

Does *Reading Horizons* Improve the Reading Fluency of Struggling Readers?

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Abstract

The purpose of this action research study is to measure the impact of the *Reading Horizons* curriculum on the reading achievement of students in third grade, which includes students in regular education students as well as students receiving special education services in the area of reading fluency, when compared with the reading achievement using AIM's Web fluency assessments. There is a great deal of research involving computer assisted learning, but what does the research really mean in terms of increasing fluency. The quantitative study includes scores from third grade students from regular education as well as scores from students receiving special education services in the area of reading fluency. The statistical data from a T-Test, after a one year study, indicated significant difference in scores. After compiling and review of this study, current literature and research, as well as statistical data, it is found that Reading Horizons does in fact show a greater percentage of growth, and that this program could in fact help to show growth in the reading proficiency of students in grades K-12. In conclusion of this study it is recommended that further data be collected district wide, for a longer period of time in order to substantiate the impact on the annual yearly progress standards as accessed by the Missouri Assessment Program (MAP) and EOC tests.

Introduction

Background, Issues, and Concerns

As educators we often see the pendulum swing one way, and then the other in terms of educational pedagogy incorporated in the classroom. During the past 20 years, we have seen the dawn of a new era in instruction: computer-assisted instruction. Our students are changing the way they learn, and teachers are changing the way they teach. As teachers, we wrestle with the challenges of using technology to teach our students basic tasks such as reading. Can technology really make a difference in the way our students learn and how much they learn? How will we know a specific technology is actually causing the growth we see? How can we be sure?

The interest in this topic is directly related to special education instruction and the ways these students learn. Some students with special needs learn using conventional methods, while others struggle despite repeated teaching using tried and true research-based best practices. This research is seeking programs that can teach students with special needs who do not learn from traditional methods. Specifically, is there a computer program that could improve the oral reading fluency of students with special needs? The issue of technology generates a set of questions and concerns that also need to be considered. Technology, while readily available can still be difficult to work with at times. When using technology to teach students one must always have a “plan B” just in case computers are not available or if something breaks down. In addition there are still educators who have ill feelings towards the growing trend of technology. What if they cannot learn the program, or just don’t want to embrace the technology wave that has come through their district. Reading Horizons was chosen because it is the best of both worlds. It allows for instruction that is teacher based as well as reinforcement and teaching via

technology. This allows for multiple teaching styles, while also incorporating technology. This program also has a proven history and track record of success from previous studies.

Practice under Investigation

This research study investigates the impact of *Reading Horizons* on struggling readers. *Reading Horizons* is a research-based reading program that offers individualized instruction in reading for students enrolled in grades K-12. Results of research studies reportedly validate this program's ability to help struggling readers in grades 1-4.

School Policy to Be Informed by this Study

School districts in the state of Missouri must meet the Annual Yearly Progress (AYP) standards as accessed by the Missouri Assessment Program (MAP) and EOC tests. The fluency rate of students in elementary school can play a large part in students' reading comprehension scores. If we had the ability to increase the fluency rate of students, the percentage of students who do well on MAP or EOC tests might rise dramatically, thus having a positive impact in many areas of education dictated by Missouri school policy. Improving teachers' abilities to raise scores will not only benefit students with special needs but also raise the overall score for our district.

Conceptual Underpinning

The idea that a computer-assisted learning technique can make a significant difference in students' learning is aligned with a theory called the Levels of Processing (Craik & Lockhart, 1972). Their theory suggests that the deeper the level of processing, the deeper the students' knowledge. Theoretically, we remember things that are meaningful to us. Our students are mesmerized by technology, so what better resource to teach them with? If Craik and Lockhart's

theory holds true, then our students will remember more of the academics we teach if we incorporate what motivates them in our instructional plans.

Statement of the Problem

Can the use of the *Reading Horizons* computer program improve reading fluency of struggling readers?

Purpose of the Study

The purpose of this action research study is to measure the impact of the *Reading Horizons* curriculum and computer program on the reading achievement of students in third grade, which includes students in regular education students as well as students receiving special education services in the area of reading fluency, when compared with the reading achievement using AIM's Web fluency assessments.

Research Questions

Research Question 1: Does *Reading Horizons* improve fluency at a higher percentage than AIM's Web over the course of three benchmark dates?

Research Question 2: Is there a significant difference in scores over the course of three benchmark dates using the Reading Horizon's program?

Null Hypothesis

Null Hypothesis 1: There is no difference in oral reading fluency scores of students who participated in the *Reading Horizons* intervention and students who did not participate in the intervention.

Anticipated Benefits of the Study

Educators will have a better idea of how technology, specifically, computer-assisted instructional software, influences our students and their learning. In doing this action research study, the research will attempt to determine if *Reading Horizons* helps students increase achievement in reading fluency.

Definition of Terms

Phoneme: The smallest unit of sound

Phonics: The understanding that there is a predictable relationship between phonemes and graphemes, the letters that represent those sounds in written language

Phonemic awareness: The ability to notice, think about, and work with the individual sounds in spoken words

Reading Horizons: A reading system based on a methodology that provides explicit, systematic, sequential instruction in decoding, spelling, and pronunciation strategies. This reading system has helped hundreds of thousands of beginning readers, struggling readers, and English Language Learners (ELLs) find reading success for the first time. Using the program, the average student gains two-to-three grade levels in reading with just 50 hours of instruction and is empowered with all of the skills needed to continue to improve their reading ability.

Summary

A study was conducted to see what impact the *Reading Horizons* computer program has on the reading fluency of students in third grade. If the statistical analysis demonstrates a significant difference, what changes should teachers and school districts make? Educators will have a better idea of how technology, specifically, computer-assisted instructional software, influences our students and their learning. In doing this action research study, the research will attempt to determine if *Reading Horizons* helps students increase achievement in reading fluency. This

research study investigates the impact of Reading Horizons on struggling readers. Reading Horizons is a research-based reading program that offers individualized instruction in reading for students enrolled in grades K-12. Results of other research studies on the Reading Horizons website reportedly validate this program's ability to help struggling readers in grades 1-4.

Review of the Literature

There are many studies related to the impact of technology on the reading achievement of students enrolled in elementary schools. Educators question, “Is computer-assisted learning beneficial in helping students with special needs increase their reading achievement?” *Reading Horizons* (2013) is a research-based program that claims it can help struggling readers become more successful. The program utilizes computer-assisted learning that allows each student to progress at his/her own pace and receive teacher instruction in addition to computer-assisted learning. *Reading Horizons* (2013)

The use of technology is common in many schools across America today. Teachers as well as students utilize different types of technology every day to help them with instruction and evaluation as well as academic drill and practice. The introduction of the Xbox as well as SMARTBoards and iPads has revolutionized the way today’s students think and learn. Electronic instructional gadgets seem to be the wave of the future and are a means of grabbing the attention of people of all ages.

Students who struggle with learning can often become bored and frustrated with rote drill and practice type of academic instruction. The use of technology could be a very helpful tool to engage students. In fact, Atkinson (1974) reiterates the fact that the use of technology can be of significant help. This study, which was done at Stanford University over a period of eight years, presents data based on attempts to teach children to read using computerized instruction. The results were positive and showed computerized instruction was beneficial. However, the author also said, “it was shown that some aspects of instruction could be done very effectively using a

computer, but that there were other tasks for which the computer did not have any advantages and possibly had some disadvantages over classroom teaching” (p. 171).

Another study including eight African-American first-grade students using computer-aided instruction also showed positive results. Gibson (2011) stated,

A pre-intervention/post-intervention analysis showed that all of the participants increased their reading fluency, 5 of the 8 participants reduced their risk status, and 7 of the 8 students increased their reading rate. All of the students improved their comprehension scores. The results support supplementary interventions and computer-based reading program (p. 275).

iPads have been introduced in many classrooms across America, but how can teachers accurately judge the impact this new technology has on academics? One study suggests that the use of iPads can significantly improve student growth. According to McClanahan (2012), who compared pretest and post-tests assessments used on a student in elementary school, one student made one year’s worth of growth in a six-week period. This was done using a one-on-one tutor for the fifth-grade struggling reader. This is an amazing accomplishment due to the fact that this particular student had Attention Deficit Hyperactivity Disorder.

Another consideration of the amazing results is the large number of applications (apps) available to choose from when using this device. If a student loses interest, another app is available to switch to at a moment’s notice. This is an important piece of my research since students need to have instructional materials that can hold their interest. It is also noted that this particular article was about a one-on-one tutoring session. The use of interventions in this manner may produce the desired results just due to the engagement time and the focus of a particular student. McClanahan (2012)

This generated curiosity about other programs that could be used to assist students in other areas. One such program is called *Write to Learn* (Pearson Education, Inc., 2013); this software program is similar to Reading Horizons because it offers frequent tutorials for students as well as opportunities for immediate feedback and revision of tasks. Students who used this particular program showed significantly better comprehension and writing progress in a little over two weeks (Lovell, 2009). Yet another study involving computer-assisted remedial reading interventions using a program called *Grapho-Game* (n. d.) indicated similar results with computer-aided reading interventions. Students were tracked from the time they entered school until they reached the third grade. Saine (2011) stated, “The results indicated that children at risk for developmental reading failure would benefit from a remedial reading intervention that is enriched with the CAI application like Grapho-Game in the very beginning of the first grade” (p. 1021).

In another study that involved not one but two computer-aided learning interventions tested against each other, students showed positive results after 12 months of data collection. Data collected from the two groups showed significantly better results for one group than the other due to the students accessing the computer-aided instruction on a more frequent basis. Underwood (2000) noted that, “Such software cannot be ‘shoe-horned’ into the normal timetable structure; unless a school adapts to the paced practice regime, there is likely be a negative impact on learning” (p. 141). This information suggests that computer-assisted instruction needs to be implemented on a regular basis for it to be successful.

Further research of peer-reviewed articles in the professional literature uncovered a study conducted in 2006, in Boston, Massachusetts, that attempted to study the impact of a computer

program made by Lexia which was designed to provide intensive, structured and systematic practice in learning and applying word-attack strategies to improve word recognition skills (Lovell, 2009). Phonological awareness was taught in conjunction with the phonic word-attack strategies. Word-attack strategies and word recognition are precursors to oral reading fluency. The results did not show significant differences between the control group and study group; however, the researchers did notice a significant improvement in those students who were receiving Title I services as well at the same time they were participating in the program. The high level of phonics intervention generated a large increase in fluency for these students. Further testing was scheduled to see if this program could produce results for other students with learning disabilities.

In looking further for additional information, Ecalle (2009) used computer-aided instruction to help students with dyslexia. This study revealed that students with language impairments as well as impairments such as dyslexia could benefit from computer-assisted instruction (CAI). Ecalle stated,

Computers are an integral part of the daily life of many children, and we must ensure that the use of computer- assisted learning in the classroom will prove to be an asset for poor readers and writers. We know that children with reading and writing difficulties are motivated by certain uses of computer technology, and this fact must be exploited to ensure the greatest benefit to struggling readers. Moreover, in clinical practice, reading therapy is individualized, and adapted to the patient depending on his/her deficit. Speech therapists could use this type of audio-visual training method to develop literacy skills in children undergoing speech and language therapy (p. 10).

Why are teachers so concerned that students develop oral reading fluency? Deficits in letter recognition, phonological awareness, and decoding are often underlying causes of struggling readers. According to the National Institute for Literacy Panel (1997), which first convened in 1997, reading failure has significant long term consequences. This panel identified five areas of study that are important for reading success: phonemic awareness, phonics, fluency, vocabulary, and text comprehension. Each skill has its own strategies to be taught for students to become successful readers. The research from the panel stated the following:

Phonemic awareness instruction improves children's ability to read words. It also improves their reading comprehension. In addition they tell us that phonemic awareness instruction aids reading comprehension primarily through its influence on word reading. For children to understand what they read, they must be able to read words rapidly and accurately. Rapid and accurate word reading frees children to focus their attention on the meaning of what they read. Of course, many other things, including the size of children's vocabulary and their world experiences, contribute to reading comprehension (Armbruster, 2001, p. 15).

This information is important to understand as teachers recognize that not all things can be taught by computer-assisted learning. However, educators can supplement direct instruction with technology. In order to learn, students need to be engaged in learning, though teachers need to remember that CAI cannot replace classroom instruction. In a study done in Indonesia (Azur, 2013), significant progress was made with students who completed the study when computers were used to assist teachers in reading instruction. These students were given practice at regular intervals using computer instruction.

The National Institute for Literacy Panel (1997) suggested that regular intervals of computer instruction, as well as the use of computers themselves, were an important part of the learning that was achieved. The panel also stated,

Computers play an important role in developing reading ability among students. The use of computers in language teaching, which can influence not only the effectiveness of teaching but also students' language proficiency, is an appropriate effort to be made in order to have an impact on the problems being faced. As the latest teaching aids, the use of computers is seen as an effort that could change students' perception on language learning (p. 4).

The review of the literature on computer-assisted instruction indicates that computer-based learning can have a significant impact on learning, if presented in the correct way. In reviewing the literature regarding computer-based learning, it seems that this type of learning can often benefit students with learning disabilities; however, the improvement is small in some cases. The variance of improvement could be due to the difference between students' ability to learn as well as the different personalities of each student. Not all students learn the same, nor will they respond to teaching methods in the same manner. Results of research studies indicate that technology does make a difference in students' learning, and that repeated exposure to computer-assisted learning does have an impact on some students. Those students who had regular access to technology to supplement their instruction were able to maintain or grow in the ability to read at their level.

The Reading Horizons Program is a computer-based learning program that also provides supplements for teachers to use in teaching concepts and reinforcing areas of concern with teacher-lead lessons. Computer instruction and teacher instruction go hand in hand. There were

no similar computer-assisted programs for reading fluency found during the review of the literature

Teachers need resources to help them teach their students, and districts need a way to raise test scores in order to meet the state standards. The methods researched that involved technology seems to suggest that students do benefit from the use of technology.

Research Methods

Research Design

A quantitative study was conducted to see what impact the Reading Horizons instruction and computer program had on improving reading fluency of struggling readers enrolled in third grade. The independent variable being tested was broken into two categories which are those students having Reading Horizons instruction and those having Aims Web based fluency. The dependent variable tested was the benchmark testing assessments. Benchmark testing was given three times during the school year, in the fall, winter, and spring.

Study Group Description

The members of the group being studied are students in the third grade. For testing purposes ten students, were selected at random from the third grade population, and three students from special education population were selected as well. Their scores were used in comparison during the research analysis. All students are white, and include 6 male and 7 female. Students all attend the same elementary school, which is a title one school. In addition 11 out of the 13 students receive free or reduced lunch.

Data Collection and Instrumentation

Data was collected over the 2013-2014 school year. During the school year all students were given the Aims Web Bench mark testing, while the group of three students was given Aim's web as well as Reading Horizons Bench mark testing. Scores were taken from fall, winter, and spring benchmark testing timeframes. This study looked at the outcome from two theoretically different reading programs at the end of the benchmark testing periods for both

tests. The Aim's Web benchmark testing is given to each student individually. The goal for a student to be in the average or above average range by spring benchmark for third grade would be for them to read 74-179wpm. Students are asked to read a passage given to them on paper for one minute. The mistakes are tallied by the teacher as well as the words per minute that were read correctly. Reading Horizons benchmark testing is done on the computer and is broken down into five different testing areas which are phonemic awareness, most common sight word awareness, spelling, and word recognition. Data is collected for each student and lessons move according to student progress, and data is also used to guide teacher instruction. Benchmark scores look different for Reading Horizons due to the difference in computer versus paper assessments, as well as the different tests offered for each type reading assessment.

Statistical Analysis Methods

A T Test was conducted to find if there is significant growth when comparing the difference of benchmark fluency scores between Reading Horizons and Aims web. The mean, mean D, t-test, df and p-value were concluded from this test. The Alpha level was set at 0.25 to test the null hypothesis. The independent t-test is commonly used to compare a sample group's scores before and after an intervention. The independent t-test is also commonly used to compare how a group of subjects perform in two different test conditions. The conditions here are Aim's Web as compared to Reading Horizon's.

Findings

A T-Test was conducted to decipher if there is significant difference between students reading progress when comparing Reading Horizons to Aims web. The following tables will show organized findings based on the statistical raw data found from the scores gathered. The study includes data collected from one school year, which is derived from scores collected in the fall, winter and spring. Scores from the spring semester are used to show growth from both programs.

AIM's web is a curriculum based universal screening and monitoring tool used by educators to track progress of students reading fluency throughout the school year. Aims web uses brief and reliable measures of reading performance to help teachers track success and growth of students throughout the year as well as to identify the need for an intervention for struggling readers. The data collected, shown in figure 1, during the period noted shows a range of 75, with a high score of 167 and low score of 86. The mean of the Aims web data was 132.6, and the Standard deviation is 18.8, while the median is 134.

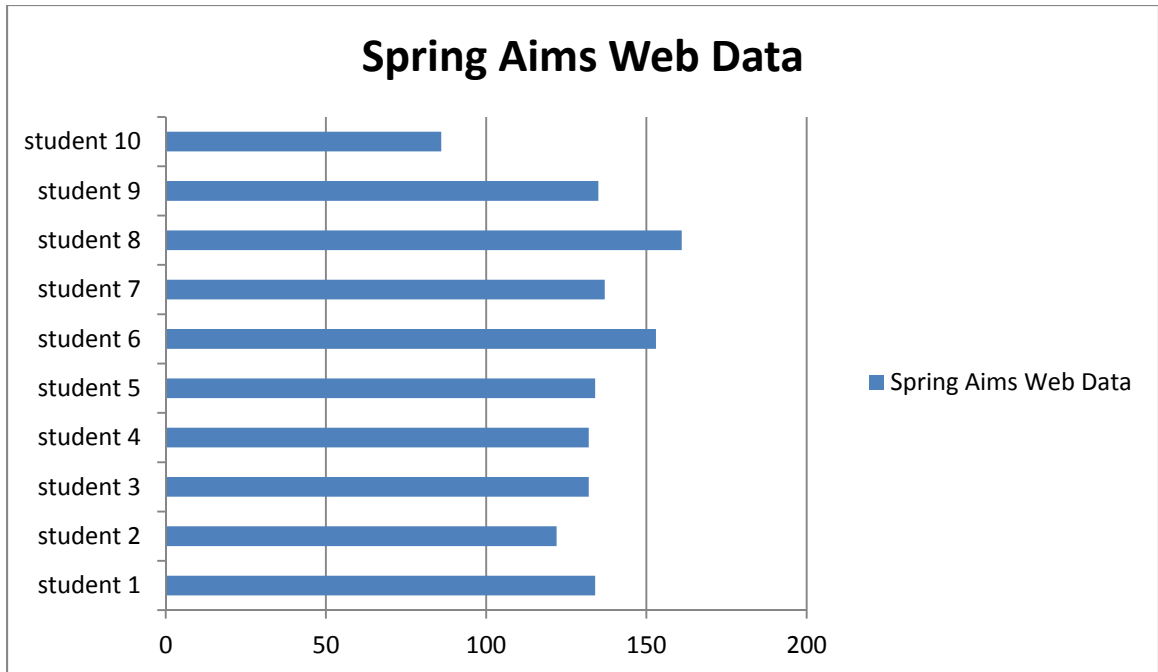


Figure 1

The data collected for the spring benchmark, shown in figure 1, during the period noted shows a range of 75, with a high score of 167 and low score of 86. The mean of the Aims web data in figure 1 is 132.6, and the Standard deviation is 18.8, while the median is 134.

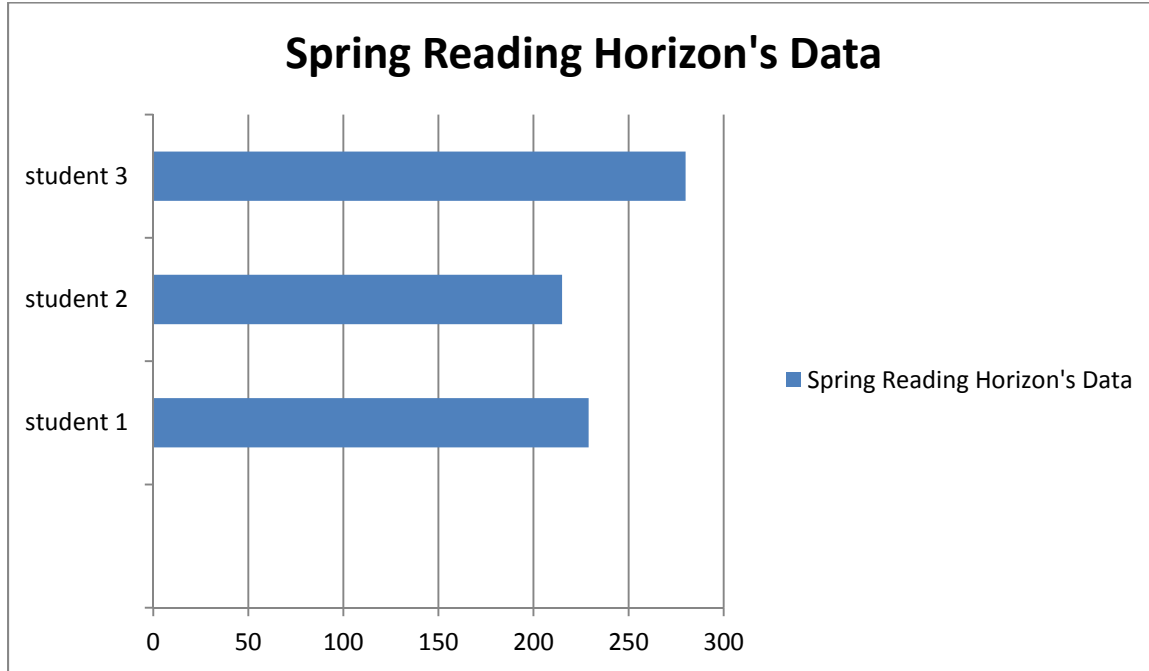


Figure 2

In addition to Aims web, a group of three select students were instructed and tested using the Reading Horizon's program. Reading Horizons is a research based intervention which uses brief reliable measures of reading performance in order to track student progress. In addition it is used to target intervention areas indicated, as well as teach phonics based skills to students throughout the school year. The data collected during the spring, shown in figure 2, has a range of 65 with a high score of 280 and a low score of 215. The mean of the spring scores is 241.33, while the median is 362, and the standard deviation is 27.94

A T Test was conducted to find if there is a significant growth difference between Reading Horizons and Aims web based instruction. The mean, mean D, t-test, df and p-value were concluded from this test. The Alpha level was set at 0.25 to test the null hypothesis. There

is significant difference between the scores of students on the Reading Horizons program when compared to scores of those students from the Aims web program.

T-Test Analysis Results for Reading Horizons as compared to Aims web

Source	Mean	Mean D	<i>t</i> -test	df	<i>p</i> -value
Reading Horizons (n=3)	241.33				
Aims web (n=10)	125.4	115.93	7.02	11	2.20 E-5

Note: Significant when $p \leq 0.25$

Figure 3

The independent variable used was the two reading assessments, Aims web, and Reading Horizons. The dependent variable is the benchmark testing. The mean Composite score for the group of 3 students using Reading Horizons was 241.33, while the mean Composite score for the group of 10 using Aims Web was 125.4. The difference between the mean scores (Mean D) was 115.93. The *t*-test value was 7.02. The degrees of freedom were 11.

The null hypothesis was: There is no difference in oral reading fluency scores of students who participated in the *Reading Horizons* intervention and students who did not participate in the intervention. The null is rejected because the *p*-value is 2.20E5, which is less than the alpha level of .25. This means that there is a significant difference between the two Reading Programs and the scores derived from them using the spring benchmark testing. This is also shown by the value of the mean of each. The mean for Reading Horizons is 241.33 while the mean for Aims web is 125.4 indicating a significant difference in scores. Reading Horizons shows a better

percentage of improvement in reading scores over the three benchmark tests given. Reading Horizons is the better program in the opinion of this study.

Conclusions and Recommendations

The results of this study show that the Reading Horizons program was able to produce a greater level of student achievement over a one year period when compared to Aims Web. This study indicates that the difference is significant, and that Reading Horizons did in fact raise the reading scores of students in Special Education who often have the most difficult time raising their level of reading. This is also shown by the value of the mean of each as also illustrated above. The mean for Reading Horizons is 241.33 while the mean for Aims web is 125.4 indicating a significant difference in scores.

This indicates that the Reading Horizons Program, if used district wide has the potential to raise reading scores for all students within the district. One study from the review of literature suggested that the use of iPads could significantly improve student growth. In fact, according to McClanahan (2012), when comparing pretest and post-tests assessments used on a student in elementary school, one student made one year's worth of growth in a six-week period. This is similar to the results found with the Reading Horizon's program. Theoretically, we remember things that are meaningful to us. Our students are mesmerized by technology, so what better resource to teach them with? If Craik and Lockhart's theory called the Levels of Processing (Craik & Lockhare, 1972) holds true, then our students will remember more of the academics we teach if we incorporate what motivates them in our instructional plans.

After concluding this study, it is apparent that there are further studies that could be done. A study could be conducted to find out if using technology in our district has an impact on our reading or math scores. Furthermore, it is recommended that the Reading Horizon's program be studied at a more in depth level. In fact, it is recommended that Reading Horizons should be implemented for all students district wide and further study conducted to track the growth of

reading scores of these students as they progress through each grade level until graduation. In doing so it will give educators an even better picture of how this computer assisted instructional program can influence students and their learning. . It is possible that this program could give us the ability to increase the fluency rate of students. The percentage of students who do well on MAP or EOC tests might rise dramatically, thus having a positive impact in many areas of education dictated by Missouri school policy Further implications of this study indicate that computer assisted learning is beneficial for student achievement. Technology has become a very important teaching tool, and students respond well when it is used in the correct way. In addition professional development is needed to ensure teachers have the training they need in order to utilize the technology their district has provided them with. It is also important that teachers understand the implications of using technology and the difference it can make in student achievement. Teachers need to be made aware of data and statistics that show technology is making a difference in student achievement. In addition teachers should be kept up to date on the latest technology as it becomes available, so that they may pass this information along to students and incorporate it into their classrooms. In conclusion, it is recommended that further data be collected district wide, for a longer period of time in order to substantiate the impact on the annual yearly progress standards as accessed by the Missouri Assessment Program (MAP) and EOC tests.

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