Letter Requesting Permission from the School Division to Conduct Research.

Appendix B: Letter Requesting Permission from the School Principal to Conduct Research.

Appendix C: Consent Form for Students to Participate in the Study.

Appendix D: Letter to Parent Explaining Study and Requesting Permission for Student Participation.

Appendix E: Teacher Data Sheet.

Appendix F: Student Data Sheet.
List of Figures by Title

Figure 1: Problems Completed ................. 42
Figure 2: Time to Complete Tasks ............ 43
The Effects of Self-Monitoring of Task Completion Time on Assignment Completion and Accuracy

Efficient learners seem able to control and direct their thinking processes in order to facilitate learning and to deal with abstract concepts needed for academic learning. A characteristic of students with learning disabilities (LD) is that they lack functional cognitive learning strategies (Katims & Alexander, 1987). Snider (1987) stated that training based on a cognitive viewpoint would emphasize awareness of one’s ability to self-regulate behavior. It would seem that training based on a cognitive viewpoint would also emphasize awareness of cognitive learning strategies.

Being aware of one’s own cognitive processes and the factors that affect those processes is referred to as metacognition (Kneedler & Meese, 1988). Metacognitive deficits have been found among children with learning disabilities. The LD child has been characterized as a passive learner (Ryan, Short & Weed, 1986). Inadequate understanding of the relationships among tasks, strategies, and outcomes is a significant component of inactive learning styles (Ryan, et al.). Findings by Licht (1983) revealed that the student with learning disabilities believes that he or she has no, or little, control over the outcome of
events. The students do not see any relationship between effort and achievement (Kneedler & Meese, 1988). Loper and Hallahan (1982) found that children with learning disabilities are deficient in their knowledge about the process of attention. Hallahan and Kneedler (1979) found that LD students lack task approach skills, including the ability to focus on the relevant task information.

Cognitive Behavior Modification

Lack of metacognitive skills indicates the need for an intervention. Cognitive behavior modification (CBM) offers an educational alternative that appears to meet the needs of many children with learning disabilities (Kneedler & Meese, 1988). The purpose of CBM is to train students to use strategies, to improve their academic performance, and to develop a positive attitude toward their ability to use these learning strategies actively to influence performance (Williams & Rooney, 1986). CBM aims to place behavior under the child’s internal control (Powers & Franks, 1988).

Meichenbaum was a primary contributor to CBM. His emphasis was on teaching self-instructional strategies (Henley, Ramsey & Algozzine, 1993). He defined CBM as an analysis of the thinking processes involved in performing a task rather than merely the assessment of the task (Meichenbaum, 1977). A basic premise of CBM is that one
cannot change behavior without increasing the individual's awareness of consciousness or notice of a behavioral pattern (Meichenbaum, 1986).

CBM originated as a treatment approach for clinical problems in psychology, but has been extended to academic domains involving students with mild disabilities (Hallahan, 1980). According to Hall and Hughes (1989), CBM is based on the assumption that cognitive mediating events affect behavior and individuals are active participants in their own learning. The goal of CBM is to produce change in the individual by modifying his or her thinking (Keogh & Glover, 1980).

According to Kaplan (1991) one of the major advantages of CBM is that the subjects themselves are the primary change agents. Kaplan's research, therefore, focused on helping the individual to gain self-control. CBM procedures include such interventions as cognitive restructuring, memory strategies, modeling, self-reinforcement, self-instruction, self-monitoring, and self-recording (Katims & Alexander, 1987; Kneedler & Meese, 1988; Powers & Franks, 1988).

Self-Management

Self-management is a goal for every teacher in working with every student (Shapiro & Cole, 1994), the ultimate goal
Self-monitoring refers to strategies that result in the modification of one's own behavior (Cooper, et al., 1987; Shapiro & Cole, 1994). Self-management procedures offer opportunities to establish long-term changes among students who are struggling academically. The procedures are relatively easy to use and demands on the classroom teacher may be reduced. Self-management procedures also have the potential to facilitate generalization (Shapiro & Cole, 1994).

Shapiro and Cole (1994) defined a contingency-based approach to self-management. The skills necessary include self-monitoring, self-evaluation, and self-reinforcement. Professionals generally agree that self-monitoring is a two-step process involving observation of one's own behavior and then recording that behavior (Hallahan & Kauffman, 1994; Kneedler & Meese, 1988; Shapiro, 1984; Shapiro & Cole, 1994). Some interventions, however, use just self-monitoring as the primary intervention.

Hallahan, Marshall, and Lloyd (1981) found that self-management interventions were useful in increasing attention to task in students with learning disabilities. Most studies have used random audio tones to signal the student to record whether or not he or she was paying attention.
Self-Monitoring

Self-monitoring is one aspect of self-management. Hallahan, Lloyd, Kneedler, and Marshall (1982) found self-monitoring to result in higher performance than teacher monitoring. Cooper, et al. (1987) noted that not only does self-monitoring often change behavior, but also the change is almost always in the desired direction. Self-monitoring encourages the student to become a more responsible agent in his or her own educational process (Rooney, Hallahan, & Lloyd, 1984). Teacher effort to maintain student behavior is reduced (Shapiro, 1988). Self-monitoring alone has been found sometimes to result in behavior change. The key to implementing successful self-monitoring is to have well defined behaviors and simple recording procedures (Shapiro, 1984).

Educational research has focused on self-monitoring of attention and performance, with the majority of studies on attention (Harris, Graham, Reid, McElroy, & Hamby, 1994). A study by Hallahan, Marshall, and Lloyd in 1981 showed, when attention was self-monitored, on-task behavior increased. In 1986, Harris conducted a study that showed increases in on-task behavior when attention and productivity were self-monitored. However, the results with self-monitoring of productivity were mixed. Dunlap and Dunlap (1989) found
that self-monitoring using a checklist increased correct responses on subtraction problems. Several studies show that self-monitoring of accuracy is more beneficial than monitoring attention (Maag, Reid, & DeGangi, 1993; Lam, Cole, Shapiro, & Bambara, 1994; Harris, et al.), and Mace and Kratochwill (1988) suggested that self-recording of attention might even interfere with learning.

**Statement of Purpose**

The child with a learning disability needs to be aware of how he or she spends time. However, awareness of time and attention to task are difficult skills for many students with learning disabilities. The purpose of this study, therefore, was to determine if self-recording of the time spent on classroom assignments would enhance the student's completion of assignments and the accuracy of his or her work.
Method

Subjects and Setting

Participating subjects, one male and one female, came from a self-contained, eighth grade math class for students with learning disabilities. The students attended a small rural junior high school in Virginia. Both students were identified as learning disabled by the eligibility committee of the local public school system. Their eligibility was based on federal, state, and local guidelines.

The students were selected to participate in this study due to their consistent failure to complete assigned work in an appropriate amount of time. The students were in class for 80 minutes each day. The class was staffed by a full time math teacher.

Procedures

Permission to conduct this research was obtained from the local school division (See Appendix A) and building principal (See Appendix B). Permission for the students to participate was obtained from the parents (See Appendix C). The purpose and the procedures were explained to the parents in a written letter (See Appendix D). Participation was strictly voluntary. Complete anonymity of student names, school name and location was guaranteed.
Once all permissions were secured, baseline data were collected. After four days of collecting baseline, the first student was introduced to the intervention. The second student was introduced to the intervention seven days after baseline data collection began.

Baseline and Data Collection

Data were only collected during the time students were practicing computational skills at their desks. Usually, twenty to thirty minutes a day were allotted for this. The teacher recorded data daily on a data sheet (See appendix E) the number of problems assigned to each student, the number of problems completed by each student, the time each student started and completed the assignment, and the accuracy of the completed problems were each recorded. Percentages were calculated for the number of problems completed out of the number assigned and the number of problems correct out of the number completed. The amount of time to complete the assignment also was computed. All computations were recorded on a single data sheet and then placed on corresponding graphs.

Intervention

Each intervention incorporated a self-monitoring procedure whereby the student recorded the times he or she began and finished the assignment. The student computed the
amount of time it took him or her to complete the assignment. He or she then recorded the time on a data sheet (See Appendix F). Coinciding with the self-monitoring of the student, the teacher continued to record the percentage of problems completed and the percentage of problems completed correctly.

Based on baseline data, the teacher and student discussed the student's performance in completing assignments and completing them accurately. Each student was then trained in the procedure of self-monitoring. He or she was instructed in the proper procedure to record the times that he or she began the assignment and completed the assignment. He or she also was taught how to calculate the elapsed time. The teacher assisted the student in recording the appropriate information for a few days. The student then became responsible for his or her own recording.

Research Design

A single-subject multiple baseline across subjects research design was used. The intervention was implemented with one student, while baseline data was continued on the other. Once a trend was established with the first student, the intervention was implemented with the second. The effectiveness of self-monitoring the time it takes to
complete assignments was assessed to determine if assignment completion and accuracy increased.
Results

Baseline data were collected on Student 1 four days prior to intervention. His mean level of performance for problem completion was 96%. The median percent of problems completed correctly was 95%, with a range in scores from 55 to 100%. After he started recording the amount of time he spent working on each assignment, his mean level of problem completion increased to 98%. However, his median percent of problems completed correctly decreased to 74% with a range in scores from 60% to 90% (See Figure 1). Time spent completing problems during baseline ranged from 30 to 50 minutes with a mean of 36 minutes. After intervention, the amount of time spent completing problems ranged from 7 to 36 minutes with a mean of 22 minutes. The average amount of time spent on assignments decreased dramatically once the intervention was implemented (See Figure 2).

Baseline data was collected on Student 2 for seven days prior to intervention. The results showed a mean of 94% of all problems being completed. The median percent of problems completed correctly was 94%, with a range in scores from 40 to 100%. After she started recording the amount of time spent working on each assignment, her mean level of completed problems increased to 100%. The median percent of problems she completed correctly decreased slightly to 90%,
Self-Monitoring 18

with a range from 20% to 90% (See Figure 1). The time spent on completing problems ranged from 15 minutes to 48 minutes with a mean of 33 minutes during baseline. Once the intervention was implemented the time spent ranged from 14 to 24 minutes with a mean of 20 minutes. Student 2 also showed a dramatic decrease in the amount of time used to complete her assignments when recording the amount of time she was working (See Figure 2).

According to Alberto and Troutman (1995), the baseline is stable if no data point varies more than 50% from the mean. All data points for Student 1 can then be considered stable. Student 2, had one data point to fall out of the 50% range during baseline and intervention for percentage of problems completed correctly. However, all data points for percentage of problems completed were stable.

The baseline for Student 1 showed a trend to complete all problems assigned. However, for accuracy of completed problems, no trend appeared. Once the intervention was implemented, the trend of completing all problems assigned continued. No trend was established for accuracy of problems. However, a definite trend did appear showing a decrease in the amount of time spent working on assignments.

Student 2 showed no trend for either completion of assignment or accuracy until after Student 1 began his
Self-Monitoring 19

intervention. At that time Student 2 established a trend of completing all problems assigned, which she continued throughout her intervention. She did not establish a trend for completing problems accurately. However, she also developed a definite trend showing a decrease in the amount of time spent doing the assignments.
Discussion

The results indicated that self-recording of time to complete assignments can be used to increase the number of problems completed and decrease the amount of time it takes to complete them. However, self-recording of time alone was not sufficient to increase the accuracy of the students' work. This indicates that an additional intervention is needed.

The present study supports past studies that show self-monitoring is an effective treatment for increasing attention and productivity (Hallahan, et al., 1981). One of the primary uses of self-monitoring has been for the purpose of increasing on-task behavior during written seat-work assignments (Hallahan, et al., 1981). The present study showed that self-monitoring the amount of time to complete assignments increased the number of problems done and decreased the amount of time it took to do them. On-task behavior increased slightly when the student was recording the amount of time he or she spent doing the assignment. A possible explanation for the decrease in the amount of time it took for the students to complete their assignments is that, by recording the time it took to complete the work, student's focused their attention on the task at hand. The
very act of recording aspects of one’s own behavior sometimes causes that behavior to change (Nelson, 1977).

Lovitt and Ballew (1988) made the observation that self-recording alone is not as effective as self-recording along with some additional form of reinforcement. Klein (cited in Shapiro & Cole, 1994) concluded that self-recording on-task behaviors might result in an increase in attention, but was also unlikely to show any consistent change in academic performance. Recording the time it took to complete assignments had some positive effect on the number of problems completed and decreased the time it took to complete them, but the accuracy of the students’ work decreased. It is possible that had there been an additional intervention, either self-recording of accuracy or a reinforcer, the accuracy of the work would have also increased. A possible explanation for the decrease in accuracy might be that by recording the amount of time spent working, the student was in a race with the clock to see how fast he or she could complete the work.

The present study was initiated because students were taking more time than needed to complete classroom assignments. Prior to initiating this study the students missed quite a lot of time from school due to the weather. After returning to school, the students seemed to be more
interested in doing their work and thus improved. It should be noted that during the time research was conducted, several days occurred when data were not collected. Four days were spent taking standardized tests. On these days class was either shortened or not held. Some time was spent preparing the students for the test. Also, on some days the students were absent. The data from a third student had to be discarded because of excessive absences and refusal to participate in class activities. It was noted that with this student, on days when he spent an appropriate amount of time doing his work, his grades were higher.

During the course of the present study no literature was found on recording the actual time spent doing assignments. More research needs to be conducted on self-recording of time spent completing assignments. DiGangi, Maag, and Rutherford (1991) concluded that self-monitoring on-task behavior had more affect on productivity than accuracy. More studies need to be done to identify interventions to increase accuracy that could be used in conjunction with monitoring time.
References


comparison studies. Learning Disability Quarterly, 17(2), 121-139.


Hawkins (Eds.), Behavioral assessment (pp. 217-24). New York: Brunner/Mazel, Inc.


Appendix A

Letter Requesting Permission from the School Division
to Conduct Research
February 14, 1996

Superintendent

Dear Sir:

I am currently seeking a master’s degree in mild disabilities from Longwood College. In order to complete my studies, I must do research and write a thesis. I have chosen to do a study to determine if self-recording of the time spent on classroom assignments will enhance the student’s completion of assignments and the accuracy of his or her work.

This letter is being sent to ask your permission to conduct this study in my eighth grade self-contained class. The anonymity and confidentiality of the students and the school will be kept. Permission for the students to participate will be obtained from the parents or guardian. Participation will be on a voluntary basis only. Whether the students participate or not, it will not in any way affect their instructional program.

Thank you for your cooperation in this matter.

Respectfully,

Kathryn B. Wright
Appendix B

Letter Requesting Permission from the School Principal to Conduct Research
February 14, 1996

Principal

Dear Sir:

I am currently seeking a master's degree in mild disabilities from Longwood College. In order to complete my studies, I must do research and write a thesis. I have chosen to do a study to determine if self-recording of the time spent on classroom assignments will enhance the student's completion of assignments and the accuracy of his or her work.

This letter is being sent to ask your permission to conduct this study in my eighth grade self-contained class. The anonymity and confidentiality of the students and the school will be kept. Permission for the students to participate will be obtained from the parents or guardian. Participation will be on a voluntary basis only. Whether the students participate or not, it will not in any way affect their instructional program.

Thank you for your cooperation in this matter.

Respectfully,

Kathryn B. Wright
Appendix C

Consent Form for Students to Participate in the Study
I, ______________________ consent to allow my child or legal subject to participate in the research project entitled "The Effects of Self-Monitoring of Task Completion Time on Assignment Completion and Accuracy."

I acknowledge that the purpose of this study, the procedures to be followed, and the expected duration of my child’s participation have been explained to me. Possible benefits of this project have been described to me.

I acknowledge that I have had the opportunity to obtain additional information regarding this research project, and that any questions I have raised have been answered to my full satisfaction. Further, I understand that my child’s or legal subject’s participation in this research is voluntary, and I am free to withdraw my consent at any time and to discontinue participation in this project without prejudice. I understand that no information will be presented which will identify my child or legal subject as the subject of this study.

I understand that if I have concerns or complaints about my child’s or legal subject’s treatment in this study, I am encouraged to contact the Office of Academic Affairs at Longwood College at (804) 395-2010.

Finally, I acknowledge that I have read and fully understand this consent form. I sign it freely and voluntarily. A copy has been given to me.

Date: _______________ Signed: ______________________ (Parent)
Appendix D

Letter to Parent Explaining Study and Requesting Permission for Student Participation
February 14, 1996

Dear Parent,

I am your child’s mathematics teacher. I am also a student at Longwood College. I am currently working on my master’s degree in mild disabilities. In order to complete my studies I have to do research and write a thesis. I have chosen to do a study to determine if self-recording of the time spent on classroom assignments will enhance the student’s completion of assignments and the accuracy of his or her work.

I will be collecting data on the amount of time your child spends working on given classroom assignments. I will record the percentage of problems completed and the percentage of problems completed correctly. At some point I will teach your child how to record the amount of time he or she spends on the given classroom assignments. I will continue to record the percentage of problems completed and the percentage of problems completed correctly. I am hoping that by making the student aware of how much time he or she is working will increase the amount of work he or she does in the allotted time. I am also looking for an increase in the accuracy of the work done.

I am asking you to give me permission to use any data collected about your child in my study. Your child’s name will not be used in any way. Neither will the school or the area in which you live be identified in the study. All data collected will be kept in the strictest of confidence.

Participation in this study is voluntary. If you choose to have your child be a part of this study, please complete the attached form and return to me at the above address. If you have any questions, please feel free to call me.

Thank you very much for your cooperation in this matter.

Respectfully,

Kathryn B. Wright
Appendix E

Teacher Data Sheet

Self-Monitoring of Task Completion Time
### Data Sheet

Name ________________

**Self-Monitoring of Task Completion Time**  
(to be completed by teacher)

<table>
<thead>
<tr>
<th>Date</th>
<th>1. Number of problems assigned.</th>
<th>2. Time started.</th>
<th>3. Time finished.</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>4. Number of problems completed.</th>
<th>5. Number of problems correct.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percentage of problems completed.  
(#4 / #1)

Percentage of problems correct.  
(#5 / #4)

Number of minutes to complete assignment.  
(#3 - #2)

Comments:
Appendix F

Student Data Sheet

Time to Complete Assignments
<table>
<thead>
<tr>
<th>Data Sheet</th>
<th>Name</th>
</tr>
</thead>
</table>

**Time to Complete Assignments**

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<th>Date</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Finished</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Time Started</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Number of minutes to complete assignment.**
Figure 1. Percentage of Problems Completed and Percentage of Problems Completed Correctly While Recording Time Needed for Completion.

PROBLEMS COMPLETED

Baseline | Intervention

Student 1

Student 2

● = problems completed

△ = Problems completed correctly
Figure 2. Time Spent Completing Assignments.

TIME TO COMPLETE TASKS

Baseline  Intervention

Student 1

Minutes

50
40
30
20
10
0

Student 2

Minutes

50
40
30
20
10
0

Days