THE EFFECTS OF THE i-READY COMPUTER ASSISTED INSTRUCTION PROGRAM ON THE READING AND FLUENCY ACHIEVEMENT OF FIRST GRADERS

A Thesis Presented to the Faculty of California State University, Stanislaus

In Partial Fulfillment of the Requirements for the Degree of Master of Arts in Education

By Tara Bingham Silva August 2016
CERTIFICATION OF APPROVAL

THE EFFECTS OF THE i-READY COMPUTER ASSISTED INSTRUCTION
PROGRAM ON THE READING AND FLUENCY
ACHIEVEMENT OF FIRST GRADERS

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Professor of School Administration

____________________________________  ____________________
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Professor of Education
DEDICATION

This work is dedicated to my aunt Shelley Barry, sister Ashleigh Bingham Reich, Allison Shaw and Greg Bender. They knew I was brave and strong and broken all at once during this journey. They encouraged, inspired and believed in my dreams. My two children Cole and Camryn Silva were the beat of my heart, the pulse in my veins and energy of my soul that kept me going.

Finally, this work is dedicated in memory of my father, Dr. Steven Bingham and to my grandparents, Stanford and Rochelle Bingham. Your lives were a blessing; your memory a treasure; you are loved beyond words and missed beyond measure.
ACKNOWLEDGEMENTS

Grateful acknowledgements are made for the valuable suggestions and help given to me by Dr. John Borba. You gave me the wisdom to know what must be done and the courage to do it. Thank you, Dr. Neufeld for you guidance and suggestions throughout this process and for serving with Dr. Borba in my advisory committee.

To my hard working and dedicated first grade team at Las Palmas, the elementary school teachers and administrators of the Patterson Unified School District.
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ABSTRACT

The i-Ready CAI program is a comprehensive educational software program designed to build reading skills and concepts in grades K-8, stand alone or to supplement existing curricula. The program's capability to individualize lessons, assess and track student progress, is aimed at keeping potentially "at risk" students at grade level. The purpose of this study is to determine the effectiveness of the i-Ready computerized reading program in improving the reading achievement of first graders. The results of this study may provide additional information regarding the effectiveness of CAI.

This quantitative study was conducted at an elementary school located in a school district in the Central Valley of California during the 2014–2015 academic year. Students in both the treatment and control groups took an Open Court fluency pre and post test and a pre-and post test i-Ready reading diagnostic test determine if differences in reading and fluency achievement existed between the two groups. Students who participated in the i-Ready program, also participated in the daily core English language arts program. The treatment group (n = 40) took a pre-i-Ready reading diagnostic test. The results from the i-Ready reading diagnostic test provided the teachers with each student’s reading level, pinpointed each student’s subskill needs and customized instruction according to each student’s placement level. The treatment group participated in i-Ready for 20-minute sessions 3 times a week for six consecutive weeks. The control group (n = 40) received instruction in the daily core English language arts program without computer assisted instruction. An ANCOVA
was performed on the pre and post reading assessment data of first-grade students who participated in the i-Ready CAI program and first-grade students who did not. In overall reading achievement, the first-grade students who did not participate outperformed those who did. However, there was no significant difference in reading fluency achievement between the first-grade students who participated in the i-Ready CAI program and first-grade students who did not participate.
CHAPTER I

INTRODUCTION TO THE STUDY

Background of the Study

The increasing number of elementary children who struggle with reading has become a significant challenge for the nation’s public schools. Studies indicate it is very hard for struggling readers to catch up. Unfortunately, there are numerous implications for struggling readers; many who participate in special education receive long-term remedial services, or experience grade retention. Further, as they transition through the grade levels, the academic distance between those who read well become more pronounced (Learning First Alliance, 1998; National Reading Panel, 2000; Rashotte, Toregesen, & Wagner, 1997; Torgesen & Burgess, 1998).

As a result, school systems continue to search for intervention programs that can improve reading achievement. Meanwhile, teachers are creating new units and assessments to meet the new common core standards and searching for quality programs that aid in increasing student achievement, not to mention publisher materials that address the standards are very difficult to find.

As technology advances and becomes more affordable, schools supplement teacher instruction to improve student learning (Song & Keller, 2001). Instructional software programs are used to identify reading skill areas where students are struggling and assign personalized lessons aimed to fill in the gaps. Students receive whole group instruction, and specific individualized instruction through Computer
Assisted Instruction (CAI; Song & Keller, 2001). Research has indicated that structured reading instruction is necessary for struggling readers (Foorman & Torgesen, 2001). Computerized reading programs are very systematic in their approach to instruction (Song & Keller, 2001). Also, teachers select computerized reading instruction as a diagnostic tool (Song & Keller, 2001). School districts are considering implementing computerized reading instruction programs as a significant intervention that provide systematic, progressive instruction, and specific diagnostic reports (Song & Keller, 2001). In theory, computerized instruction differentiates lessons to meet the individual needs of students, a task that can be difficult for teachers because of time constraints (Robinson, Maldonado, & Whaley 2014).

**Statement of the Problem**

School districts have invested in numerous reading interventions over the past two decades. Nevertheless, why are so many elementary students below grade level? According to the most recent National Assessment of Educational Progress (NAEP), fewer than half of fourth-grade students (42%) scored at or above the proficient level in reading (National Center for Education Statistics [NCES], 2011). The results were more troubling for minorities and English learners. Whereas 55% of white students achieved at or above proficient on the NAEP, only 19% of African Americans, 21% of Hispanics, and 3% of English learners scored at the same level.

Over the past 20 years, educators have embarked on approaches such as small group instruction, computer assisted instruction, direct instruction, one-on-one tutoring and early childhood education programs. Among these approaches,
technology-assisted applications have become one of the most popular (Cheung & Slavin, 2012; Kulik, 2003). Teachers recognize the importance of individualized instruction. A classroom requires exceedingly divergent instruction in order for all students to learn. As a result, teachers may ask themselves, “How can I find the time to differentiated instruction to meet the needs of all learners?” or “What learning tools do I have that are applicable to meeting the needs of all my students?” The answers to these questions have always been a challenge for teachers. Teachers must be innovative, persistent and knowledgeable in all academic areas in order to meet all of their students’ individual needs. One tool a majority of teachers have access too is the increasing availability of computers, software programs, and other technologies. The advancement of technology today, offers personalized instruction, immediate feedback, learning connected to current curriculum, and careful monitoring and assessment (Blok, Oostdam, Otter, & Overmaat, 2002). Currently there is a wide range of software packages marketed to schools. Selecting the program that can make a significant difference in learning for students is not an easy task for educators. A successful program should provide a diagnostic tool that assesses all students and provides data useful to developing individualized instructional plans and monitoring progress. Also, effective programs must provide students with auditory, visual and tactile-kinesthetic approaches to learning. Carlisle and Rice (2002) wrote that computer assisted instruction was primarily developed to increase instructional time and practice for students in addition to the direct instruction provided by the teacher.
Research Question

What are the effects of the i-Ready supplemental English language arts (ELA) program on the reading achievement of first graders?

Null Hypotheses

1. There is no significant difference in reading achievement between first-graders who participated in the i-Ready program and first-graders who did not participate while controlling for pre-existing differences.

2. There is no significant difference in fluency achievement between first-graders who participated in the i-Ready program and first-graders who did not participate while controlling for pre-existing differences.

Significance of this Study

The most important criterion for success in the early elementary years is learning to read. Without attaining literacy proficiency, knowledge in other academic fields is hindered and opportunities in society are limited (Kutner et al., 2007; Morrison, Bachman, & Connor 2005; U.S. Department of Education [DOE], 2010). The purpose of this study is to determine the effectiveness of the i-Ready computerized reading program in improving the reading achievement of first graders. The results of this study may provide additional information regarding the effectiveness of CAI.
Limitations

This study will be limited to 80 first grade students who were enrolled at an elementary school in the Central Valley of California during the 2014–2015 school year.

Delimitations

For the purpose of this study, the gender, socio economic status and ability levels of the students and experience of the teachers were not taken into consideration.

Definition of Terms

*Computer-assisted instruction (CAI).* An interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place. CAI uses a combination of text, graphics, sound and video in enhancing the learning process.

*Differentiated instruction.* A variety of instructional approaches that address the diverse learning styles of students. Teachers differentiate by modifying the content (what is being taught), the process (how it is taught) and the product (how students demonstrate their learning).

*Fluency.* The ability to read with speed, accuracy, and proper expression. In order to understand what they read, children must be able to read fluently whether they are reading aloud or silently. When reading aloud, fluent readers read in phrases and add intonation appropriately.
Summary

Chapter I presented the purpose, the research question, the hypotheses, and the significance of this study. Additionally, limitations, delimitations, and terms and definitions were presented. Chapter II will present a review of the literature that is pertinent to computerized supplemental reading programs.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of this study was to determine if i-Ready a Computer Assisted Instruction (CAI) program increases reading achievement. This chapter will examine CAI programs that have been implemented in classrooms to increase reading achievement.

Background

According to the National Assessment of Educational Progress (NAEP), roughly one-third of the U.S. students read at or above the proficient level; one-third read at the basic level; and one-third read at the below basic level. As a result, two of every three students in the U.S. do not read at a level required to adequately perform grade-level work (Rampey, Dion, & Donahue, 2009).

For a child to adequately learn to read proficiently, four core cognitive capacities are needed: memory, attention, decoding skills, sequencing, and processing efficiency (speed and accuracy; Burns, 2012). According to Blok et al. (2002), reading problems emerge commonly from inadequate decoding skills. Furthermore, the authors stated that a child must master two aspects of the alphabetic code: visual identity of letters and the speech sounds of letters (phonemes). As a result, once students master the essentials, they are on the road to successful writing, speaking and reading.
Phonological awareness involves identifying similarities between communicating words, counting syllables, and creating rhyming words. Once phonological awareness is mastered, students are able to develop the skill called phonemic awareness. Phonemic awareness is the ability to hear, identify, and manipulate individual phonemes in spoken words. Specifically, phonemic awareness is the ability to identify and categorize sounds, blending sounds to form words and delete or add sounds to form new words. Therefore, students are less likely to struggle with reading if they have the ability to hold on to those sounds, blend them successfully into words, and take them apart. As a result, there is a vital connection between phonological awareness and success in learning to read (Juel, 1991; Scarborough, 1989; Stanovich, 1986; Wagner, Torgeson, & Rashotte, 1994). Furthermore, recent meta-analyses of various studies on reading development demonstrate that phonemic awareness aids students in developing into fluent readers (Bus & van IJzendoorn, 1999; Ehri et al., 2001). Also, phonemic awareness helps students pronounce difficult words which improves reading comprehension (Bruck, 1998; Metsala & Brown, 1998; Snowling, Goulandris, & Defty, 1998).

When a word begins or ends with more than one consonant, segmenting and blending tend to be a struggle for students (Hempenstall, n.d.). As students become familiar with corresponding speech sounds or phonemes, they can manipulate phonemes through blending and segmenting. In addition, to become good writers and spellers, students must segment words into separate phonemes (Adams, 1990).
Studies on Computer Assisted Instruction (CAI)

Ness, Couperus, and Willey (2013) conducted a study on the efficacy of a CAI program known as Lexia. The Lexia reading program was designed to improve reading skills. The program could be utilized to supplement reading instruction. Students take a Lexia reading program assessment and based on the results, individualized interactive activities are prescribed that build skills in phonemic awareness and phonics. In addition, the program also provided individualized lessons on vocabulary, fluency and comprehension.

The participants consisted of students who attend a primary school in New Zealand. The students were identified by the school as at-risk in terms of their literacy which was two or more years below their chronological age. Ten students from each class were randomly assigned to the experimental or control group. Two students with English as a second language were excluded from the study because they left the school, leaving a total of 37 participants, 19 in experimental group and 18 in the control group. Both groups participated in the core reading program. In addition to the core program, the experimental group participated in the Lexia reading program for at least 100 minutes per week for a single school term in 2010 (Ness et al., 2013).

Data were derived from a pre and post test and used in a quantitative analysis. The pre and post tests were used to determine achievement in fluency, comprehension, spelling and pseudo decoding. When independent sample t-tests were used to compare the pre and post test data generated from the four WIAT-II
subtests, no significant difference was found between the experimental group and the control group (Ness et al., 2013).

Borman, Benson, and Overman (2009) conducted a quantitative study involving eight Baltimore City public schools to determine if the Fast ForWord language program improved literacy skills of students who were at-risk. The study compared the language and reading outcomes of 205 second and seventh-grade students who participated in the Fast ForWord language program, in addition to the core literacy-based program that both groups received. The control group consisted of 210 second and seventh grade students who received the core literacy-based program without supplemental support.

The authors conducted a comparative ITT analysis on data derived from the pre and post test on the language and reading comprehension sections of the Comprehensive Test of Basic Skills, Fifth Edition (CTBS/5) Form A and B. Their findings concluded second and seventh graders who used the Fast FordWord language program did not make significant gains in reading achievement when compared to the control group (Borman et al., 2009).

Mitchell and Fox (2001) completed a quantitative study to compare the effects of CAI and teacher-delivered instruction on the phonological awareness of at-risk kindergartners and first-grade students. The purpose of the study was to determine if phonological awareness can be enhanced through CAI.

The study took place in the Johnston County School System and involved 36 kindergarten and 36 first-grade at-risk students from six classrooms at each grade
level. The children were classified at-risk based on teacher observations of low reading ability in the classroom, vocabulary development as determined by the Peabody Picture Test-Third Edition and performance on a school district-designed informal reading inventory called the Literacy Initiative for Everyone (Mitchell & Fox, 2001).

There were 24 children in each of the three treatment groups that consisted of 12 kindergartens and 12 first graders per group. The children were randomly assigned to groups. The experimental group was exposed to two phonological awareness software programs. The first was Daisy Queset which provided instruction and practice in rhyme identification and the identification of beginning, middle and ending sounds in words. The other software program used by the experimental group was Daisy Castle which teaches and reinforces segmenting words into individual phonemes and blending. The experimental group participants were not exposed to explicit phonological awareness instruction during the four-week period of the study. The experimental group received 5 hours of phonological awareness instruction in 20-minute sessions on the computer during the 4-week period (Mitchell & Fox 2001).

There were two control groups. The first control group received direct teacher-delivered phonological awareness instruction for five hours in 20-minute sessions during the four-week period. The second control group was did not receive direct phonological awareness instruction from a teacher nor a computer program. The second control group was given an opportunity to freely explore mathematics for 5 hours in 20-minute sessions during the 4-week period (Mitchell & Fox 2001).
An analysis of covariance (ANCOVA) on the pre and posttest data showed that there was no significant difference between the experimental group that received 5 hours of phonological awareness instruction on the computer and the control group that received teacher-delivered phonological awareness instruction. However, results showed the control group that received teacher-delivered instruction \((p < .0001)\) and the experimental group \((p < .0001)\) that received 5 hours of phonological awareness instruction on the computer had significantly higher total phonological awareness scores than the second control group that did not receive any instructional phonological awareness via the computer program or teacher (Mitchell & Fox, 2001).

Todtfeld and Weakley (2013) conducted a quantitative study on the effectiveness of the iReady, CAI reading program, in New Middletown, Ohio. The study followed third, fourth and fifth grade students enrolled in the same elementary school over a 3-year period. They used archival test data from the academic years, 2011, 2012 and 2013. The control group participated only in the core reading program and did not receive computerized assisted instruction. The experimental group received iReady supplemental instruction in addition to the core reading program in 2013. An analysis of variance (ANOVA) was used to analyze the data of third through fifth grade students who did not use the iReady program during the 2011 and 2012 school year via the third through fifth grade students who did use the iReady program during the 2013 school year. The results showed there was no statistically significant difference between the students who received iReady intervention and those who did not receive the intervention.
Powers and Price-Johnson (2006) conducted a study to evaluate the effectiveness of the Waterford Early Reading Program (WERP) CAI program on improving reading achievement. The purpose of this study was to determine whether or not there was a difference in reading achievement between students who participated in the WERP program and students who did not. The study involved 15 Title 1 Tuscon Elementary schools. A total of 1,211 kindergarten students participated in the control group. The control group only received the core reading program and did not receive any WERP computer assisted instruction. The experimental group consisted of a total of 358 kindergartners who participated in the WERP program in addition to the core reading program for a 6-month period.

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS), a standardized assessment, was administered to all kindergartners in the district during the beginning, middle and end of the school year. Scores were reported as raw scores. The authors used an ANCOVA on the beginning and end of the year test data. The level of significance was set at .05. The experimental group scored significantly higher than the control group \( (p < .05) \). The results of the study showed the iReady program had a positive effect on students (Powers & Price-Johnson, 2006).

Macaruso, Hook, and McCabe (2006) conducted a study on the efficacy of computer-based supplementary phonics programs for advancing reading skills of at-risk Title 1 elementary students. Study participants were first-graders in 10 classrooms spread across five schools in a Massachusetts public school district. In each school there was one experimental classroom and one control. Eighty-three
students in the five treatment group classrooms participated in Lexia, a computerized supplementary reading program. In addition to the language arts core program, the treatment group students received two to four weekly sessions of 20 to 30 minutes each. The 84 students in the five comparison group classrooms received the language arts core program during that time without the supplemental computer support. In the study, intervention students were exposed to two Lexia components: Phonics Based Reading (PBR) and Strategies for Older Students (SOS). The PBR component has 3 levels, 17 skill activities, and 174 units covering basic phonics skills usually taught in Grades 1 through 3. After finishing PBR activities, students were introduced to SOS activities, which consist of 5 levels, 24 skill activities, and 369 discrete units. The intervention classes used Lexia software for approximately six months, with children completing an average of 64 sessions and 140 skill units. Most students worked on PBR activities only; 14 students (17%) in the intervention programs advanced to SOS activities, working mainly on early levels.

The authors completed two comparison analyzes using pre and post test scores from the Gates-MacGintie Reading Test, Level BR. The first comparison analysis showed students in the treatment group outperformed the students in the control group, but the difference between groups was not significant. However, an ANCOVA comparing post-test scores for the two groups (with the pre-test scores as a covariate showed a significant difference favoring the treatment group, $F(1, 27) = 6.0$, $p = 0.02$. Students in the treatment group performed significantly higher than
students in the control group. In fact, students in the treatment group reached achievement levels comparable to non-Title I status (Macaruso et al., 2006).

Englert, Yong, Collings, and Romig (2005) conducted a study to determine the effects of internet-based software on the reading performance of students who were at-risk of school failure. In Study 1, internet-based software from the TELE-Web project was used to remediate the word recognition performance of four first grade students at risk of retention because of reading disabilities. In Study 2, the internet-based software was used with an entire classroom of first-grade students.

In Study 1, the performance of the group of at-risk students with 160 minutes of independent reading practice on TELE-Web over 4 weeks experienced an average gain of 4 months of reading improvement on a standardized test. In Study 2, an entire classroom of students with only 160 min of independent reading practice on TELE-Web over 4 weeks, showed a dramatic boost in reading performance. The descriptive results suggested that TELE-Web was effective in improving sight word recognition (Englert et al., 2005).

Chambers et al. (2011) conducted a quantitative study to determine the effects of a CAI program. This program was administered to small groups and individualized tutoring was provided to struggling readers. The researchers also wanted to know if small group tutoring was more effective than one-on-one tutoring.

The study took place in 33 high-poverty schools located in nine states (Georgia, Massachusetts, Texas, Washington, Oregon, Mississippi, Florida, Pennsylvania and Colorado). A total of 195 first and 177 second-graders participated
in the experimental group and a total of 171 first and 103 second-graders participated in the control group. Each student was randomly assigned to a group. The Woodcock-Johnson Letter-Word identification scale was used as a pre test administered to every first and second grade student. The experimental group received Team Alphie, the computer assisted program, and the control received one-to-one tutoring (Chambers et al., 2011).

In the experimental group schools, students were tutored in groups of six using the Team Alphie CAI program. Students received 45 minute daily sessions of instruction four times per week (Chambers et al., 2011).

In the experimental group, students paired up with one another. The students were assessed using the computer program assessment to determine what type of CAI would be needed to help improve their reading skills. According to the results of the assessment, a 2-week plan based on the partner with the lowest results was prepared. Both students worked together at a computer, taking turns as “reader” and “coach”. The computer posed a question or a task, and after the “reader” entered an answer, the computer presented the correct response and the “coach” indicated whether or not the reader’s response matched the computer’s. When the 2-week period concluded, a new plan was generated based on the pair’s performance activities (Chambers et al., 2011).

In the control group, students were tutored for 20 minutes daily with a certified teacher using standard individualized tutoring using Success for All. The one-on-one tutoring sessions focused on the skills that needed remediation. The skills
consisted of auditory blending and segmenting, letter-sound correspondence, and word blending. In addition, students practiced reading decodable stories to improve fluency (Chambers et al., 2011).

An analysis of covariance was conducted utilizing pre and post test data generated from the Woodcock-Johnson III Tests of Achievement. The authors concluded that the first grade treatment group significantly out performed the control group on all three adjusted reading measures of the Woodcock-Johnson III Tests of Achievement LWID (ES = +0.17; \( p = .05 \)), WA (ES =+0.21; \( p = .04 \)), PC (ES = +0.15; \( p = .05 \)). However, there was no significant difference between the second-grade treatment and control groups (Chambers et al., 2011).

**Summary**

Several studies on the effectiveness of CAI programs on reading achievement were presented in this chapter. In Chapter III, this author will describe the methodology of the present study which includes the population sample, instrumentation and data collection and the statistical analysis.

Chapter II consisted of a review of the literature regarding the effects of extracurricular participation on academic achievement. Chapter III will present the methodology and procedures used in this study.
CHAPTER III

METHODS AND PROCEDURES

Introduction

The purpose of this study was to determine if i-Ready, a Computer Assisted Instruction (CAI) program, increases reading achievement. This chapter will provide a description of the sample population, the treatment and control groups, and the statistical analysis.

Sample Population

This quantitative study was conducted at an elementary school located in a school district in the Central Valley of California during the 2014–2015 academic year. During the study, there were 579 elementary students enrolled in the school. The ethnic composition of the students was 77% Hispanic, 16% Caucasian, 1% Asian, 2% African American and 4% other. The gender ratio was 53% male to 47% female. Eighty first-grade students for this study represented the total population were enrolled during the 2014–2015 academic year.

Treatment Group

The treatment group consisted of two first grade classes \((N = 40)\). Two of the four first-grade teachers from the same school volunteered to have their students participate in the i-Ready program. Students who participated in the i-Ready program, also participated in the daily core English language arts (ELA) program. The treatment group took a pre i-Ready reading diagnostic test. The results from the
i-Ready reading diagnostic test provided the teachers with each student’s reading level, pinpointed each student’s sub skill needs and customized instruction according to each student’s placement level. The treatment group participated in i-Ready for 20-minute sessions 3 times a week for 6 consecutive weeks.

**Control Group**

The students of the other two first-grade teachers did not participate in the i-Ready program. The control group \((n = 40)\) received instruction in the daily core ELA program without computer assisted instruction.

**Instrumentation**

The i-Ready diagnostic reading and Open Court Fluency assessments were used as pre and posttests for both the control and experimental group to determine if differences in reading achievement existed between the two groups. The i-Ready diagnostic reading assessment was administered on a computer and the Open Court Fluency assessment through traditional paper and pencil means was administered by the classroom teacher.

**Statistical Analysis**

An analysis of covariance (ANCOVA) was used to determine if there was a significant difference in reading achievement between first-grade students who participated in the i-Ready reading program and first-grade students who did not participate in the i-Ready reading program while controlling for preexisting differences. The alpha level was set at the .05 level of significance.
Summary

Chapter III presented and discussed the sample population, instrumentation and data collection, and the statistical analysis. Results of this study are reported in Chapter IV.
CHAPTER IV

RESULTS

Introduction

The purpose of this study was to determine if the i-Ready computer assisted instruction (CAI) program improves reading achievement and fluency. This chapter will present the results of the analysis of covariance (ANCOVA) that was used to accept or reject the null hypotheses of this study.

Findings and Discussion Related to Hypotheses

Null hypothesis: There is no significant difference in reading achievement between first-graders who participated in the I-Ready program and first-graders who did not participate.

An ANCOVA was used to analyze the data and determine if there was a significant difference in overall reading achievement between first-grade students who participated in the i-Ready CAI program and first-grade students who did not participate in the i-Ready CAI program when controlling for preexisting differences. The level of significance was set at .05 (see Table 1).
Table 1

*Reading Achievement: First Grade Students Who Participated in the i-Ready CAI Program and First Grade Students Who Did Not Participate*

<table>
<thead>
<tr>
<th>Group</th>
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<th>M</th>
<th>SD</th>
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<tr>
<td>Control</td>
<td>40</td>
<td>422.83</td>
<td>44.363</td>
<td>7.938</td>
<td>.006*</td>
</tr>
<tr>
<td>Treatment</td>
<td>40</td>
<td>416.08</td>
<td>47.878</td>
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*p < .05

The results suggest that the first-grade students who did not participate in the i-Ready program significantly outperformed the first grade students who participated in the i-Ready program when controlling for preexisting differences.

Null hypothesis: There is no significant difference in fluency achievement between first-graders who participated in the i-Ready program and first-graders who did not participate.

An ANCOVA was used to analyze the data and determine if there was a significant difference in fluency between first-grade students who participated in the i-Ready CAI program and first-grade students who did not participate in the i-Ready CAI program when controlling for preexisting differences. The level of significance was set at p < .05 (see Table 2).

Table 2

*Reading Fluency: First Grade Students Who Participated in the i-Ready CAI Program and First Grade Students Who Did Not Participate*

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>40</td>
<td>57.85</td>
<td>27.740</td>
<td>.948</td>
<td>.333</td>
</tr>
<tr>
<td>Treatment</td>
<td>40</td>
<td>51.18</td>
<td>30.975</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The results suggest there was no difference in reading fluency between first-grade students who participated in the i-Ready program and first-grade students who did not participate in the i-Ready program.

**Summary**

Chapter IV presented the results of the ANCOVA that were used to accept or reject the null hypotheses of this study. Chapter V will present a summary, conclusions, implications and recommendations for further research.
CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

The purpose of this study was to determine if the i-Ready computer assisted instruction (CAI) program improves reading achievement and fluency. Chapter V is divided into four sections: summary, conclusions, implications, and recommendations for further study.

Summary

State and federal reforms have placed demands on school districts to have students demonstrate mastery of reading fluency and comprehension. Teachers are struggling to find effective supplemental reading programs. Therefore, school districts are searching for programs that assist teachers in differentiating instruction for the purpose of increasing reading achievement. The i-Ready CAI program provides additional help for students to independently practice phonological, decoding and comprehension skills. An analysis of covariance (ANCOVA) was performed on the pre and post reading assessment data of first-grade students who participated in the i-Ready CAI program and students who did not. In overall reading achievement, the students who did not participate outperformed the first-grade students who did. However, there was no significant difference in reading fluency achievement between the first-grade students who participated in the i-Ready CAI program and first grade students who did not participate.
Conclusions

This study suggests that the i-Ready CAI program does not improve reading achievement, which supports the results of other studies on the effectiveness of CAI. Ness et al. (2013) conducted a study on the effects of a CAI program known as the Lexia Reading program on 40 at-risk students. A WIAT-II pre-test was given at the beginning of the school year and at the end of the year. The results showed there was no significant difference between the experimental and control group. Borman et al. (2009) conducted a study on the CAI Fast ForWord language program to compare language and reading outcomes of 205 second and seventh-grade students. The experimental group utilized the CAI Fast ForWord language program throughout the school year, while the control group did not. The authors conducted a comparative ITT analysis on data derived from the pretest and posttest on the language and reading comprehension skills sections of the Comprehensive Test of Basic Skills, Fifth edition (CTBS5) Form A and B. Their findings suggested that second and seventh-graders who used the Fast ForWord Language program did not outperform second and seventh graders in the control group.

Implications

An effective supplemental reading program must include the five components of literacy (phonemic awareness, phonics, fluency, comprehension and vocabulary). Reading CAI programs that have the five components of literacy, is one promising solution to improving reading achievement. However, this study on the i-Ready CAI
program and others have found that a supplemental CAI reading program is not always effective in boosting students’ reading achievement.

According to Gambrell, Morrow, Neuman, and Pressley (1999), the rate of grasping information presented in text depends largely on one's prior knowledge of the content. Students who struggle with reading often have limited prior knowledge and experiences. For that reason, it is paramount teachers provide opportunities for students to increase their background knowledge through whole class discussions before students are presented with text that is foreign to them. Unfortunately, the experimental group who used i-Ready during this study was not given opportunities to engage in verbal interaction with others before they completed their i-Ready lessons. In addition, the experimental group did not master the reading skills that were taught in isolation. The i-Ready CAI program does not provide opportunities for students to engage in verbal interactions for the purpose of reinforcing skills. McCormick (1999) showed students need plenty of opportunities to practice new skills before mastery. The reading skills that were being taught to the experimental group through i-Ready were conducted in isolation and were not reinforced throughout the day during core instruction. Consequently, students in this study may have experienced difficulty in retaining the reading skills that were taught through the i-Ready program. As a result, the experimental group was not successful in efforts to improve reading achievement.

The author recommends utilizing the i-Ready CAI program to reinforce what is being taught during core instruction. Through the process of integrating i-Ready
into the core instruction, teachers utilize weekly assessment data to track student growth and make adjustments to address individual student learning needs.

In response to the results of this study this author recommends utilizing i-Ready to reinforce what is being taught during the core instruction. Through the process of integrating assessments, core instruction and i-Ready lessons. Educators will utilize assessment data to track student growth, recognize students who need a challenge, students who are reading at grade level or who are not demonstrating adequate progress and need more intensive intervention. i-Ready educators can continually use data to ensure they are meeting the needs of all students by utilizing the classroom assigned instruction part of i-Ready. Educators assign lessons that are above, on and below grade level to reinforce what is being taught during core instruction at that particular time. Therefore, students are not learning new skills in isolation.

**Recommendations for Further Research**

1. Conduct a quantitative study on the i-Ready CAI program with a larger sample size across grade levels to determine if there are significant differences in reading achievement between participant and nonparticipant groups.

2. Conduct a qualitative study that examines teacher perceptions of the effectiveness of the i-Ready CAI program.

3. Conduct a quantitative study on the i-Ready CAI program to determine if significant statistical differences in reading achievement exist between districts in the Central Valley of California that have implemented the
program and districts in the Central Valley of California that have not implemented the program.

4. Conduct a quantitative study on the i-Ready CAI program to determine if there is a difference in reading achievement between students who received instruction in a class where the program was integrated into the core program and students who received i-Ready in isolation.
REFERENCES


