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Using Video Self-Modeling to Improve Reading Fluency in School Aged Children with Specific Learning Disabilities

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A thesis submitted to the faculty of
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Master of Science

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ABSTRACT

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Effective reading interventions for students with specific learning disabilities (SLD) are needed. A multiprobe multiple baseline across participants design was used to evaluate the effects of a video self-modeling intervention (VSM) on reading fluency skills. The VSM intervention's effects on self-efficacy were also measured. Four male middle school students with SLD watched a pre-recorded video of themselves reading a passage fluently and were then asked to read another passage. Words correct per minute (WCPM) and accuracy data were taken. Results showed that students read significantly more words correct when they watched themselves read the same passage they were about to read. This study shows that having students watch videos of themselves read, especially if they watch the same passage they will read afterwards, is easy to implement, cost-effective, and worth further investigation.

Keywords: specific learning disability, reading fluency, video self-modeling, iPad, self-efficacy

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DESCRIPTION OF THESIS STRUCTURE

The structure of this thesis, *Using Video Self-Modeling to Improve Reading Fluency in School Aged Children with Specific Learning Disabilities*, is presented in a dual/hybrid format. This means that both traditional and journal publication formatting requirements are met.

The preceding pages of this article meet university standards for thesis submissions. The first section is presented as a "journal-ready" article that meets educational peer-reviewed journal style requirements, so that this article is ready for submission to a scholarly journal. There is an extended review of literature included in Appendix A. The consent form for research; phase fidelity checklist forms; the data collection form; self-efficacy questionnaires; and the social validity questionnaires are included in Appendix B, C, D, E, and F respectively.

Introduction

According to the National Assessment of Educational Progress (NAEP; 2015), 92% of students with disabilities in the 8th grade are below proficient in reading. Of these students, 35% are classified under the Individuals with Disabilities Education Improvement Act (IDEIA; 2004) as having a learning disability (National Center for Learning Disabilities, 2014). Specific learning disability (SLD) is the most prevalent classification (National Center for Learning Disabilities, 2014). Students who fail to learn to read experience many unwanted consequences as they move through school and enter post-school life. It can lead to poor academic outcomes, increased problem behaviors, higher probability of dropping out of school, limited employment opportunities, and a greater chance of living in poverty (National Institute for Literacy, 1997). There is an urgent need for research-based instructional supports for reading if students are to be successful in school and in their post-school lives (Hitchcock, Prater, & Dorwick, 2004).

Specific Learning Disabilities

IDEIA defines SLD as a language disorder that manifests itself in the "imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations" (p. 12-13). Learning disabilities are caused by neurological differences in brain structure or chemistry. These differences can interfere with receiving, storing, processing, retrieving, or communicating information (IDEIA, 2004). Individuals with SLD may experience low self-esteem, set low expectations for themselves, struggle with underachievement and underemployment, and have fewer friends (Cortiella & Horowitz, 2014).

Main Components of Reading Instruction

In 1997, Congress asked the National Institute of Child Health and Human Development and the U.S. Department of Education to form the National Reading Panel. The panel's task was

to review research on how children learn to read and determine the most effective methods of teaching reading. They identified five components that need to be addressed in reading instruction. These five components are the following: phonemic awareness, phonics, fluency, vocabulary, and comprehension (National Reading Panel, 2000).

Students with SLD often have difficulties with reading fluency, which in turn leads to difficulties with reading comprehension (Musti-Rao, Hawkins, & Barkley, 2009). If students are spending too much time processing words there is little room left in the working memory to think about the text as a whole. In students with SLD the working memory is primarily focused on word-level processing preventing understanding at the content-level (Chard, Vaughn & Tyler, 2002).

A student with a SLD evident in reading fluency difficulties will exhibit labored reading. They may read slowly, pause often, and seem disconnected to the text. Their accuracy, reading words correctly, may also be poor (Chard et al., 2002).

Reading fluency is an essential skill for all students to master, but students with SLD often need extra support to do so. Unfortunately, fluency is often a neglected aspect of reading programs. This could be due to the fact that there are not many well-known effective interventions. The evidence-based practices of video modeling (VM) have shown promises as means of increasing reading fluency of students with SLD.

Video Modeling

The intervention of VM is emerging as a cost- and time-efficient intervention for students with disabilities. VM involves showing a student a model demonstrating the correct performance of a target behavior via video format (Bellini & Akullian, 2007). VM has been widely researched

as an intervention for social and functional skill development. Research is increasingly being conducted on VM and its effects on academic skills of learners with disabilities (Clinton, 2015).

There are several variations of VM that have been identified in literature. Variations include video prompting (VP), video modeling other (VMO), point-of-view video modeling (POV), and video self-modeling (VSM; Clinton, 2015).

VP comprises of showing a single step at a time and allowing the student to complete the step before showing the next video clip (Taber-Doughty et al., 2011). VMO involves video footage of someone other than the participant (adult or peer) correctly engaging in the behavior. POV shows the learner a first person perspective video of a target task being completed (Clinton, 2015).

VSM uses video footage of the learner modeling a correct target behavior his/herself. It is used to strengthen skills, generalize the behavior to other settings, or to increase frequency (Clinton, 2015). VSM has been used successfully with students with Autism Spectrum Disorder (ASD) for teaching social-communication skills and functional skills (Bellini & Akullian, 2007).

Video Modeling and Reading Instruction

VM has been used to teach phonics, fluency, comprehension, and instructional strategies in the classroom (Ayala & O'Connor, 2013; Decker & Buggey, 2014; Hitchcock et al., 2004; O'Brien & Dieker, 2008).

Out of the five components identified by the National Reading Panel, fluency is the most researched in terms of VM. Decker and Buggey (2014) conducted a study comparing the effects of VSM and video peer modeling (VPM) on oral reading fluency of elementary students (age range of 8 to 12 years old) with SLD. A control group was also used in the study. Fluency is most commonly measured in words correct per minute (WCPM). For progress monitoring

purposes, students read a passage for three minutes and had their scores compared against norms that have been established for grades 1 through 8. The researchers thought that three-minute timings would give more accurate results for WCPM scores. Repetitions and self-corrections were counted as correct. Words read incorrectly, omitted, or told to the student by the adult were counted as errors. If a student paused for more than three seconds, the word was told to them. The number of words read correctly was then divided by three to calculate the student's WCPM. This procedure was used throughout the baseline, intervention, and maintenance phases of the study. The videos were made through an echo reading process. Students echoed the expression and accuracy of the researcher. The researcher was then edited out of the video, leaving an accurate and fluent reading performed by the student. During the intervention phase, students in the VSM group viewed their video once daily and students in the VPM group viewed a peer's video. Using a classroom peer ensured similarity (age, ability, and culture) between the model and viewer. The results showed an increase in fluency for both the VSM and VPM intervention groups between baseline and intervention phases. Two students in the VSM group made the biggest and most immediate gains. The gains continued or were maintained throughout the maintenance phases. The comparison group made gains, but they were slow and continuous as opposed to the spikes in the other two groups. It is possible that the gains in the intervention groups were made due to motivation from viewing imagery of success, and no real improvement were made.

Hitchcock and colleagues (2004) also studied the effects of VSM on reading fluency. Their study examined the effects on reading comprehension as well. Four first-grade students with reading delays were chosen from a rural Hawaii location. A six-phase single-subject design was used. They were (a) baseline, (b) tutoring to increase reading fluency, (c) tutoring plus video

self-modeling of reading fluency, (d) tutoring to increase reading comprehension, (e) tutoring plus VSM of reading comprehension, and (f) follow-up. In this study, reading fluency was also measured in WCPM. During the intervention phase for fluency the students watched an edited video of his or herself reading accurately and quickly. At the end of eight weeks, reading fluency doubled for three students and quadrupled for the fourth. This demonstrates the possible positive effects VSM has on reading.

Self-efficacy

In 1977, Albert Bandura introduced the idea of self-efficacy. He defined it as one's belief in one's ability to succeed in specific situations or accomplish a task. Self-efficacy is a component of the theoretical framework known as social cognitive theory. This theory suggests that human achievement depends on interactions between one's behaviors, personal factors (e.g. thoughts and beliefs), and environmental conditions (Bandura, 1986, 1977). Increasing self-efficacy is thought to improve academic skills such reading ability (Schunk, 2003).

Self-efficacy and academic learning. Self-efficacy plays a strong role in motivation and learning. It affects what a student chooses to do, how hard they work, if they persist, and if they achieve (Schunk, 2003). Schunk (2003) found that, "Compared with students who doubt their learning capabilities, those who feel efficacious for learning or performing a task participate more readily, work harder, persist longer when they encounter difficulties, and achieve at a higher level" (p. 160).

When a student is successful their efficacy raises and when they fail it lowers. Students will often compare themselves to others. When they observe a similar peer perform a task, they are more likely to believe they are capable of performing it too (Schunk, 1987). Positive feedback ("You can do this") can also raise efficacy. Modeling is another effective way of

promoting self-efficacy. Using models that are similar to the observer--in characteristics such as age, gender, ethnicity, and perceived competence--increases the likelihood of the observer producing comparable results (Schunk, 2003).

Modeling teaches and motivates students to learn and perform behaviors (Schunk, 2003). The observer believes they will be successful like the model if they replicate what they are doing. This is especially true when the observers have experienced difficulty or self-doubt about performing well (Schunk, 2003). This being said, peer models may be more desirable than teacher models and self-modeling may even be more desirable than peer modeling.

Self-efficacy and video modeling. In addition to improving reading skills, much of the research on video modeling discusses the positive effect that VSM has on self-image. As discussed above, self-image is critical to student success. Students were enthusiastic to watch themselves on video and had newfound motivation to read (Ayala & O'Connor, 2013). Viewing images of personal success may have contributed to a feeling that success was possible for students participating in VSM groups. Viewing similar peers succeeding may also have contributed to increased confidence. If self-efficacy, or the belief that one's ability to succeed at a specific task, is an effect of video modeling, it is definitely a welcome one (Decker & Buggey, 2014).

Purpose of Study

The literature suggests that more research needs to be done on VSM's effects on reading skills. The current research is promising, but still sparse. Reading is a skill that needs to be addressed quickly and consistently when students are struggling with it. The consequences of not learning to read are far too serious to waste time on interventions that are not proven effective.

Due to the time- and cost-efficiency of VSM, it is intervention worth looking into more extensively (Clinton, 2015).

Research Questions

This study was guided by three experimental questions:

1. What effects does VSM (independent variable) have on the reading fluency skills (dependent variable) of adolescent students with SLD?
2. What effects does VSM have on the self-efficacy perception on reading skills of adolescent students with SLD?
3. How do students' and teachers' perceive the social validity of the VSM intervention?

The first of the two questions is a demonstration experimental question, which seeks to answer how an independent variable (VSM) affects a dependent variable (reading fluency; Kennedy, 2005). The second question assesses the effects of VSM on the students' self-efficacy towards reading. The third question assesses social validity. This will be use used to assess the consumer's thoughts on the use of the intervention and how well they think it worked.

Methods

Participants and Setting

Four male students, given the pseudonyms Henry, Mark, Mario, and Andrew, were selected based on predetermined criteria. The criteria they needed to meet is as follows: (a) be enrolled in middle school (age 11-15 and grade 7-8); (b) be classified as having an SLD according to IDEIA 2004; (c) be below grade level in reading as defined by a Broad Reading standard score lower than 85 on the Woodcock Johnson IV Test of Achievement® (WCJIV Tests of Achievement) given as a pre-assessment for the study; (d) be recipients of special

education reading services; (e) have Full Scale Intelligence Quotient scores higher than 70 as determined by a standardized measure of cognitive ability; (f) be proficient English-speakers.

All students attended an urban public middle school in northern Utah in the Western United States. In 2015, the city had a population of 115,000. According to the October 1, 2016 count, the school district had a population of 17,000 and the middle school had a population of 1,000 students. The middle school serves grades 7 and 8. The research was conducted in a classroom or in the hallway outside the classroom at the school that the students are familiar with. The students worked individually with the teacher during class time while the other students were working independently or in the hallway.

None of the participants had utilized VSM procedures prior to the research study. Approval from the university and school district institutional review boards for research involving human participants was obtained. Student assent and parental consent was obtained before participation in the study. More information about each student follows.

Henry. At the time of the study, Henry was a 12-year-old, 7th grade student. According to the Wechsler Intelligence Scale for Children Fifth Edition® (WISC-V), Henry scored in the low average range with an IQ standard score equivalent of 86. His academic testing suggested that he would benefit from specialized reading instruction with a Broad Reading standard score of 71. His most recent reading Lexile score was a 615, which put his reading skills around a 3rd grade level. Henry also had goals on his IEP addressing his reading deficits.

Henry was in a 7th grade resource reading class that focused on comprehension skills and strategies. There were 12 students in the class. During the time of the research, the students were involved in a whole-class novel study. The students were required to read 100 minutes outside of class each week. Henry was also in a resource writing skills class that focuses on writing multi-

paragraph essays. During the time of the research, the class was working on writing argumentative essays.

Mark. Mark was a 12-year-old, 7th grade student. According to the WISC-V, Mark scored in the low average range with an IQ standard score equivalent of 88. His academic testing suggested that he would benefit from specialized reading instruction with a Broad Reading standard score of 82. His most recent reading Lexile score was a 416, which put his reading skills around a 2nd-3rd-grade level. Mark also had goals on his IEP addressing his reading deficits.

Mark was in a 7th grade resource reading class that focused on reading comprehension. As decided by his IEP team, he was also placed in a resource writing class. His class focused on argumentative writing during the time of the research.

Mario. Mario was a 12-year-old, 7th grade student. According to the Woodcock-Johnson V Tests of Cognitive Abilities® (WCJV Tests of Cognitive Abilities), Mario scored in the average range for intellectual ability with a standard score of 93. His academic testing suggested that he would benefit from specialized reading instruction with a Broad Reading standard score of 76. His most recent reading Lexile score was a 450, which put his reading skills around a 3rd grade level. Mario also had goals on his IEP addressing his reading deficits.

During the time of the study, Mario was in a 7th grade co-taught English class and a 7th grade resource reading support class. The co-taught class was a general education class taught by a general education English teacher and a special education teacher. The class had 35 students in it. Students were reading a novel outside of class and participating in book clubs in class. With their groups, they discussed the plot, analyzed themes, defined unfamiliar words, and made connections to the reading. The class was also working on writing argumentative essays. Mario's

reading support class had 16 students. This class was focused on reading comprehension strategies and grammar. The students in this class also worked on an independent reading intervention program on the computer.

Andrew. At the time of the study, Andrew was a 13-year-old, 8th grade student. According to the Wechsler Intelligence Scale for Children- Fourth Edition® (WISC-IV), Andrew scored in the low average range with an IQ standard score equivalent of 72. His academic testing suggested that he would benefit from specialized reading instruction with a Broad Reading standard score of 76. His most recent reading Lexile score was a 563, which put his reading skills around a 3rd grade level. Andrew also had goals on his IEP addressing his reading deficits.

While participating in this study, Andrew was in an 8th grade co-taught English class and an 8th grade resource reading support class. The co-taught class was a general education class taught by a general education English teacher and a special education teacher. The class had 34 students in it. Students were reading a novel outside of class and participating in book clubs in class. With their groups, they discussed a theme and analyzed the plot and characters in the novels. The class was also working on writing argumentative essays. Andrew's reading support class had 10 students. This class was focused on reading comprehension strategies and grammar. The students in this class also worked on an independent reading intervention program on the computer.

Materials

Materials used for all phases. For each session, two copies of each DIBELS Next® passage, a pen or pencil, and stopwatch were needed. One copy of the reading passages has the number of words marked vertically down the lines. The DIBELS Next® scoring booklets was

also be printed and used. Additionally, a copy of the DIBELS Next® Assessment Manual was printed and used by the scorer.

Materials used for intervention. Researchers filmed the participants reading with an iPad 2. Only the researcher needed to know how to use the iPad. Since the participants practiced reading until they sounded fluent, no video editing software was needed. During the intervention phase, the participants watched the video of themselves reading on the iPad. Description of the creation of the intervention videos is described in the procedures section.

Measures

Woodcock Johnson IV. The WCJIV Tests of Achievement® was used as the pre and post-assessment to measure any gains that participants made with reading abilities throughout the study. The assessment has been found reliable through internal consistency tests. The following are the coefficient alphas that were found for each cluster: (a) Reading=0.95; (b) Broad Reading=0.97; (c) Basic Reading Skills=0.95; (d) Reading Comprehension=0.93; (e) Reading Comprehension-Extended=0.96; (f) Reading Fluency=0.96; and Reading Rate=0.96.

DIBELS Next. The DIBELS Next® benchmark and progress monitoring passages for third and sixth grade were used to collect data on reading fluency. DIBELS Next® was selected as it offers many passages for each grade level. The three-form alternate form reliability coefficient for fourth grade DIBELS Next® Oral Reading Fluency (DORF) Words Correct is .95 and .85 for DORF Accuracy. The three-form alternate form reliability coefficient for sixth grade DORF Words Correct is .94 and .48 for DORF Accuracy.

Self-efficacy questionnaires. A 12-question self-efficacy questionnaire was given to each participant before and after the study. The students were asked questions about themselves as readers. For each statement, answer choices varied from “never like me” to “always like me.”

A two-question self-efficacy questionnaire was given to the participants to monitor their feelings about themselves as readers when they watched themselves read the same passage they were about to read out loud. For both questions, answer choices varied from "strongly agree" to "strongly disagree."

Interobserver agreement. All sessions throughout the study were videotaped. Another observer watched 30% of all three phases for each participant's videos to determine interobserver agreement. The second observer had the same materials as the first observer (DIBELS Next® DORF passage, pen/pencil, and stopwatch). They watched the video and used the same scoring procedures to determine the number of words read correct per minute and accuracy. For a study to be applicable and reputable, agreement between the two observers is necessary. A high interobserver agreement implies that if the study were to be replicated similar results would be yielded.

If both observers scored the same number of WCPM and accuracy then it was marked as an agreement. If there were differences in the scoring, it was be marked as a disagreement. Interobserver agreement was then be found by dividing the total number of agreements by the sum of the total number of agreements and total number of disagreements. That number was then multiplied by 100 to get a percentage of interobserver agreement (Kennedy, 2005). The sessions used for interobserver agreement where then averaged together to an overall interobserver agreement. Using this approach, interobserver agreement was reported at 100%.

Intervention fidelity. To implement the intervention with fidelity, a checklist was used each time by the researcher. This ensured that all participants got the same directions and that each session in a phase was comparable.

Social validity. It is important to determine if a study is socially appropriate and effective. Single-case studies are mostly objective and factual for replication and trustworthiness reasons. Social validity is a subjective measure used to determine if an intervention is well received by participants. It helps researchers determine if a treatment is accepted and will be used in the future (Wolf, 1978; Carter, 2010).

Social validity was assessed using a questionnaire that was given to the participating students and teacher at the conclusion of the maintenance phase. Participants were asked about their feelings regarding watching themselves on video, who they told about getting filmed, and questions regarding self-efficacy. Teachers were asked about their feelings of using the videos as an intervention to determine if they thought it was time-effective and worthwhile. The questionnaire was given in a short answer format. Answers were analyzed qualitatively to determine students' perceived effects of the intervention.

Procedures

Pre/post assessment. After the participants were recruited, the WCJIV Tests of Achievement® Form A reading tests (1, 4, 7, 8, 9, 12, 15, 17) were administered by the researcher to each student to establish baseline reading abilities. The fluency test results were used to help determine which grade level to have each student read at during the experiment. The researcher administered Form B of these tests at the end of the study to detect any improvements in reading abilities.

A self-efficacy questionnaire was given to each participant after finishing the WCJIV Tests of Achievement® testing. Students were read the questions by the researcher and asked to circle the answer the best described them. The same questions were asked on the pre- and post-assessment.

Familiar passage. A passage was randomly selected to be used as the familiar passage (Griffiths, VanDerHeyden, Skokut, & Lilles, 2009). Each participant read this passage every sixth session. This was also the passage that was used to create the intervention video.

Baseline phase. To determine what grade level students were going to be tested on for all phases of the research study, the researched followed the DORF administration and scoring guidelines. The students were asked to read a passage on their reading fluency grade level as determined by the WCJIV Tests of Achievement®. The students were asked to read three passages on that grade level. If the median accuracy score was 95%, then that was the grade level chosen for them to be tested at for the study. If the median accuracy score was less than 95%, the students were then asked to read three passages on the grade level below. If the median accuracy score was higher than 95%, then the students were asked to read three passages on the grade level above. For three participants, the initial grade level chosen was the appropriate level. One participant went up two grade levels during this surveying. 95% was chosen as this is the accuracy percentage of independent reading levels, which is the appropriate level for to conduct fluency instruction at (Lee & Yoon, 2017).

The researcher followed the baseline fidelity checklist, which is adapted from DORF administration and scoring guidelines. Researchers collected data on words correct per minute (WCPM) and accuracy (number of words read correctly divided by total number of words read times 100). The scores where graphed by the researcher for visual analysis. Students were ready to advance to the intervention phase as soon as stable trend was observed during visual analysis of data.

Intervention videos. To prepare for the intervention phase, a video was made for the participant. The researcher told the participant they were going to videotape them reading. The

student was given a copy of the familiar passage and they were asked to follow along as it was read aloud to them. The researcher read as many words as the highest number of words read by the participant during baseline, finishing any sentences if that number fell mid-sentence. Then the researcher asked the participant to read the passage aloud with them to the spot they read to before. The student was then asked to read the passage independently with the researcher correcting any words they mispronounced and having them repeat the word. The researcher had the participant read the passage as many times they needed to until they could read it fluently. At this point, the researcher filmed the student reading. The participant was allowed to watch the video and decide if they liked the video or wanted to make a new one. Once the participant approved of their video, it was saved and used for the VSM component of the intervention.

Intervention phase. When other students in the class were working independently the participant was asked to come up the teacher's desk or taken into the hallway if an aide was present to watch their video and read a passage. The researcher followed the intervention fidelity checklist, which was adapted from DORF administration and scoring guidelines. Participants read passages at the same level that they did during baseline. Continuing from baseline, the familiar passage was read every sixth session. A two-question self-efficacy questionnaire was given to the student each time they read the familiar passage during the intervention phase. The researcher again collected data on WCPM and accuracy by following the DIBELS Next® administration and scoring guidelines. The scores were graphed for visual analysis. The analysis determined if there was a functional relationship between the independent and dependent variable. The intervention was terminated as soon as stable trend was observed.

Maintenance phase. Starting three weeks after the last intervention session, maintenance data was collected once per week. This was collected following the same format as the baseline

phase in which the participant did not have access to the intervention video. Each participant read the familiar passage once during maintenance. This phase was done to determine if the performance gains made during the intervention phase were maintained over time.

Research Design

Multiprobe multiple baseline across participants design. To determine whether or not a functional relationship existed between the independent and dependent variable, a multiprobe multiple baseline across participants design was used. Horner and Baer (1978) first introduced multiprobe multiple baseline design as way of increasing the efficiency of the multiple baseline design.

In a multiple baseline design, data points are taken for each session in each tier of the design. The multiprobe multiple baseline design increases efficiency by intermittently collecting data during the experiment. This saves time for the researcher and lowers the amount of effort needed to record and score observational sessions (Kennedy, 2005).

One baseline data point was collected for each participant at the beginning of this study. Baseline was continued for participant one. When a stable trend was reached for the first participant, a baseline data point was collected for the other three participants. Then participant one received the intervention and data was collected until it was again stable. At the conclusion of the intervention phase for participant one, a baseline data point was collected for participants two, three, and four. Baseline data collection was continued for participant two and the pattern described above was repeated until all participants showed a steady trend with low variability. At least three consecutive baseline data points were collected before each participant was given the intervention.

Maintenance sessions were started three weeks after the intervention had been terminated for each participant to determine if there was maintenance of the behavior over time. This evaluates the long-term effects of the intervention.

Data analysis. Words correct per minute and reading accuracy were graphed for each participant. The graphs created a visual that was analyzed daily to determine changes in trend, level, and variability. The means of WCPM and accuracy for each phase for each participant were also calculated. The objective of this study was to establish whether there was a functional relation between the VSM intervention and reading fluency (WCPM and accuracy). Replication of the intervention of the study across four participants was used to attempt to establish a functional relation.

Results

A multiprobe multiple baseline across four participants design was used to evaluate the effects of a VSM intervention on reading fluency skills of middle school age students with learning disabilities. Effects of the VSM intervention were also evaluated in terms of self-efficacy perception on reading skills.

Words Correct Per Minute

Only one of the four students increased their mean number of WCPM during the intervention phase. As seen in Figure 1, Mark, Mario, and Andrew read significantly more words on the familiar passage during intervention.

Henry. Henry's data stayed somewhat stable throughout all three phases. During baseline, Henry read between 135 and 187 WCPM with a mean of 157.5 WCPM. During intervention, he read between 121 and 174 WCPM with a mean of 148.4 WCPM. During maintenance, he read between 122 and 177 WCPM with and mean of 150 WCPM.

He read the familiar passage twice during baseline. He read 169 and 187 WCPM respectively. During intervention, he read it once and read 174 WCPM. He read it once during maintenance and read 177 WCPM.

Mark. Mark's data stayed stable throughout all three phases with increases during the intervention and maintenance phases when he read the familiar passage. Mark read between 95 and 126 WCPM during baseline with a mean of 111 WCPM. During intervention, he read between 67 and 142 WCPM with a mean of 96.1 WCPM. During maintenance, he read between 102 and 149 WCPM with and mean of 121 WCPM.

He read the familiar passage once during baseline. He read 111 WCPM. During intervention, he read it once and read 142 WCPM. He read it once during maintenance and read 149 WCPM.

Mario. Mario's data also stayed stable throughout all three phases with increases during the intervention and maintenance phases when he read the familiar passage. During baseline, Mario read between 100 and 116 WCPM with a mean of 108.1 WCPM. During intervention, he read between 69 and 144 WCPM with a mean of 102 WCPM. During maintenance, he read between 104 and 152 WCPM with and mean of 123.3 WCPM.

He read the familiar passage twice during baseline. He read 114 and 116 WCPM respectively. During intervention, he read it once and read 144 WCPM. He read it once during maintenance and read 152 WCPM.

Andrew. Andrew's data was similar to Mark and Mario's as his data stayed stable throughout all three phases with increases in WCPM when the familiar passage was read. Andrew read between 85 and 116 WCPM during baseline with a mean of 97.6 WCPM. During

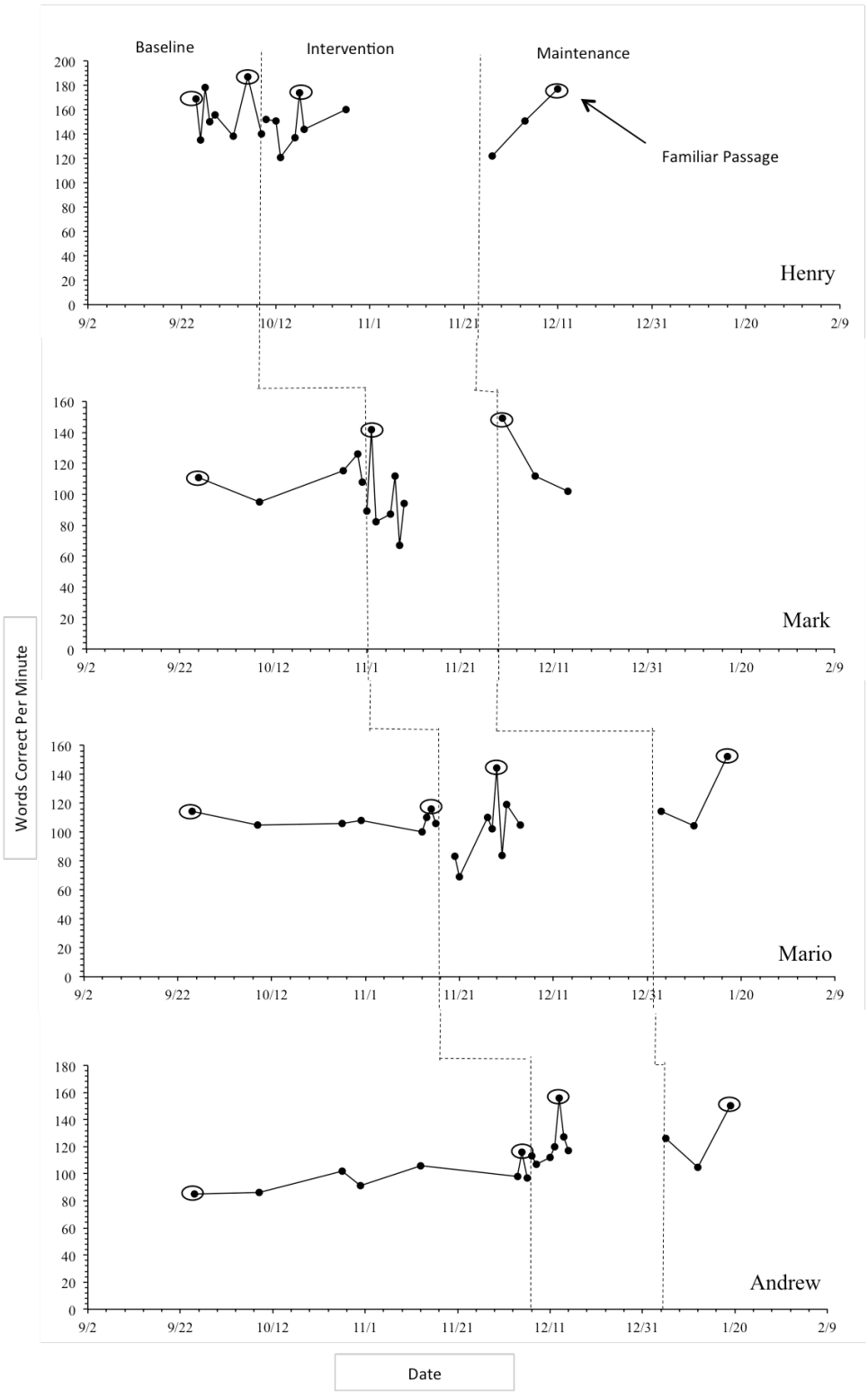

Figure 1. Graph of intervention results regarding VSM intervention and WCPM for four middle school students with SLD.

intervention, he read between 107 and 156 WCPM with a mean of 121.7 WCPM. During maintenance, he read between 105 and 150 WCPM with and mean of 127 WCPM.

He read the familiar passage twice during baseline. He read 85 and 116 WCPM respectively. During intervention, he read it once and read 156 WCPM. He read it once during maintenance and read 150 WCPM.

Accuracy

Two of the participants increased their mean accuracy scores during intervention phase. As seen in Figure 2, all four participants increased their accuracy on the familiar passage; three of them increased their accuracy significantly. Two of the participants read the familiar passage with a higher accuracy (100%) during maintenance than intervention.

Henry. Henry's graphs showed increases in accuracy from baseline to intervention. During maintenance, his accuracy percentage again went down for the first data point and then steadily increased over the last two. Henry read with accuracy percentages between 90% and 95.7% during baseline with a mean of 93.3%. During intervention, he read with accuracy percentages between 96% and 99.4% and a mean of 96.9%. During maintenance, he read with accuracy percentages between 90.4% and 97.8% and a mean of 94.2%

He read the familiar passage with 94.9% and 90.8% accuracy during baseline. He read it with 99.4% accuracy during intervention and 97.9% accuracy during maintenance.

Mark. According to the graph, Mark's accuracy stayed somewhat stable across all three phases. Mark read with accuracy percentages between 95% and 100% during baseline with a mean of 97.7%. During intervention, he read with accuracy percentages between 93.1% and 98.9% and a mean of 97.3%. During maintenance, he read with accuracy percentages between 99% and 100% and a mean of 99.7%

He read the familiar passage with 97.4% accuracy during baseline. He read it with 97.9% accuracy during intervention and 100% accuracy during maintenance.

Mario. Mario's graph shows that his accuracy percentages also stayed somewhat stable except for increases when he read the familiar passage during the intervention and maintenance phase. Mario read with accuracy percentages between 95.5% and 98.1% during baseline with a mean of 96.9%. During intervention, he read with accuracy percentages between 93.2% and 99.3% and a mean of 96.7%. During maintenance, he read with accuracy percentages between 95.8% and 100% and a mean of 97.7%

He read the familiar passage with 97.4% and 95.9% accuracy during baseline. He read it with 99.3% accuracy during intervention and 100% accuracy during maintenance.

Andrew. Andrew's graph showed a variable trend until halfway through the intervention phase when the data became more stable. Andrew read with accuracy percentages between 97.7% and 94.3% during baseline with a mean of 96.7%. During intervention, he read with accuracy percentages between 96.4% and 100% and a mean of 99%. During maintenance, he read with accuracy percentages between 97.2% and 99.3% and a mean of 98.6%

He read the familiar passage with 97.7% and 94.3% accuracy during baseline. He read it with 99.4% accuracy during intervention and 99.3% accuracy during maintenance.

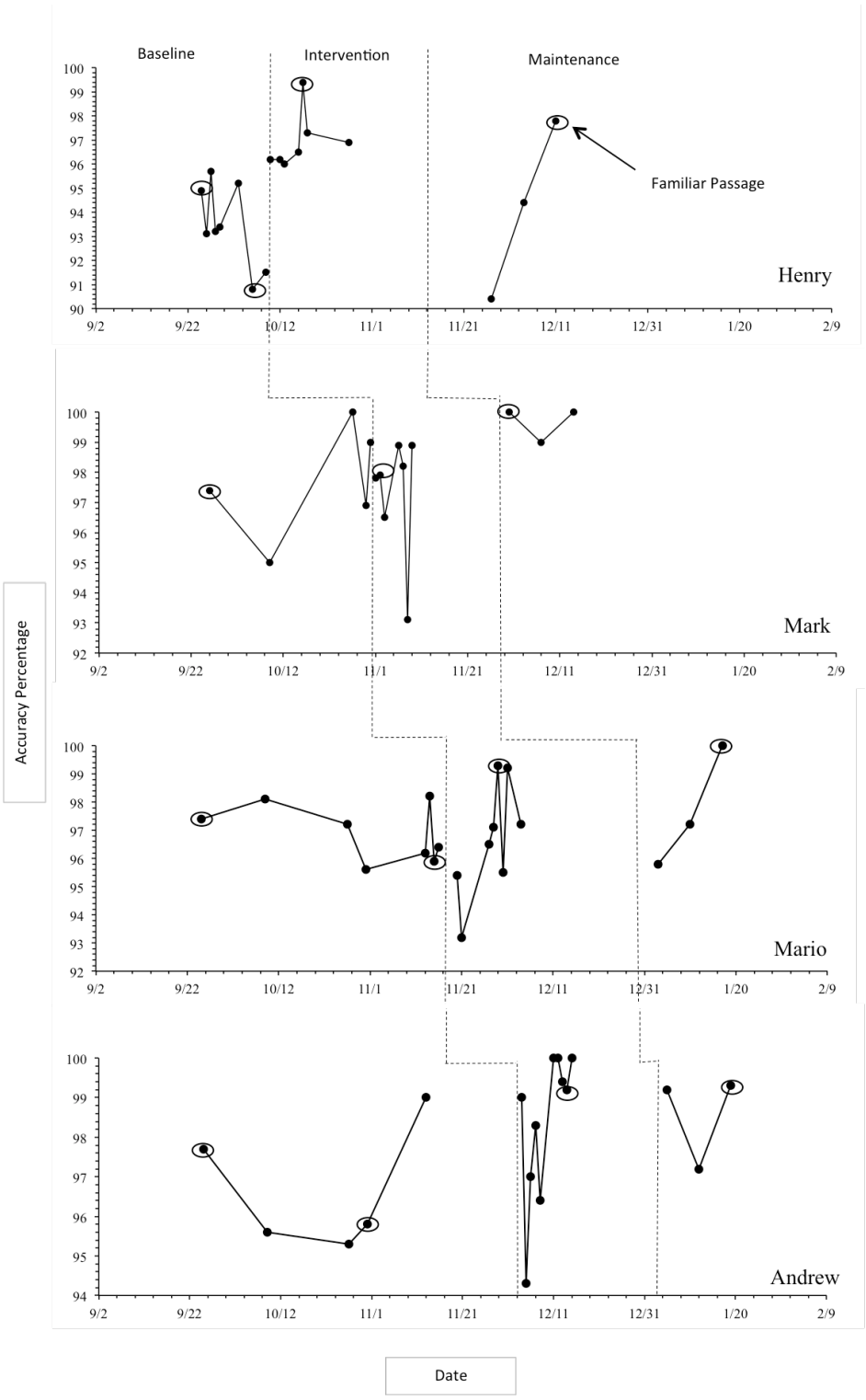

Figure 2. Graph of intervention results regarding VSM intervention and accuracy for four middle school students with SLD.

Self-efficacy

Students were given a 12-question pre- and post-assessment in the form of a Likert Scale to measure self-efficacy perceptions towards reading. They were also given two-question assessment also in the form of a Likert Scale after watching themselves read the familiar passage and then reading it. The statements read, "I am a good reader" and "Watching a video of myself read helps me read better."

Henry. Henry answered five out of twelve questions differently after the data collection. On the pre-assessment he responded to the statement, "I am a very good reader," with, "Often like me." He responded to the same statement with the answer, "Sometimes like me," during the post-assessment. He changed his answer from, "Sometimes like me," to, "Almost never like me," for the statement, "I read a lot of books." During the pre-assessment he responded by saying that he could never change how good he was at reading to almost never. His response for, "I do not like to spend time reading," changed from, "Almost never like me," to, "Never like me." And his answer for, "I can read hard books," changed from, "Most of the time like me," to, "Sometimes like me." During the intervention phase, Henry answered, "Neutral," to both statements after watching his video and reading the familiar passage.

Mark. Mark's answers changed for three of the twelve questions during the post assessment. His answer to the statement, "I only read when I have to," changed from, "Often like me," to, "Almost never like me." His answer to the statement, "I am a very good reader," changed from, "Most of the time like me," to, "Often like me." Mark answered that he is sometimes the best reader in his English class during the pre-assessment and that he is often the best reader during the post-assessment. During the intervention phase, Mark answered, "Agree," to both statements after watching his video and reading the familiar passage.

Mario. Mario answered eight questions out of twelve differently during the post-assessment. Four of his answers indicated that he feels he is a better reader and four of them did not. For example, his answer changed from, “Most of the time like me,” to, “Always like me,” for the statement, “I believe that practice will help my reading.” But his answer to, “I can’t change how good I am at reading,” changed from, “Almost never like me,” to, “Sometimes like me.” During the intervention phase, Mario answered, “Neutral,” to the first statement and, “Agree,” after watching his video and reading the familiar passage.

Andrew. Andrew answered four out of twelve questions differently during the post-assessment. His answer for, “For me it is fun to read,” went from, “Most of the time like me,” to, “Often like me.” He answered, “Always like me,” to the statement, “I am a very good reader,” during the pre-assessment, and answered “Most of the time like me,” during the post-assessment. For the statement, “I read a lot of books,” his answers went from, “Often like me,” t o, “Sometimes like me.” And for the statement, “I am one of the best readers in my English class,” his answer went from, “Sometimes like me,” to, “Almost never like me.” During the intervention phase, Andrew answered, “Agree,” to the first statement and, “Neutral,” after watching his video and reading the familiar passage.

WCJIV Scores

Participants’ reading abilities were tested using the WCJIV Tests of Achievement® before and after the study. Scores are reported in grade equivalents (GE). The data is summarized in Table 1.

Table 1

WCJ-IV Pre and Post-Assessment GE Scores

	Reading		Broad Reading		Basic Reading Skills		Reading Comprehension		Reading Comprehension Extended		Reading Fluency		Reading Rate	
Participant	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Henry	2.4	**2.6**	3.2	3.1	1.3	**2.5**	2.8	2.3	2.8	2.7	3.9	3.6	4.0	3.8
Mark	3.4	**4.4**	3.2	**4.2**	3.4	**3.7**	2.3	**3.8**	2.5	**3.8**	3.0	**4.2**	3.0	**4.3**
Mario	2.7	**2.8**	3.4	**3.9**	2.3	**2.9**	3.7	3.4	3.1	**3.3**	3.7	**5.1**	4.6	**6.2**
Andrew	3.8	**5.4**	3.7	**5.4**	5.3	**7.3**	3.2	**4.0**	3.7	**4.6**	4.1	**6.1**	4.2	**5.5**

Note: Bolded numbers show increase from pre-test.

Social Validity

A qualitative measure of social validity was used to determine if the teacher and students felt that the VSM intervention was beneficial. The participants were given a short-answer questionnaire asking them about their thoughts, feelings, and perceptions of the intervention. It took about 5 minutes to complete. Students dictated their answers and the researcher scribed.

Three of the four participants said that the VSM intervention helped them read better. The fourth said that it helped him a little bit. Mario said, “The video sometimes made me nervous, but usually it made me better. It helped me concentrate and read more words.” He also said, “After I watched my video, I got more into reading and I can read faster.” Two participants said they would like to watch more videos of themselves reading. The other two said that they might. Henry told his brother about being videotaped, and the other students did not tell anyone.

The teacher reported that the VSM intervention worked better for some students than others. She thinks that some of the students felt that they had to watch the video too many times. She felt that the VSM intervention worked best when the students watched themselves read the passage they were about to read after. The teacher thinks it is important for students to see themselves read because awareness is key to knowing how to improve. The teacher would be willing to use more VSM interventions in her classes to help improve reading fluency skills.

Discussion

The purpose of this research was to determine if a VSM intervention would increase reading fluency skills. Data collected on WCPM and accuracy from the study showed that there might be a positive relationship between VSM and reading fluency, specifically when students watch themselves read the same passage they are about to read. Mark read 31 more words on the familiar passage during intervention and 38 more during maintenance. Mario read 28 more words during intervention and 36 more during maintenance on the familiar passage. Andrew read 40 more words on the familiar passage during intervention and 34 during maintenance. All four participants read the most words while reading the familiar passage during intervention.

Three out of four students increased their reading fluency scores as measured by the WCJIV Tests of Achievement® pre- and post-assessment. Mark increased by 1.2 grades levels on the post-assessment. Mario increased by 1.4 grade levels. Andrew increased the most with an increase of 2.0 grade levels. These three students also increased their reading rates.

Other significant results from the pre- and post-assessment are that Andrew increased his reading level from a 3.8 grade level to a 5.4 grade level. He improved his basic reading skills from a 5.3 grade level to a 7.3 grade level. These are huge gains considering the study was completed in less than four months. There could be unknown variables that contributed to these increases.

There has been limited research done on VSM's effects on reading fluency. Hitchcock and colleagues (2004) researched the effects of a VSM intervention on reading fluency and comprehension. This study was done with first-grade students. The results showed that after the intervention students' reading fluency in terms of WCPM doubled for three students and quadrupled for the fourth. Decker and Buggey (2014) compared the effects of VPM and VSM on

reading fluency of elementary students. In this study students read passages for three minutes. Both intervention groups showed improvement from baseline to intervention, but the students in the VSM group showed the quickest and biggest gains.

This research was also done to study the effects of VSM on self-efficacy towards reading in students with SLD. The results are inconclusive on whether the VSM intervention had an effect.

Schunk (2003) showed that an increase in self-efficacy could increase academic achievement and reading ability. He also found that students self-efficacy increased the most when they watched successful models who were similar to themselves. Ayala and O'Connor (2013) studied a VSM intervention's effects on phonic skills of elementary students. They found that students were excited to watch their videos and had more motivation to read.

The results of this study are useful as reading interventions are desperately needed for adolescent students with SLD. This study is also an extension of the limited research done on VSM as a reading intervention.

Limitations

One limitation in this study is the sample size. Only four participants were used in this study. It is hard to extend the results to other students with SLD. Different personalities may enjoy watching themselves on videotape more than others.

A second limitation is the passage variability with DIBELS®. It was apparent during data collection that some passages seemed unusually easy for the participants and some unusually hard, even though the same level was used throughout the study for each student. This most likely stems from the fact that students have previous knowledge of different words. A student may know a word that would be considered difficult for their reading fluency level due to

being previously introduced to it. On the other hand, they might be unfamiliar with a word that most students on their reading fluency grade level generally know. This is again due to their personal knowledge of different words.

A third limitation is that the four participants, although poor readers for their grade, generally read over 100 WCPM. If slower readers had been used, the intervention may have had more of an impact due to their being more room for improvement.

Suggestions for Future Research

Replication of this study should involve female students, students of other ages, and students with different disabilities. Female students might respond differently to watching themselves on video, as might students of different ages. Younger students might enjoy watching themselves on video better than middle school aged students. The intervention may have a bigger impact on students with other disabilities.

Future research studies may want to consider using videos with different lengths. One minute video recordings were used in this study and the students seemed to tire from watching that long of a video every time. A shorter video may be more effective and have the same or better results.

A way to eliminate passage variability would be to pre-screen reading selections with each participant. The participants would read a variety of passages in search of ones that they read at similar fluency levels (WCPM and accuracy). Each participant would then have an individualized set of passages that would make it easier to measure the effects of the intervention on reading fluency skills.

Self-graphing as a form of self-monitoring might be another valuable component that could be included with the study as is. This added intervention might increase student motivation and accountability towards their reading fluency skills.

VSM should also be studied in terms of its effects on the other reading components. There have already been successful studies with VSM with phonics and comprehension instruction.

VSM could also be studied in comparison to repeated reading interventions. It would be beneficial to see which intervention improves student's reading fluency the quickest. This could be done in an alternating treatment design.

Implications for Practice

This research is an example of how technology, specifically an iPad, can be used to implement interventions and differentiate instruction in the classroom. Students could be taught to videotape themselves and access the videos prior to reading on their own. This could promote independence and ownership of learning, both essential skills if students are to be successful in adulthood. Classroom aides could also be trained on how to help students create the videos.

Students need instruction in all five areas of reading to be successful (National Reading Panel, 2000). Teachers could incorporate VSM in teaching phonemic awareness, phonics, vocabulary, and comprehension in addition to fluency.

Conclusion

The ability or inability to read has a huge impact on the current and future lives of students. Too many students are unable to close the reading gap once they enter middle and high school. This means that more than ever adolescent students with SLD are in dire need of interventions to increase reading skills. This study shows that having students watch videos of

themselves read, especially if they watch the same passage they will read afterwards, is easy to implement, cost-effective, and worth looking into more.

References

Ayala, S. M., & O'Connor, R. (2013). The effects of video self-modeling on the decoding skills of children at risk for reading disabilities. *Learning Disabilities Research & Practice*, *28*(3), 142-154. doi: 10.1111/ldrp.12012

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. doi: 10.1037/0033-295X.84.2.191

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology, 4*(3), 359-373.

Bellini, S., & Akullian, J. (2007). A meta-analysis of video modeling and video self-modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children*, *73*(3), 264-287. doi: 10.1177/001440290707300301

Carter, S. L. (2010). *The social validity manual: A guide to the subjective evaluation of behavior interventions.* London, England: Academic Press.

Chard, D. J., Vaughn, S., & Tyler, B. J. (2002). A synthesis of research on effective interventions for building reading fluency with elementary students with learning disabilities. *Journal of Learning Disabilities, 35*(5), 386-406. doi: 10.1177/00222194020350050101

Clinton, E. (2015). Using video modeling to teach academic skills to students with disabilities: A review of the literature. *International Journal of Advanced Research*, *1*(11), 382-390.

Cortiella, C., & Horowitz, S. H. (2014). *The state of learning disabilities: Facts, trends and emerging issues.* New York, NY: National Center for Learning Disabilities.

Decker, M. M., & Buggey, T. (2014). Using video self-and peer modeling to facilitate reading fluency in children with learning disabilities. *Journal of Learning Disabilities*, *47*(2), 167-177. doi: 10.1177/0022219412450618

Good, R. H., Kaminski, R. A., Cummings, K., Dufour-Martel, C., Petersen, K., & Powell-Smith, K. (2011). *DIBELS Next Assessment Manual*. Eugene, OR: Dynamic Measurement Group.

Griffiths, A. J., VanDerHeyden, A. M., Skokut, M., & Lilles, E. (2009). Progress monitoring in oral reading fluency within the context of RTI. *School Psychology Quarterly*, *24*(1), 13.

Hitchcock, C. H., Prater, M. A., & Dowrick, P. W. (2004). Reading comprehension and fluency: Examining the effects of tutoring and video self-modeling on first-grade students with reading difficulties. *Learning Disability Quarterly*, *27*(2), 89-103. doi: 10.2307/1593644

Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baseline. *Journal of Applied Behavior Analysis*, *11*(1), 189-196. doi: 10.1901/jaba.1978.11-189

Individuals with Disabilities Education Improvement Act. (2004) Pub. L. No. 108-446, § 602, 118 Stat. 2657-2658.

Kennedy, C. H. (2005). *Single-case designs for educational research*. Boston, MA: Pearson Education, Inc.

Lee, J., & Yoon, S. Y. (2017). The effects of repeated reading on reading fluency for students with reading disabilities: A meta-analysis. *Journal of Learning Disabilities*, *50*(2), 213-224. doi: 10.1177/0022219415605194

Musti-Rao, S., Hawkins, R. O., & Barkley, E. A. (2009). Effects of repeated readings on the oral reading fluency of urban fourth-grade students: Implications for practice. *Preventing School Failure: Alternative Education for Children and Youth*, *54*(1), 12-23. doi: 10.3200/PSFL.54.1.12-23

National Assessment of Educational Progress. (2015). *Reading and mathematics grade 4 and 8 national results*. Retrieved from https://www.nationsreportcard.gov/reading_math_2015/#?grade=4

National Institute for Literacy. (1997). *Literacy: It's a whole new world*. Washington, DC: Author.

National Reading Panel (US), National Institute of Child Health, & Human Development (US). (2000). *Report of the national reading panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. National Institute of Child Health and Human Development, National Institutes of Health.

O'Brien, C., & Dieker, L. A. (2008). Effects of video modeling on implementation of literature circles in inclusive content area classrooms. *Journal of Curriculum and Instruction*, *2*(2), 52-73.

Schrank, F. A., Mather, N., & McGrew, K. S. (2014). *Woodcock-Johnson IV Tests of Achievement.* Rolling Meadows, IL: Riverside.

Schunk, D. H. (1987). Peer models and children's behavioral change. *Review of Educational Research*, *57*(2), 149-174. doi: 10.3102/00346543057002149

Schunk, D. H. (2003). Self-efficacy for reading and writing: Influence of modeling, goal setting, and self-evaluation. *Reading & Writing Quarterly, 19*(2), 159-172. doi: 10.1080/10573560308219

Taber-Doughty, T., Bouck, E. C., Tom, K., Jasper, A. D., Flanagan, S. M., & Bassette, L. (2011). Video modeling and prompting: A comparison of two strategies for teaching cooking

skills to students with mild intellectual disabilities. *Education and Training in Autism and Developmental Disabilities*, *46*(4), 499-513.

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, *11*(2), 203-214. doi: 10.1901/jaba.1978.11-203

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology*, *25*(1), 82-91. doi: 10.1006/ceps.1999.1016

APPENDIX A

Literature Review

A review of literature suggests that many students with specific learning disabilities are struggling academically, especially with literacy skills. It also suggests that video self-modeling may be an effective remedial intervention.

Specific Learning Disabilities

The Individuals with Disabilities Education Improvement Act (IDEIA; 2004) defines SLD as a language disorder that manifests itself in the "imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations" (p. 12-13). Learning disabilities are caused by neurological differences in brain structure and chemistry. These differences can interfere with receiving, storing, processing, retrieving, or communicating information (IDEIA, 2004). Individuals with SLD may experience low self-esteem, set low expectations for themselves, struggle with underachievement and underemployment, and have fewer friends (Cortiella & Horowitz, 2014).

Main Components of Reading Instruction

In 1997, Congress asked the National Institute of Child Health and Human Development and the U.S. Department of Education to form the National Reading Panel. The panel's task was to review research on how children learn to read and determine the most effective methods of teaching reading. They identified five components that need to be addressed in reading instruction (National Reading Panel, 2000).

The first of the five components is phonemic awareness. A phoneme is the smallest unit of sound in a word. For example, the word dog is made up of three phonemes or sounds: /d/ /o/

and /g/. Phonemic awareness is the knowledge that words are made up of a combination of different sounds. It also is the ability to blend and segment the sounds.

Phonics is the second component. Phonics teaches children that there is relationship between phonemes and printed letters. For example, students learn that the letter b represents the sound /b/, and that is it the first letter in the word such as boy, boat, and bug. Students also start to learn and recognize spelling patterns.

The third component is fluency. Fluency is the ability to read accurately and quickly. Fluent readers use expression, intonation, and have natural pacing. Improving fluency means a child is moving from decoding to sight-reading. Less energy is spent on deciphering words and more is spent on comprehending what is being read.

Vocabulary is the fourth component. Not every word needs to be known to understand a text, but if there are too many new words comprehension of a text will be nearly impossible. Indirect and direct vocabulary instruction is needed. Students should be exposed multiple times to help them solidify their understanding of new words.

The fifth and final component is comprehension. This is the main goal of reading. It is the interaction between the reader and text. Good readers use a variety of strategies to actively engage in what they are reading. Learning to read is a combination of all five components (National Reading Panel, 2000).

Students with learning disabilities often have difficulties with reading fluency, which in turn leads to difficulties with reading comprehension (Musti-Rao, Hawkins, & Barkley, 2009). If students are spending too much time processing words, there is little room left in the working memory to think about the text as a whole. In students with SLD the working memory is

primarily focused on word-level processing preventing understanding at the content-level (Chard, Vaughn & Tyler, 2002).

A student with a SLD evident in reading fluency difficulties will exhibit labored reading. They may read slowly, pause often, and seem disconnected to the text. Their accuracy, reading words correctly, may also be poor (Chard et al., 2002).

Reading fluency is an essential skill for all students to master, but students with SLD often need extra support to do so. Unfortunately, fluency is often a neglected aspect of reading programs. This could be due to the fact that there are not many well-known effective interventions. The evidence-based practices of video modeling (VM) and self-graphing have shown promises as means of increasing reading fluency of students with SLD.

Video Modeling

The intervention of VM is emerging as a cost- and time-efficient intervention for students with disabilities. VM involves showing a student a model demonstrating the correct performance of a target behavior via video format (Bellini & Akullian, 2007). VM has been widely researched when used for social and functional skill development. Research is increasingly being conducted on VM and its effects on academic skills of learners with disabilities (Clinton, 2015).

There are several variations of VM that have been identified in literature. One variation is video modeling other (VMO). This involves video footage of someone other than the participant (adult or peer) correctly engaging in the behavior. It has also been referenced as video peer modeling (VPM). It is used for teaching new skills (Clinton, 2015).

Point-of-view video modeling (POV) is another version. This shows the learner a first person perspective video of a target task being completed. This allows the viewer to see the task being completed as if they were engaging in it. It is typically used for teaching fine motor

movements. Since it removes stimuli from the video, it has also been used for students who are easily distracted (Clinton, 2015). The uses of VMO and VSM as literacy interventions are beginning to be studied.

Another type is video self-modeling (VSM). VSM uses video footage of the learner modeling a correct target behavior his/herself. It is used to strengthen skills, generalize the behavior to other settings, or to increase frequency (Clinton, 2015). VSM has been used successfully with students with Autism Spectrum Disorder (ASD) for teaching social-communication skills and functional skills (Bellini & Akullian, 2007).

Video Modeling and Reading Instruction

Video modeling and phonics. Ayala and O'Connor (2013) performed a study on the effects VSM has on phonics. The VSM intervention focused on improving decoding skills and sight word recognition. Ten first grade students who were at risk for reading disabilities were chosen to participate in the study. All of them had responded poorly to a Tier 2 reading intervention in a response to intervention (RTI) model. The students were coached and recorded blending and segmenting decodable words and reading sight words. Videos were edited so that the tutor was not seen or heard. The student was shown demonstrating perfect blending and segmenting of the sounds and reading of sight words. Students viewed their videos a minimum of four times a week prior to working in reading groups. Results showed an increase in decoding skills and sight word recognition for all participants. A maintenance post-test was done two weeks later and showed retention or increases for 70 percent of participants. The study shows promising results for the future of VSM and phonics interventions.

Marcus and Wilder (2009) compared VPM and VSM in a study that was aiming to teach three children with autism to identify novel letters. Greek and Arabic letters were used to ensure

that prior knowledge did not play a role. A multiple baseline and multielement design was used. The results showed that only one participant reached the criterion in the peer-modeling condition, while all three reached criterion in the self-modeling condition. The participant that reached criterion in both conditions reached it more quickly through VSM. The participants enjoyed watching themselves on video.

Video modeling and fluency. Out of the five components identified by the National Reading Panel, fluency seems to be the most researched in terms of video modeling. Decker and Buggey (2014) conducted a study comparing the effects of video self-modeling and video peer modeling on oral reading fluency of elementary students (age range of 8 years 7 months to 12 years 1 month) with learning disabilities. A control group was also used in the study. Fluency is most commonly measured in words correct per minute (WCPM). For progress monitoring purposes, students read a passage for three minutes and had their scores compared against norms that have been established for grades 1 through 8. The researchers thought that three-minute timings would give more accurate results for WCPM scores. Repetitions and self-corrections were counted as correct. Words read incorrectly, omitted, or told to the student by the adult were counted as errors. If a student paused for more than three seconds, the word was told to them. The number of words read correctly was then divided by three to calculate the student's WCPM. This procedure was used throughout the baseline, intervention, and maintenance phases of the study. The videos were made through an echo reading process. Students echoed the expression and accuracy of the researcher. The researcher was then edited out of the video, leaving an accurate and fluent reading performed by the student. During the intervention phase, students in the VSM group viewed their video once daily and students in the VPM group viewed a peer's video. Using a classroom peer ensured similarity (age, ability, and culture) between the model

and viewer. The results showed an increase in fluency for both the video self-modeling and video peer modeling intervention groups between baseline and intervention phases. Two students in the VSM group made the biggest and most immediate gains. The gains continued or were maintained throughout the maintenance phases. The comparison group made gains, but they were slow and continuous as opposed to the spikes in the other two groups. It is possible that the gains in the intervention groups were made due to motivation from viewing imagery of success, and no real improvement were made.

Hitchcock, Prater, and Dowrick (2004) also studied the effects of video self-modeling on reading fluency. Their study examined the effects on reading comprehension as well. Four first-grade students with reading delays were chosen from a rural Hawaii location. A six-phase design was used. They were (a) baseline, (b) tutoring to increase reading fluency, (c) tutoring plus video self-modeling of reading fluency, (d) tutoring to increase reading comprehension, (e) tutoring plus VSM of reading comprehension, and (f) follow-up. In this study, reading fluency was also measured in WCPM. During the intervention phase for fluency the students watched an edited video of his or herself reading accurately and quickly. At the end of eight weeks, reading fluency doubled for three students and quadrupled for the fourth. This is further proof of the possible positive effects VM has on reading.

Video modeling and comprehension. The second part of Hitchcock and colleague's (2004) study investigated the effects of tutoring and video self-modeling on reading comprehension. For this intervention, the students watched videos of his or herself successfully applying a story map and answering comprehension questions. Studies show that students struggling with comprehension need direct instruction in cognitive strategies to help them improve. In the study, reading comprehension was measured in correct number of responses out

of 15. Reading comprehension for all four participants reached pre-established criteria. At this time, there is limited research on video modeling and comprehension.

Video modeling and instructional strategies. O'Brien and Dieker (2008) performed a study measuring the effects of video modeling on implementation of literature circles in inclusive content area classrooms. As trends in special education are favoring inclusion, general educators are in need of assistance in establishing differentiated classrooms. The researchers hoped to discover if VM could help improve the translation of research on effective instructional strategies to actual practice in the classroom. Literature circles are considered a cooperative learning practice that has demonstrated to be effective for students with learning disabilities. The literature circle used in this study involved assigning each group member a role focused around a reading comprehension strategy. Again, the goal of the study was to see if students who viewed a video model would more effectively implement the practice than those who did not view the video. Students were given a pretest on basic knowledge of literature circles prior to watching an exemplary model of the implementation and afterwards a post-test was given. Students were then observed during the actual implementation. A pre and post-test of the content knowledge they were reading was also given. Students in the video-modeling group demonstrated significantly more effective implementation of the approach than the students who did not view the model. This research suggests that video modeling could improve the implementation of practices into learning experiences.

Self-Efficacy

In 1977, Albert Bandura introduced the idea of self-efficacy. He defined it as one's belief in one's ability to succeed in specific situations or accomplish a task. Self-efficacy is a component of the theoretical framework known as social cognitive theory. This theory suggests

that human achievement depends on interactions between one's behaviors, personal factors (e.g. thoughts and beliefs), and environmental conditions (Bandura, 1986, 1977). Increasing self-efficacy is thought to improve academic skills such reading ability (Schunk, 2003).

Self-efficacy and academic learning. Self-efficacy plays a strong role in motivation and learning. It affects what a student chooses to do, how hard they work, if they persist, and if they achieve (Schunk, 2003). Schunk (2003) found that, "Compared with students who doubt their learning capabilities, those who feel efficacious for learning or performing a task participate more readily, work harder, persist longer when they encounter difficulties, and achieve at a higher level" (p. 160).

When a student is successful their efficacy raises and when they fail it lowers. Students will often compare themselves to others. When they observe a similar peer perform a task, they are more likely to believe they are capable of performing it too (Schunk, 1987). Positive feedback ("You can do this") can also raise efficacy. Modeling is another effective way of promoting self-efficacy. Using models who are similar to the observer- in characteristics such as age, gender, ethnicity, and perceived competence- increases the likelihood of the observer producing comparable results (Schunk, 2003).

Modeling teaches and motivates students to learn and perform behaviors (Schunk, 2003). The observer believes they will be successful like the model if they replicate what they are doing. This is especially true when the observers have experienced difficulty or self-doubt about performing well (Schunk, 2003). This being said, peer models may be more desirable than teacher models and self-modeling may even be more desirable than peer modeling.

Self-efficacy and video modeling. In addition to improving reading skills, much of the research on video modeling discusses the positive effect that VSM has on self-image. As

discussed above, self-image is critical to student success. Students were enthusiastic to watch themselves on video and had newfound motivation to read (Ayala & O'Connor, 2013). Viewing images of personal success may have contributed to a feeling that success was possible for students participating in VSM groups. Viewing similar peers succeeding may also have contributed to increased confidence. If self-efficacy, or the belief that one's ability to succeed at a specific task, is an effect of video modeling, it is definitely a welcome one (Decker & Buggey, 2014).

References

Ayala, S. M., & O'Connor, R. (2013). The effects of video self-modeling on the decoding skills of children at risk for reading disabilities. *Learning Disabilities Research & Practice*, *28*(3), 142-154. doi: 10.1111/ldrp.12012

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. doi: 10.1037/0033-295X.84.2.191

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology, 4*(3), 359-373.

Bellini, S., & Akullian, J. (2007). A meta-analysis of video modeling and video self-modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children*, *73*(3), 264-287. doi: 10.1177/001440290707300301

Carter, S. L. (2010). *The social validity manual: A guide to the subjective evaluation of behavior interventions.* London, England: Academic Press.

Chard, D. J., Vaughn, S., & Tyler, B. J. (2002). A synthesis of research on effective interventions for building reading fluency with elementary students with learning disabilities. *Journal of Learning Disabilities, 35*(5), 386-406. doi: 10.1177/00222194020350050101

Clinton, E. (2015). Using video modeling to teach academic skills to students with disabilities: A review of the literature. *International Journal of Advanced Research*, *1*(11), 382-390.

Cortiella, C., & Horowitz, S. H. (2014). *The state of learning disabilities: Facts, trends and emerging issues.* New York, NY: National Center for Learning Disabilities.

Decker, M. M., & Buggey, T. (2014). Using video self-and peer modeling to facilitate reading fluency in children with learning disabilities. *Journal of Learning Disabilities*, *47*(2), 167-177. doi: 10.1177/0022219412450618

Good, R. H., Kaminski, R. A., Cummings, K., Dufour-Martel, C., Petersen, K., & Powell-Smith, K. (2011). *DIBELS Next Assessment Manual*. Eugene, OR: Dynamic Measurement Group.

Hitchcock, C. H., Prater, M. A., & Dowrick, P. W. (2004). Reading comprehension and fluency: Examining the effects of tutoring and video self-modeling on first-grade students with reading difficulties. *Learning Disability Quarterly*, *27*(2), 89-103. doi: 10.2307/1593644

Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baseline. *Journal of Applied Behavior Analysis*, *11*(1), 189-196. doi: 10.1901/jaba.1978.11-189

Individuals with Disabilities Education Improvement Act. (2004) Pub. L. No. 108-446, § 602, 118 Stat. 2657-2658.

Kennedy, C. H. (2005). *Single-case designs for educational research*. Boston, MA: Pearson Education, Inc.

Marcus, A., & Wilder, D. A. (2009). A comparison of peer video modeling and self video modeling to teach textual responses in children with autism. *Journal of Applied Behavior Analysis, 42*(2), 335–341. doi: 10.1901/jaba.2009.42-335

Musti-Rao, S., Hawkins, R. O., & Barkley, E. A. (2009). Effects of repeated readings on the oral reading fluency of urban fourth-grade students: Implications for practice. *Preventing School Failure: Alternative Education for Children and Youth*, *54*(1), 12-23. doi: 10.3200/PSFL.54.1.12-23

National Assessment of Educational Progress. (2015). *Reading and mathematics grade 4 and 8 national results*. Retrieved from https://www.nationsreportcard.gov/reading_math_2015/#?grade=4

National Institute for Literacy. (1997). *Literacy: It's a whole new world*. Washington, DC: Author.

National Reading Panel (US), National Institute of Child Health, & Human Development (US). (2000). *Report of the national reading panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. National Institute of Child Health and Human Development, National Institutes of Health.

O'Brien, C., & Dieker, L. A. (2008). Effects of video modeling on implementation of literature circles in inclusive content area classrooms. *Journal of Curriculum and Instruction*, *2*(2), 52-73.

Schrank, F. A., Mather, N., & McGrew, K. S. (2014). *Woodcock-Johnson IV Tests of Achievement*. Rolling Meadows, IL: Riverside.

Schunk, D. H. (1987). Peer models and children's behavioral change. *Review of Educational Research*, *57*(2), 149-174. doi: 10.3102/00346543057002149

Schunk, D. H. (2003). Self-efficacy for reading and writing: Influence of modeling, goal setting, and self-evaluation. *Reading &Writing Quarterly, 19*(2), 159-172. doi: 10.1080/10573560308219

Sutherland, K. S., & Snyder, A. (2007). Effects of reciprocal peer tutoring and self-graphing on reading fluency and classroom behavior of middle school students with emotional or behavioral disorders. *Journal of Emotional and Behavioral Disorders*, *15*(2), 103-118. doi: 10.1177/10634266070150020101

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, *11*(2), 203-214. doi: 10.1901/jaba.1978.11-203

APPENDIX B

Consent Form

Parental Permission for a Minor

Introduction

My name is Chelsea Ollar. I am a graduate student from Brigham Young University. I am conducting a research study about the effects of video modeling on student's reading skills. I am inviting your child to take part in the research because he/she has a disability and may benefit from this study.

Procedures

If you agree to let your child participate in this research study, the following will occur:

1. Your child will be asked to read for one minute 3-4 times.
2. One time your child will be filmed reading for one minute. We will not film your child without your permission.
3. Your child will then watch the video of himself/herself reading and read another passage 5-10 times across a few weeks.

Risks

We think there are a few risks to your child by being in the study. They might get embarrassed being filmed or watching the video of themself. If at any point they want us to stop, they can say so and we will.

Confidentiality

The research data will be kept in a secure location and on a password protected computer and only the researcher will have access to the data. All identifying information will be removed and the data. The data will be kept for three years.

Benefits

We don't know if being in this study will help your child get better at reading, but we hope it will. It may also help other students get better too.

Compensation

There will be no compensation for participation in this project.

Questions about the Research

Please direct any further questions about the study to Chelsea Ollar at (801) 370-4621 ext. 1346 or chelseao@provo.edu.

You may also contact Ryan Kellems at 801-422-6674 or rkellems@byu.edu.

Questions about your child's rights as a study participant or to submit comment or complaints about the study should be directed to the IRB Administrator, Brigham Young University, A-285 ASB, Provo, UT 84602. Call (801) 422-1461 or send emails to irb@byu.edu.
You have been given a copy of this consent form to keep.

Participation
Participation in this research study is voluntary. You are free to decline to have your child participate in this research study. You may withdraw you child's participation at any point without affecting your child's grade.

Child's Name:_____

Parent Name:_____Signature:_____ Date:_____

APPENDIX C

Phase Fidelity Checklist Forms

Baseline/Maintenance Phase Fidelity Checklist

	1. Gather materials: 2 copies of each passage to be read, pen/pencil, and stopwatch.
	2. Say, "*I would like you to read a story to me. Please do your best reading. If you do not know a word, I will read the word for you. Keep reading to me until I say 'stop.'*"
	3. Place the passage in front of the participant. Do not read the title to the participant.
	4. Say, "*Put your finger under the first word."* (Point to the first word of the passage.)
	5. Get stopwatch ready for one minute timing.
	6. Say, "*Ready, begin*." (If the participant reads the title, do not start the stopwatch until he/she reads the first word of the passage. Do not correct errors the participant makes while reading the title.)
	7. Start stopwatch.
	8. Follow along on the researcher copy of story. Leave blank any words read correctly. Mark a slash (/) through errors (including skipped words). The maximum wait time for each participant is 3 seconds. If a participant does not say a word within 3 seconds, say the word and mark it as incorrect. See *DIBELS Next® Assessment Manual* for further scoring rules.
	9. When stopwatch reaches the end of one minute say, "*stop,"* and remove the passage from the participant.
	10. Place a bracket ( ]) in the text after the last word provided by the participant.

*Adapted from *DIBELS Next® Assessment Manual.*

Intervention Phase Fidelity Checklist

	1. Gather materials: 2 copies of each passage to be read, pen/pencil, stopwatch, iPad with participant video, student chart and graph.
	2. Say, "*You are going watch a video of you reading fluently. When it is time for you to read, try and do it just like you did in the video*."
	3. (After first intervention session) Show the student their chart and graph. Show and tell them their score from the latest session and how much they went up or down from the previous score.
	4. Have participant watch video.
	5. Say, "*I would like you to read a story to me. Please do your best reading. If you do not know a word, I will read the word for you. Keep reading to me until I say 'stop.'*"
	6. Place the passage in front of the participant. Do not read the title to the participant.

	7. Say, "*Put your finger under the first word."* (Point to the first word of the passage.)
	8. Get stopwatch ready for one minute timing.
	9. Say, "*Ready, begin*." (If the participant reads the title, do not start the stopwatch until he/she reads the first word of the passage. Do not correct errors the participant makes while reading the title.)
	10. Start stopwatch.
	11. Follow along on the researcher copy of story. Leave blank any words read correctly. Mark a slash (/) through errors (including skipped words). The maximum wait time for each participant is 3 seconds. If a participant does not say a word within 3 seconds, say the word and mark it as incorrect. See *DIBELS Next® Assessment Manual* for further scoring rules.
	12. When stopwatch reaches the end of one minute say, "*stop,"* and remove the passage from the participant.
	13. Place a bracket ( ]) in the text after the last word provided by the participant.
	14. Subtract number of errors from total words read and tell the student their WCPM score.
	15. Have student add WCPM score to chart and fill in how much they went up or down from previous score.
	16. Have student plot their score and connect it with a line to the previous score. Check to make sure they graph correctly.

*Adapted from *DIBELS Next® Assessment Manual.*

APPENDIX D

Data Collection Form

	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7
Date							
Passage							
WCPM							
Accuracy							

APPENDIX E

Self-efficacy Questionnaires

Self-efficacy Pre/Post Questionnaire
Name:_____ Date:_____ Circle one: Pre/Post

1. For me, it's fun to read

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

2. I only read when I have to.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

3. I believe that practice will help my reading.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

4. I am a very good reader.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

5. I do not care about reading at all.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

6. I read a lot of books.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

7. I am a very poor reader.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

8. I am one of the best readers in my English class.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

9. I think reading is a waste of time.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

10. I can't change how good I am at reading.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

11. I do not like to spend time reading.

Never like me | *Almost never like me* | *Sometimes like me* | *Often like me* | *Most of the time like me* | *Always like me*

12. I can read hard books.

Never like me | Almost never like me | Sometimes like me | Often like me | Most of the time like me | Always like me

Self-efficacy Intervention Questionnaire

Name:_____ Date:_____

1. I am a good reader.

Strongly agree Agree Neutral Disagree Strongly disagree

2. Watching a video of myself read helps me read better.

Strongly agree Agree Neutral Disagree Strongly disagree

APPENDIX F

Social Validity Questionnaires

Participant Social Validity Questionnaire

Please answer these questions about your experience in this study. You can choose to write your answers or say them out loud.

1. What did you think about watching yourself read on video before reading another passage?

3. What did you think about using videos to help you read better at school?

4. Would you like to watch more videos of yourself reading?

5. Who have you told about getting yourself filmed and then watching the video?

6. Did watching the videos change your feelings about yourself as a reader?

Teacher Social Validity Questionnaire

Please answer these questions about your student's experience being filmed and watching their video.

1. How do you think they enjoyed watching themselves read?

2. What do you think they thought about watching themselves read on video while they were at school?

3. What impact did watching the videos have on their performance at school?

4. Can you see students watching videos of themselves read in the future? Why or why not?

5. Was it socially acceptable for them to watch the videos while they were at school?