A Fluency & Technology Learning Center for Struggling Readers

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MAE/Reading Endorsement K-12

Key Words
Fluency, struggling readers, learning center, technology, timed repeated reading

Abstract

The purpose of this action research was to investigate the success of using a combination of fluency strategies for intermediate grades in a self-directed learning model/center. This investigation sought to document the effectiveness of such a model/center through timed reading rate charts, journals, repeated reading, observation, and running records. The findings of the research revealed positive growth for the students in fluency, comprehension and reading rates. Furthermore, the multi-task student-directed model instilled confidence in the students; the addition of electronic books added extra focus for one of the students and more time for the teacher. The self-directed learning model increased student reading and fluency skills as well as allowed more effective time management for the teacher.

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Introduction

I am a graduate student at Otterbein College in Columbus Ohio. I have been involved in some form of education for most of my life in one way or another. I started a babysitting service when I was 11 and maintained it through college. I was an avid reader to my young charges. I read Bible stories at church and told stories of Native American culture during Saturday School at The Ohio State University (OSU). I graduated with a degree in Art Education and taught in four different schools before returning to OSU to pursue a degree in Elementary Education. I returned to the field as a substitute teacher having varied and interesting experiences with teaching. However, through the best and worst of these experiences students responded positively to reading, particularly being read to. As a result of my positive experiences with literacy, I decided to expand my qualifications in the field by pursuing my Masters Degree in Reading.

In the course of my graduate studies over the past few years, I have worked in several classrooms as a “reading intern”. In each class, regardless of the district or the classroom I observed that there were students who seemed to “fall through the cracks,” students who were by all accounts struggling with reading but not enough to merit additional support outside of the classroom. These students were painful to watch as they labored over each word. In some cases they would just stare at the page and look as if they would cry. These students would articulate that they were just very poor readers and actually apologized to me. This was all in all more than I could stand. No child should have to be so disconnected from reading!

In my past experiences with struggling readers I was intrigued by readers who could barely decode a word yet comprehend most if not all of what they read. On oral reading assessments these readers would test at a frustration level with significant miscues and
then score 100% on a comprehension test on the text. This was a mystery to me and seemed to be something that should be easily fixed. I felt these struggling readers had it in them to improve. They understood what they were reading but struggled pronouncing the words in the text. They wanted to be more fluent readers; they tried so hard that they would repeatedly reread things they had read correctly the first time. To me it seemed they possessed the most important aspect of literacy—comprehension—but lacked confidence in their reading. I decided that I wanted to find a way to help intermediate struggling readers become more confident and fluent readers.

"Fluency is of little value in itself—its value lies in what it enables." (Samuels & Farstrup, 2006).

Research

Fluency has been identified by many researchers and educational organizations as a very important aspect of reading success. The National Reading Panel (2000) identified fluency to be a key component of effective reading instruction. The National Institute for Literacy (2009) says, “Fluency is the ability to read a text accurately and quickly. When fluent readers read silently, they recognize words automatically. They group words quickly to help them gain meaning from what they read. They read aloud effortlessly and with expression. Fluency is important because it provides a bridge between word recognition and comprehension”. As I reviewed research on fluency, I focused my attention on repeated reading techniques, which appeared to be effective for the types of struggling readers I had known.

Timothy Rasinski (2003) identifies many advantages of repeated reading such as improved comprehension and “faster reading with greater word recognition accuracy” (p.77). Other researchers (Chomsky, 1976; Dowhower, 1987; Samuels, 1979; Samuels & Farstrup, 2006) identify greater gains in fluency and comprehension through repeated reading techniques. LaBerge & Samuels (1974) made a case for repeated reading and used the theory of automaticity (the ability to perform a task without significant demands on attention) to support the concept. All of the experts cited above advance the notion that excellent readers decode with ease; through repeated readings a struggling reader can switch attention from decoding to meaning. Yet, as I continued my study of evidence-based practice related to fluency, I found that the most progressive and effective learning involved a combination of reading strategies rather than one single method.

I decided to use The Basic Reading Inventory (Johns, 2005) to establish baseline reading rates. I then planned to combine repeated reading with fluent modeling (Strickland, 2002), decoding skills and sight word identification (Archer, 2003; Beers, 2003), running record analysis (Clay, 2002), high frequency vocabulary words (Hudson, 2005), reading journals (Fountas & Pinnell, 2001) and technology (Kamil, Intrator & Kim, 2000). Modeling made sense, as students would hear the correct way to read the text. Decoding practice would strengthen their fluency skills during their oral reading. Sight words had
to be addressed to give a stronger foundation for reading familiar words, and running records (Clay, 2002) would help me gain insight into the strategies that students were using (Rasinski, 2003). Reading journals gave students opportunities to write about their progress and provided kinesthetic reinforcement (Buus, 2005). Finally, technology has been shown to bring reading and writing together for students in a holistic way (Kamil, et. al., 2000). I was ready to use all of these tools in a learning center.

### Timeline Plan

I worked with five students over a two-year period. During this time I explored various strategies for improving fluency. Following these explorations, I drew upon my experiences and evolving understandings about fluency to design a logical systematic intervention for two target students. The end result was a final case study of two students that was conducted in a public suburban school library, a school computer lab, and a self-directed learning center in the students’ classroom.

### Background

Prior to starting the final case study I conducted informal research on three students, all in the intermediate grade levels. I worked with two girls and one boy, grades four and five. Subsequently, I conducted my final case study on two students from the second grade; one boy and one girl. The students were from diverse backgrounds (see Table 1-below).

The thing they all had in common was a problem with fluency. These students were all reading below their grade level (see Table 1-below). Additionally, it is important to note that when these students entered into the intermediate grades external support in reading waned. They were at risk for falling further behind. For these reasons I selected them for my action research.
Table 1

Student Demographics for Fluency Center Research

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>AGE</th>
<th>GENDER</th>
<th>ETHNICITY</th>
<th>ACTUAL GRADE LEVEL at time of test</th>
<th>GRADE LEVEL TESTED-WCPM Basic Reading Inventory percentile scores (Johns, Pre-assessment test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALAYA</td>
<td>9</td>
<td>FEMALE</td>
<td>AFRICAN AMERICAN</td>
<td>4TH GRADE</td>
<td>70% of 3RD GRADE</td>
</tr>
<tr>
<td>RAVEN</td>
<td>9</td>
<td>FEMALE</td>
<td>AFRICAN AMERICAN</td>
<td>4TH GRADE</td>
<td>36% of 3RD GRADE</td>
</tr>
<tr>
<td>TRENT</td>
<td>10</td>
<td>MALE</td>
<td>CAUCASIAN</td>
<td>5TH GRADE</td>
<td>28% of 5TH GRADE</td>
</tr>
<tr>
<td><strong>CASE STUDY-(1) ANNA</strong></td>
<td>8</td>
<td>FEMALE</td>
<td>EUROPEAN INDIAN AMERICAN</td>
<td>2ND GRADE</td>
<td>40% of 2ND GRADE</td>
</tr>
<tr>
<td><strong>CASE STUDY-(2) MASON</strong></td>
<td>8</td>
<td>MALE</td>
<td>CAUCASIAN</td>
<td>2ND GRADE</td>
<td>70% of 2ND GRADE</td>
</tr>
</tbody>
</table>

Exploratory Studies

My exploratory studies involved three students from the fourth and fifth grade level, one Caucasian boy and two African American girls from diverse suburban public elementary schools.

Instructional procedures

I focused on applying Rasinski’s Repeated Reading (1990) protocol. This technique includes the following steps: 1) text is given to the student/s; 2) student/s follow along as teacher reads the text; 3) teacher and student/s do choral reading; 4) student/s practice rereading the passage three times: 5) teacher and student/s pick three or four words to add to their word bank; 6) student/s engage in word activities.

I gave the students a passage of 100 words at their grade levels and then had them follow along as I modeled fluent reading of the text. Then I would have the student/s choral read along with me. Finally, I would have them orally reread the same text and time each of their re-readings.
For word activities I used word searches, flashcards, word definitions, and word banks on vocabulary within the passages. I found the repeated readings protocol changed the students’ fluency but not as much as I had expected.

**Alaya and Raven**

My first two students (Alaya and Raven-4th graders) scored at the frustration level on the Basic Reading Inventory (Johns, 2005) for fourth grade and instructional level for third grade. On the pre-assessment they scored at the 70th and 36th percentiles on the third grade passages for WCPM. The two fourth grade girls both had fluency challenges. Overall, I found that fluency was lagging behind comprehension.

A problem arose as I noted their repeated reading times were getting longer not shorter. The research on repeated readings (Rasinski, 2003) indicated that repeated readings lead to faster reading rates. In the case of these students, repeated readings appeared to lead to increased reading rates. Raven would add five to ten seconds onto her repeated readings, and Alaya would increase by ten to fifteen seconds. Following Rasinski’s protocol, I would model the text and then allow each student to read it a few times (while I timed each read). These two exploratory students continued to add on time with three and four re-readings- I was frustrated and concerned. A third exploratory student was about to begin the same intervention.

**Trent**

Trent was a fifth grader, a quiet young man. I gave the three students a survey on their opinion about reading and its importance in their lives. The girls wrote it was very important and they would use it later in life, but Trent wrote it was of no importance now or later. I used the same BRI pre-assessment as I had for the girls. Trent scored at a fourth grade instructional level and reached frustration on the fifth grade passage. His reading rates were 40th Percentile for one grade below and 28th Percentile for his own grade level on WCPM. I engaged Trent in the repeated reading protocol. Trent, like the girls, added five to fifteen seconds time on his repeated readings.

Additionally, I was using comprehension questions, guided reading, prior knowledge, and support with prompting with all three students. I added these strategies when I saw that the basic repeated reading technique wasn’t working. I hoped this would help their reading rate, but the rates did not increase.

Then one February day I was about to model and stopped. I wondered what Trent would be able to do if he had no model first. I just wanted to get a feeling of where he was on his own. So, I asked him to read aloud first this time. I called it a “cold reading.” He seemed puzzled, but complied. He read at about the same speed as he had for other first reads. I told him to listen while I read the text and read along silently. Then I asked him to read again, and something happened. Instead of adding seconds, his rate of reading time was cut in half! His prosody was also improved! We were reading a slightly longer text which took him a painful four minutes to read the first time, but only two minutes the second. His miscues also diminished drastically; he went from fourteen miscues in the first reading to three on the second.
His expression was smoother and more confident. I decided to have all three students use this format and do a “cold oral reading” of their own before I modeled. All three students improved their times and reduced their miscues by half or more. I was close to the end of my time with them, but they had raised their levels by 20% or more.

I gave each student an exit survey where I asked them to choose how important reading would be to their lives both now and in the future. The exit survey was quite telling. Trent stated he now believed reading was important and would continue to be important in his life when he got older. He had a sense of possibility about his reading he did not have when he started. Trent agreed to continue the same format at home with a family member who would model after his “cold read.”

The Change

Concept

I decided to apply the technique of “cold reads” to my Case Study interventions. I wanted to find research that would support this idea of a “cold read” before modeling as a valid technique. I wondered why the change to a “cold first oral read” by the student, followed by the fluent teacher modeling (instead of the fluent teacher model first) had made a difference. The research was not easy to find, but I came across some interesting information that I thought may be the reason the “cold read” first made a difference. The researcher, Lauree M. Buus (2005), was looking at the effect journaling would have on Reading Comprehension. I found information in Buus’s article on memory, particularly its function in a child’s capacity to learn. And what I was reading made me think this might be a reason the change had made a difference. The concept that interested me was something the researchers called “working memory.” My frustration had been that my students didn’t seem to remember what they had heard when we did the protocol with teacher modeling first. They did not apply any changes to their fluency and took longer to read the passages. Turkington & Harris (2001) identify memory as having three separate stages. I had prior knowledge of this fact, but what I found interesting was how they framed short-term memory as “working memory” and referred to it as a “mental work space” (p.256). They explained that we use this work space to sort and decode information before adding it to long-term memory. Hudson & Gillam (1997) discuss how the degree of participation and discussion of an event during the event can affect the encoding of information. I believe the students were able to encode the new information given in the fluent model after the cold read and make an adjustment to their own reading. In other words, I think they were able to hear the difference between their production and my production. They were able to use their “working memory” more efficiently as a result.

Topping identified “metacognition” as a key component in fluency (Samuels & Farstrup, 2006). Webster’s New Millennium Dictionary defines metacognition as “awareness and understanding one’s thinking and cognitive process.” The students were able to get
immediate feedback on their cold read and think about what they would do to correct their errors. I took this concept of a “cold read” before fluent modeling as the new approach to repeated reading intervention. I incorporated this change in strategy with my first case study student, a second grade student with strong desire to help me in this project and to become a better reader.

Case Studies

1st Case Study-Anna

My first case study student was an eight-year-old, second grade female named Anna. She attended a diverse suburban school. Anna was a sweet polite girl with wide eyes, whose family was Indian. Her teacher said she was not able to keep up with a small-group reading intervention, and believed Anna would benefit from one on one intervention.

I gave Anna the BRI; she scored at frustration level for WCPM on the second grade passage and at the instructional level on the second grade word list (see Table 2-below). Anna took a reading opinion survey and indicated that reading was very important to her life both now and in the future. She told me she wanted to become a better reader.
<table>
<thead>
<tr>
<th>Student</th>
<th>Grade</th>
<th>Passage Level</th>
<th>Oral Reading Accuracy</th>
<th>Comprehension</th>
<th>Words Per Minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anna</td>
<td>2nd</td>
<td>A2</td>
<td>Frustration</td>
<td>Independent</td>
<td>40 - (Pre-Test)</td>
</tr>
<tr>
<td>Anna</td>
<td>2nd</td>
<td>D1</td>
<td>Instructional</td>
<td>Independent</td>
<td>72 - (Mid-Test)</td>
</tr>
<tr>
<td>Anna</td>
<td>2nd</td>
<td>D2</td>
<td>Ind./Inst.</td>
<td>Independent</td>
<td>100 - (Post-Test)</td>
</tr>
</tbody>
</table>

Anna struggled with words and had little or no prosody, but she had good comprehension of what she read. I hoped that the modified repeated reading protocol would benefit her like it had the other three students. We started working with the same format; she would do a “cold read,” then I would model a fluent read; finally, she would read again.

I timed each of her readings and kept running records. I allowed Anna to journal about our work, writing about what she learned and what she felt she had accomplished. I taught her how to time and chart her own progress (see Figure 1-below). This allowed some release of responsibility from the teacher to the student (Manning, 1999), so that she could become self-directed in the fluency center. Anna loved to time herself with the stopwatch! She created her own chart and plotted her progress on a graph.
At first Anna sighed and paused a lot; she also had multiple miscues (substitutions that would change meaning, omissions, substitutions, reversals etc.). Anna was nervous about reading aloud, displayed little confidence, and would consistently reread passages she had read correctly (sometimes multiple times). Anna’s pre-assessment showed she read at a rate of 40 WCPM. She wanted to become a better, more fluent reader. Further assessment showed her repeated reading scores rising, but the first “cold reading” time did not rise as fast as the second or repeated readings (see Table 3).

My hope was to see Anna’s first “cold reading” times come up to meet her “second read” times. Our goal was to reach 100 WCPM in the first oral “cold readings” using 100 word passages at her grade level (2nd grade), and finally to score 100 WCPM on the BRI post-assessment 2nd grade level passage. I showed Anna the Spring, 2nd grade level standards for WCPM. She wanted to go beyond the high level of 94. She felt she could do it. We also set our goal to be 100% on Miscues using the BRI assessment at the 2nd grade level. Anna achieved all of her goals (see Table 3a). She accomplished this in sixteen sessions over eight weeks. Anna worked hard for this study and made significant gains.
Table 3
Repeated Reading Times: Anna

| 1\textsuperscript{st} Read-
Cold Reading | 2\textsuperscript{nd} Read-
Post-Modeling |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 45</td>
<td>1. 74</td>
</tr>
<tr>
<td>2. 34</td>
<td>2. 94</td>
</tr>
<tr>
<td>3. 41</td>
<td>3. 85</td>
</tr>
<tr>
<td>4. 40</td>
<td>4. 98</td>
</tr>
<tr>
<td>5. 61</td>
<td>5. 105</td>
</tr>
<tr>
<td>6. 58</td>
<td>6. 104</td>
</tr>
<tr>
<td>7. 62</td>
<td>7. 115</td>
</tr>
<tr>
<td>8. 60</td>
<td>8. 113</td>
</tr>
<tr>
<td>9. 52</td>
<td>9. 104</td>
</tr>
<tr>
<td>10. 57</td>
<td>10. 109</td>
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<tr>
<td>11. 76</td>
<td>11. 108</td>
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<tr>
<td>12. 80</td>
<td>12. 148</td>
</tr>
<tr>
<td>13. 82</td>
<td>13. 164</td>
</tr>
<tr>
<td>14. 88</td>
<td>14. 158</td>
</tr>
<tr>
<td>15. 94</td>
<td>15. 160</td>
</tr>
<tr>
<td>16. 90</td>
<td>16. 150</td>
</tr>
</tbody>
</table>

The Question

Teachers never have enough time to apply one-on-one intervention techniques, and this fact informed the idea for the rest of my action research. The question: Could there be a way to create a student-directed fluency center using these same techniques to help struggling readers become more fluent readers and help teachers with time? Since “time is of the essence,” I wondered if technology could help. I wanted to take the same model I had developed in my first case study and add a technology component. I planned to use
electronic books with my second case study, and expected there to be more books in electronic CD-Rom format than I was able to find. However, I discovered that some CD audio books work on the computer as well. I worked with books I could find in either DVD or CD-Rom format. I started this plan with my second case study. I explained the format of using the computer and timed repeated readings to my new student. He was very excited at the idea of using the computer.

2nd Case Study-Mason

Mason was a second grader with busy eyes. He had recently moved into a new suburban public elementary school. This school had a diverse population. Mason seemed to have a problem focusing, but his teacher was unsure of whether or not he had an attention deficit. She felt there was something else distracting him (maybe his new life and new school). Mason had a BRI pre-test score of 58 WPM at 2nd grade level. His comprehension was good from the beginning; we used the BRI comprehension tests for each passage he was tested on. He started with an 82% on the BRI for comprehension.

I hoped the computer would be a good way to focus Mason. He was drawn to the computer like a magnet. It really focused him in on the task, as opposed to when he was using a CD player, (where he looked around the room and wiggled). Mason did not need text on the screen; audio markers within the computer screen held his attention just as well. He was using the audio, reading along in the book and staying focused. When I first worked on coaching him in the fluency model I had to constantly refocus him; however, using the computer with the book or audio CD seemed to be very helpful.
Mason’s BRI pre-assessment reading scores for 1st grade were at instructional level, and at the frustration level for 2nd grade (see Table 4-next page). His BRI reading rate score was 70 wpm for 2nd grade level. His BRI post-assessment score for word analysis was independent at 1st grade level and instructional at 2nd grade level. He scored a BRI reading rate of 120 wpm for 2nd grade level on his post-assessment. Mason showed significant improvement in his rate of reading between first “cold read” and second reading (see Table 5-next page). He loved the computer component which served as his fluent model. Mason was self-directed in the fluency center. Most notable was his improved attention span with the addition of the computer and technology.

(Table 4)

<table>
<thead>
<tr>
<th>Student</th>
<th>Grade</th>
<th>Passage Level</th>
<th>Oral Reading Accuracy</th>
<th>Comprehension</th>
<th>Words Per Minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mason</td>
<td>2nd</td>
<td>A2</td>
<td>Frustration</td>
<td>Independent</td>
<td>53</td>
</tr>
<tr>
<td>Mason</td>
<td>2nd</td>
<td>C2</td>
<td>Instructional</td>
<td>Independent</td>
<td>120</td>
</tr>
<tr>
<td>Mason</td>
<td>2nd</td>
<td>B2</td>
<td>Ind./Inst.</td>
<td>Independent</td>
<td>92</td>
</tr>
</tbody>
</table>

Mason had an aptitude for all things technological. I was worried that he wouldn’t be able to handle timing himself with a stopwatch while working the computer and listening, but Mason was very good at multi-tasking. Although Mason had no computer at home, he took to it like a pro.
Mason was absent for one week during the intervention which affected his baseline on the graph (see Figure 2- previous page). His first reading ("cold read") scores are on the bottom, with second read scores on the top line. The goal was to get the bottom line to reach the top line and stay constant. Then he would be reading his first “cold reads” at the same rate as his second readings (without benefit of the fluent model) which would show he was retaining the ability to read faster on his own.

Mason had started to reach the top line and run constant in the third and fourth week (where he spiked at 145 WPM using 1st grade text and 110 WPM using 2nd grade text). He missed most of one week, started slowly the following week, but picked it back up quickly.

### Table 5
*Reading Times*

<table>
<thead>
<tr>
<th>1st Read-Cold Reading</th>
<th>2nd Read-Post-Modeling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 50</td>
<td>1. 160</td>
</tr>
<tr>
<td>2. 31</td>
<td>2. 177</td>
</tr>
<tr>
<td>3. 81</td>
<td>3. 153</td>
</tr>
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<td>4. 55</td>
<td>4. 155</td>
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<td>5. 96</td>
<td>5. 115</td>
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<tr>
<td>6. 142</td>
<td>6. 167</td>
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<tr>
<td>7. 75</td>
<td>7. 180</td>
</tr>
<tr>
<td>8. 89</td>
<td>8. 190</td>
</tr>
<tr>
<td>9. 75</td>
<td>9. 190</td>
</tr>
<tr>
<td>10. 115</td>
<td>10. 185</td>
</tr>
<tr>
<td>11. 24</td>
<td>11. 155</td>
</tr>
<tr>
<td>12. 63</td>
<td>12. 165</td>
</tr>
</tbody>
</table>

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**Figure 2**

*Mason’s Fluency Graph*
Conclusion

Did the fluency center work? I would argue that the answer to that question is “yes.” The change of using a “cold read” before fluent modeling was successful for accelerating the students’ reading rates. The addition of student-created graphs and technology allowed some release of responsibility from the teacher to the student. I believe this format can be tailored to meet a variety of fluency levels. The only drawback may be the availability of technology. However, the teacher-directed fluent modeling format would still work in the absence of the technology. Since teacher time is often an issue, parent and/or peer partners could also work as fluent models.

Does the computer replace the teacher? In my experience, students benefit from being coached for a few weeks first and then they can continue the process with computer or audio-computer as the fluent model. The addition of technology for the fluency center will allow self-directed work for students; however it is important to recognize that the students need to be monitored on an ongoing basis. Obviously, research on technology and reading is a “tapestry under construction” (Kamil, Intrator & Kim, 2000, p. 783).

“Ah yes, but will it transfer”? I have heard this question from teachers and administrators. Some might say, “This just shows how important the component of practice is.” So, which is it—Transfer challenge or practice makes perfect? I believe the answer is in the question. The “transfer” can and will occur but only with the practical application of the process, the warehouse for more or less “permanent knowledge is our long-term memory” (Levine, 2002, p.93). The continuation of short-term practice is likely to create the permanent knowledge needed for fluency. If it has become “permanent,” is that not transference?

In addition to improving their oral reading performance, struggling readers need to overcome their own concerns about their reading. From survey results, I was able to conclude that all participants had limited confidence in their reading at the outset but were more confident and able to express purposes for reading following the intervention. They responded that reading was very important to their lives both now and in the future.

Student-directed learning, along with improved skills that could be documented visually on progress graphs, helped to build confidence. Since we pull information from long-term memory to reprocess or reproduce it (Zimbardo, Weber, & Johnson, 2003), continuing this process should develop and increase their reading skills, encouraging them to see themselves as good readers. The easier it is to read, the more likely it is that children will elect to do so. Practice can make perfect.
References


