WEB APPLICATIONS USED FOR LITERACY LEARNING IN FIRST GRADE

A Thesis

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by

Jennifer Blankenfeld

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WEB APPLICATIONS USED FOR LITERACY LEARNING IN FIRST GRADE

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by

Jennifer Blankenfeld

Approved by:

Porfirio Loeza, Ph.D., Committee Chair
Stephanie Biagetti, Ph.D., Second Reader

Date
Student: Jennifer Blankenfeld

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Susan Heredia, Ph.D.  Date

Graduate and Professional Studies in Education
Abstract

of

WEB APPLICATIONS USED FOR LITERACY LEARNING IN FIRST GRADE

by

Jennifer Blankenfeld

Statement of Problem

This thesis examined technology dedicated to literacy learning used by first-grade students at a Northern California school and was unified by the guiding question: what is the effectiveness and intended use of computer-based literacy programs? The guiding question led the researcher to ask three additional questions: a) How are students motivated to use computer-based literacy programs?, b) How are the assessment data used by the teachers to monitor student growth?, and c) How appropriately are students placed within each program? Furthermore, the research surveyed overall teacher satisfaction when using computer-based literacy programs.

Sources of Data

Data were collected from three first-grade teachers and 16 first-grade students in a suburban elementary school located in Northern California. The three first-grade teachers used trimester benchmark assessments obtained through the district to gather formal reading data regarding words per minute (WPM), accuracy, and comprehension. The teachers also used two computer-based literacy programs, Raz-Kids.com (A-Zlearning.com) and Accelerated Reader (Renlearn.com), to supplement and enhance the
reading curriculum and to obtain further formal assessment data. The researcher obtained
the quantitative data through student reports from Raz-Kids.com, Accelerated Reader,
and the trimester benchmark assessments for the 16 students. The three first-grade
teachers were also asked to complete an initial survey and follow-up questionnaire to
obtain qualitative information regarding use, motivation, and overall satisfaction for the
supplemental computer-based literacy programs.

Conclusions Reached

The data obtained indicated that the use of computer-based literacy programs is
beneficial when there is appropriate training and placement. Finally, the study revealed
that most students are extrinsically motivated while using computer-based literacy
programs and the formal assessment data further gathered strengthens the ability to
correctly obtain student reading levels and instructional needs.

________________________________, Committee Chair
Porfirio Loeza, Ph.D.

__________________________
Date
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Chapter 1

INTRODUCTION

Teachers utilize a variety of assessments and supplemental curriculum to ensure students are reading at an instructional or independent level and that tier-appropriate vocabulary are being introduced. With computers becoming more and more popular in the learning environment (Hsieh & Dwyer, 2009), the use of computer-based literacy programs has become a necessary learning tool that supports the classroom curriculum. This thesis examined the use of two computer-based literacy programs, Raz-kids.com and Accelerated Reader, both utilized as reading curriculum extensions in the first-grade classrooms at one school site and unified by the guiding question: what is the effectiveness and intended use of computer-based literacy programs? The guiding question led the researcher to ask three additional research questions: a) How are students motivated to use computer-based literacy programs?, b) How are the assessment data used by the teachers to monitor student growth?, and c) How appropriately are students placed within each program? The researcher also surveyed three first-grade teachers for overall satisfaction when using computer-based literacy programs.

Statement of Purpose

Raz-kids.com and Accelerated Reader are two computer-based programs used to enhance the language arts curriculum. Both programs provide additional support for reading at an instructional and independent level and enhance classroom curriculum with technology aimed at supporting literacy growth and motivation. Students are able to
utilize the benefits of each program at home and strengthen the school-to-home connection. Parents are able to receive reports, emails, or access the programs at home to further benefit the literacy learning taking place. These computer-based literacy supplements create opportunities for additional student literacy learning.

Raz-kids.com, designed by Learning A-Z, Inc., is a web-based program incorporating reading and listening to texts with corresponding comprehension quizzes. The program offers 27 different reading levels with texts for grades kindergarten through five. The texts provide students with opportunities to listen to a story, read a story aloud, and record their readings (Klein, 2008). Additionally, students can take interactive quizzes to check their comprehension (Klein, 2008). They earn points for each book they read and can use these points to purchase pieces to build a colorful and personalized rocket. Raz.kids.com provides the teacher with an opportunity to monitor the amount of student activity and keeps track of quizzes taken and any missed skills the student had when taking the quiz. Teachers, parents, and students are capable of following the student progress through each level.

Accelerated Reader, a program developed by Renaissance Place, is a program that levels books and assesses students to determine the level of student comprehension and the amount of reading each student is completing independently over time. Students use classroom computers to take online quizzes after reading actual books from school, home, or classroom libraries. The books selected are ranked in reading levels that fit into grade equivalent scores of 1.0 to 12.0 (Magnolia Consulting, 2010). The quizzes are
tools used by teachers to assess key comprehension and vocabulary skills. Teachers help students choose books that have been deemed appropriate, per Accelerated Readers quiz scores and book-level recommendations, for the students’ individual reading needs. Students read the books independently and then take the quizzes to determine comprehension. Teachers, parents, and students can monitor scores and observe growth over time. Teachers can use scores to provide additional instruction in comprehension strategies if needed (Magnolia Consulting, 2010).

This thesis examined the use of the two computer-based literacy programs, Razkids.com and Accelerated Reader, by first graders in a single classroom at one elementary school site. Three first-grade teachers were also surveyed and interviewed to find out about the nature and adequacy of placement, if and how students were motivated by the specific programs, and how assessment data were used to monitor student growth. Adequacy of student placement within Raz-kids.com and Accelerated reader was examined by comparing trimester district benchmark data to the computer-based assessments from both programs. The data were gathered from one classroom of first-grade students and included accuracy and fluency assessment scores on district benchmark reading passages. The placement and progress reports from Accelerated Reader and Raz-kids.com were also utilized.

**Significance of Problem**

Accurate placement, encouragement, and maintenance of independent reading practice are critical components of developing fluent readers and increased
comprehension in students in the primary grades. To provide such independent reading practice, the use of technology-based programs has been increased. Technology is an apparatus rendered useful for literacy learning, a motivational device used to increase the amount of recreational reading, and a tool for enhanced parent communication. As such, this research sought to understand the effectiveness and intended use of these online technology assisted literacy programs. More research, however, on the effectiveness of computer-based instruction is needed. According to Baker (2007), little is known about the effectiveness of many of the programs used online. It is important teachers fully understand the intended use of each site and how to utilize these computer-based programs to support classroom instruction and assessment (Karchmer, 2001).

Definition of Terms

Computer-based Programs

Computer-based programs are websites and installed programs used for student learning. The websites and programs enable students to control their learning and be prepared for a society dominated by technology (Erdner, Guy, & Bush, 1998). Students use personal computers, iPads, and gaming machines, like Nintendo and PlayStation, to interact with the different program options.

Extrinsic Motivation

Extrinsic motivation is the pressured desire to complete a task because there is an opportunity to receive an award or prize (Logan, Medford, & Hughes, 2011). This type of behavior is present because a task is determined to be rewarding in
some way (Deci, Vallerand, Pelletier, & Ryan, 1991). Students may receive stars on a chart or add marbles to a jar that can eventually result in a party or treat given to them for successful completion.

**Intrinsic Motivation**

Intrinsic motivation involves “the dual qualities of enjoyment or interest in performing an activity, such as reading, and the disposition or intention to participate in the activity when it is appropriate” (Guthrie & Wigfield, 2000, p. 407). Self-concept and reading skill play a role in this type of motivation (California Department of Education [CDE], 2007). If students find a book in a series they enjoy and can read without much difficulty, then they may read the entire series. Their enjoyment and success motivate them to read the series, rather than the extrinsic rewards. Students who have intrinsic motivation will typically put forth effort without being told (Logan et al., 2011).

**Readability**

Readability measures the ease of the text to be read based on an individual student’s reading ability level and interests (Tanaka-Ishii, Tezuka, & Terada, 2010). When students read a text, it is necessary they are appropriately translating the print to meaning and understanding the context (Hiebert & Sailors, 2009) while they are intrinsically motivated to continue reading. Readability is typically thought of as a numerical score that informs the reader of the text’s difficulty (Fry, 2002).
**Reading Accuracy**

Reading accuracy is the portion of words read correctly during a set amount of time. The data are measured in the number of words read correctly over the number of possible words within a set (Pressley, 2006) and recorded as a percentage.

**Reading Automaticity**

Reading automaticity involves reading most words quickly, effortlessly, and without intention (Kuhn, Schwanenflugel, & Meisinger, 2010). Reading automaticity is measured in correct words per minute (CWPM). The rate indicates how many correct words per minute the student can read and can be compared to the district benchmarks set for each grade level and trimester. Automaticity is also thought of as reading that is rapid and effortless (CDE, 2007). This fluent and prosodic reading with very few, if any, errors is key to allowing students to gain a more complete comprehension of the reading content.

**Reading Benchmarks**

Reading benchmarks are guidelines typically consisting of student growth measures including graded reading passages that assess students' accuracy, fluency, and comprehension. Benchmark assessments are typically given at the end of each trimester and are guided by the district and state standards. They guide teachers with placement and with interventions that may need to occur.
Teachers are asked to give assessments by the principal or by the district office but can vary in requirement by location.

**Reading Fluency**

Reading fluency results from routine reading practice and consists of three components: accuracy, automaticity, and prosody (National Institute of Child Health and Human Development [NICHD], 2000). These three components allow readers to focus on comprehension rather than decoding (CDE, 2007). The three components are demonstrated through oral reading and are a factor in future comprehension (Kuhn et al., 2010).

**Limitations**

The school focused on in this research is a high achieving school with a very high rate of parent volunteers. The parents typically have education beyond high school and have high expectations for their children. This study may not be generalizable to more diverse populations and settings. Generalizability was further limited by portions of the data collected from only 16 students in one classroom environment. Finally, the completion of this research took two years and the gap in time also limits the generalizability of the research. The initial data was collected at the end of the students’ first-grade school year and the teacher follow-up interviews were done two years later.

**Organization of the Thesis**

This thesis contains five chapters. Chapter 1 introduces the topic and its significance, defines the terms, and explains the study’s limitations. Chapter 2 reviews
the literature associated with computer-based instruction, reading fluency development, motivation, and the nature and readability of reading practice materials for primary grades. Chapter 3 covers the methodology for this thesis. Chapter 4 presents and discusses the results and expresses conclusions. Lastly, Chapter 5 offers recommendations and future opportunities for research.
Chapter 2

LITERATURE REVIEW

For computer-based literacy programs to be successful, teachers must understand the research that has been previously carried out and how it applies to their individual students. Such understanding, acquired through professional development and teacher trainings, will guide instruction and increase the odds that best practices are used to achieve student advancement. The use of supplemental reading materials, including computer-based literacy programs, should be used after thoughtful consideration. Primary-grade students are eager to learn, but reading materials should be at an appropriate level and should lead to an intrinsic motivation for increased reading time. Computer-based literacy programs offer an opportunity for teachers to engage their students while monitoring their growth over time. This chapter examines the literature supporting the four areas explored in the thesis: reading fluency development, readability of reading practice materials, computer-based instruction, and motivation. The review supports the significance of the thesis, as well as the need for increased research and study on the topic.

Reading Fluency Development

Reading Fluency comes in three forms and has been defined as accuracy, rate, and prosody (CDE, 2007). When students can read with accuracy at a rate that allows for understanding of meaning and are able to reveal the prosodic tones within the text, they are considered fluent (Rasinski, Reutzel, Chard, & Linan-Thompson, 2011). However,
fluency is a challenging and multi-tasking skill requiring appropriate steps taught to allow for success (Fox, 2008). Vital to reading success, fluency in reading allows students to focus on comprehension and the necessary understanding of text rather than decoding.

Fluency was examined when Hiebert (2005) studied 115 students from three different schools and 13 different classrooms. The study replicated a previous study that examined classroom fluency practices. The intervention took advantage of the basal textbook program already implemented in the classroom. The three intervention groups were differentiated by the type of text used and repeated readings. The teachers also gained professional development opportunities prior to implementation. Through this study, Hiebert (2005) determined that the features and content of the text make a difference. Although the amount of reading and genre of text still needs to be examined further, the research done by Hiebert (2005) is essential to understanding fluency and taking steps toward successful reading practices.

Another study on fluency development conducted by Reis, Eckert, McCoach, Jacobs, and Coyne (2008) used a randomized design to examine increased fluency, disposition, and comprehension. They used a literacy enrichment program to enhance the current curriculum. The research involved 558 students from third through fifth grades and 31 teachers in two different New England elementary schools. Teachers were given a half-day professional development training to provide the materials and intervention process plans. The program was implemented by the teachers, and data were gathered by the researcher over a 14-week period. The results suggested increased fluency was
achievable through both a basal program alone and programs enriched with additional resources. The disposition and comprehension components had no significant changes. However, there was a sufficient correlation between the pre-fluency and post-fluency scores leading to the conclusion that future research is needed.

As with Reis et al.’s (2008) research, Kuhn and Stahl (2003) indicate that educators understand that a successful reader must decipher text and construct meaning from text. This process requires an abundant amount of practice. Oral reading supported by teachers or peers can help students increase reading fluency. Repeated oral practice allows for modeled fluency practice. Readers listen to the text being read in a fluent manner and are then allowed to practice the text for the opportunity to mimic this fluency. This type of instruction is specifically aimed at an increase in fluency (Rasinski et al., 2011). Students can also use computers to assist with fluency by listening to books read aloud or by recording themselves reading the story and then listening to their reading. The opportunity to listen to the story being read allows the student to hear what a fluent reader sounds like. The recording they make of themselves reading the passage provides opportunity to reflect on their own prosody and helps them work toward a more fluent reading of the books.

Prosody is an element of fluent reading that takes the reader from a more monotone and stagnant sound to a more melodic and rhythmic type of reading that is closer to that of everyday speech. Prosody has several features including pitch, duration, stress, and pausing (Kuhn et al., 2010). Prosodic readers may also have increased
comprehension (Schwanenflugel, Hamilton, Kuhn, & Stahl, 2004). It is important to understand that fluency can help students obtain comprehension but it is not an end to the process (Schwanenflugel et al., 2006).

**Nature and Readability of Reading Practice Materials for Primary Grades**

It is necessary to examine all aspects of learning to read when looking at first-grade materials. Primary-grade reading practice materials come in a variety of forms such as phonics readers, partner games, basal readers, magazines, and practice books copied from the textbook curriculum. The practice materials are dependent on the classroom, reading level, and students’ interests. The ideas behind the appropriate type of texts have swayed back and forth like a pendulum over the years. In 1993, school text adoptions considered literature more important than the decodable texts (Hiebert & Sailors, 2009). By 2000, decodable texts began to be considered the essential tool (Hiebert & Sailors, 2009). It is important to look at each aspect of learning to read before considering a text appropriate for students (Evans & Carr, 1985) and understanding that reading is a process one must learn through instruction in order to be fully developed (Evans & Carr, 1985). Students must have appropriate reading materials at the correct reading levels regardless of type.

An ability to understand vocabulary is also necessary in learning to read. Much of the familiar vocabulary for students is heard in oral language prior to reading (Beck, McKeown, & Kucan, 2002). This familiarity with vocabulary will help students with comprehension, but they must also have the ability to decode the written word when
encountered. Not all vocabulary will be understood, and those words that do eventually become familiar will need to be seen multiple times before students develop complete understanding (Beck et al., 2002). Students need repetition to help them remember what has been learned. Students also utilize learning schema and knowledge from prior years to help them store the new vocabulary and have the ability to recall it later. This prior knowledge will interact with the text structure and the purpose of reading (Birkmire, 1985) and will enhance the learning.

The repetitive nature to understanding vocabulary is also important in the earlier aspects of reading and must be noted when decisions about appropriate student texts are being made. Biemiller and Boote (2006) conducted research on building vocabulary in the primary grades. The researchers utilized classroom teachers in grades kindergarten through second grade. The teachers provided whole-class instruction using vocabulary embedded within stories. The researchers were able to pretest, modify vocabulary instruction to include meaning explanations, and select books that would be used in the lessons. This study noted differences in the gains dependent upon the classroom, even though each program was being delivered in the required manner. However, the research also noted that repeated readings for grades kindergarten and first grade had benefits. Therefore, frequency of vocabulary instruction may be beneficial to students. Varieties of words are encountered more frequently and should be learned earlier (Hiebert, 2011). These high frequency words are necessary for comprehension so fluent reading will occur and will lead to a higher ability to understand the subject matter.
Elfrieda Hiebert (2011) believes four factors impact choices in vocabulary instruction. These four decision making choices are:

1. the frequency of the word
2. the morphology of the word
3. the prior knowledge of the reader
4. the necessity to learn a word due to curriculum

When deciding if a text is the correct match for a student, the above four factors must be taken into consideration along with the need to have or be taught phonemic awareness, phonological knowledge, high frequency and irregular sight words, vocabulary, and the amount of interest in learning. Learning these skills can only benefit readers, especially those who struggle (Gallas & Smagorinsky, 2002).

It is also important to ensure the readers are matched appropriately to the text. In another fluency study, Donovan, Smolkin, and Lomax (2000) completed research revealing recreational reading selections made by students in two first-grade classrooms. One teacher taught both classes, but the composition of students was varied in the two consecutive years in which the research took place. This research demonstrated the choices students make when given a wide range of book levels and genres and how these choices match the students’ reading levels. Over the course of six weeks, the researchers utilized the 30-minute reading periods in the classroom to gather data regarding the book selection each student made. The research showed that low-ability students selected books at a higher level 77% of the time, average-ability students selected books at a
higher level 61% of the time, and gender played a role in the selection of books by high-
ability readers. The high-ability readers still chose books above their reading level, but
the first-year boys chose about 42% more books above reading level while first-
year girls did so only 27.9% of the time. The researchers stated the importance of having
“interesting, high-level-readability books” (p. 330) during recreational reading time
because students “can and do engage meaningfully” (p. 330). Attractive readability
combined with motivation will create the optimum learning environment.

**Computer-based Instruction**

The use of computers in our classrooms is more prevalent (Hsieh & Dwyer, 2009)
today than ever; therefore, a focus on the best practice for implementation of the usage of
computers is required. Teachers are using Internet sites and downloadable programs to
supplement language arts curriculum and learning within the classroom. Some would
argue that the increased availability of online programs is a useful and motivating tool.
However, these notions of computer-based literacy learning are young and researched
little (Karchmer, 2001).

The explosion and availability of technology to more and diverse populations has
created a need for quality computer-based literacy programs (Hillman & Moore, 2005).
Computers have become a necessary tool for student usage because of the dependence on
technology within our global society. Yet, our schools and the design they follow were
created before Internet technology became widespread and hard copies of books were
the norm (Kolikant, 2009). Teachers and students desire the use of computer-based
programs for visual stimulation and monitoring, as well as for audio representation (Hsieh & Dwyer, 2009). The collection of student data from the computer-based programs is also relevant and necessary. Most programs have an internal system tracking and monitoring student achievement, thus allowing easy access to reports.

Teachers must direct students in ways that engage and enhance instruction using the computer-based literacy programs (Malloy & Gambrell, 2006) and utilize the opportunity to increase future student capabilities, either in the workforce or college. Interaction with a computer can have several benefits, such as gains in learning and student gratification (Segers & Verhoeven, 2002). Such learning gains will motivate a student to continue to utilize the computer and enhance his or her learning. The question arises on how the software aligns with the state standards and district benchmarks and if the conception of the programs is actually based upon literacy learning research geared toward authentic contexts (Vogt & Kamil, 1999). Authentic contexts will, in turn, create student motivation for using the computer-based program.

In one study, Segers and Verhoeven (2002) researched kindergarten students in two similar research projects. The first study tracked 25 kindergarten students engaged in three 25-minute sessions in which individual students were pulled into training with the researcher using the computer program. The second study did not provide training but was focused on students’ acquisition of new vocabulary through the use of a computer program. The utilized program was divided into sections: teacher, story/vocabulary, and literacy games. The students listened to the story and were asked questions that would
prompt them regarding correct or incorrect answers. Vocabulary games and discovery games, such as rhyming and color word recognition, were also options for the students after listening at least once to the story. The results showed a clear benefit to using the computer-based program and that more research on the effects of encountering new vocabulary was needed.

In a second study, Mathes, Torgesen, and Allor (2001) focused their research on the use of the Peer-Assisted Learning Strategies program (PALS). The research involved 183 first-grade students. This study examined two distinct groups of data. In the first group, only the PALS program was implemented, while the second group utilized computer-assisted instruction (CAI) to supplement the PALS program. The CAI provided increased instruction without consuming a large amount of instructional time each day. The benefits of the CAI program were colorful graphics and digitized speech that made interacting with the CAI enjoyable for the students. The students in the first group were given their typical daily language instruction as well as the PALS, and group 2 was additionally given the CAI. The research concluded that, although students gained an increase in phonological awareness using the CAI, these results were only short-term. The research also indicated possible reasons for such results, for instance, the implication that direct practice in sounding out words was substantial on its own (Mathes et al., 2001). The CAI may be a useful tool if used to supplement the literacy curriculum and if correct evaluation is done prior to utilization.
A large selection of computer-based software is available for reviewing and reviewing it can be time-consuming to correctly evaluate each program (Coiro, Karchmer Klein, & Walpole, 2006). Due to the overwhelming process of working through a program, it is important to understand it is the teacher’s job to continually work with the students while using the program (Labbo & Kuhn, 2000). Teachers must also continue to evaluate and ensure the usage of the computer program is proper and that alignment with curriculum is occurring (Labbo & Kuhn, 2000). It is ultimately teacher support and intervention within computer-based literacy learning that will ensure students’ learning to read with both print and electronic texts (Matthew, 1997).

A study examining another computer-based literacy program was done by Rodriguez et al. (2012) who were interested in the use of computers to improve comprehension skills in first-grade English Language Learners (ELL). The exploratory study examined the literacy program Lexia Learning because of its capabilities to give directions in English and in Spanish. The study selected 28 ELL identified students, who were then assigned to one of three instructional groups that met during a center time. Even though the sample was low, findings indicated that students given the computer-based program instructions in their primary language had increased comprehension. The study also found the importance of consistent implementation of any computer-based program purchased for a school. The long-term effects of the research were inconclusive, and the small sample size did not provide sufficient data necessary for a definite conclusion (Rodriguez et al., 2012).
The research that has been done thus far shows us that, if used appropriately, computer-based learning can increase literacy skills (Hillman & Moore, 2005). Quality resources used in classrooms, such as computer-based programs, can help immensely with a student’s understanding of new concepts and are important for ensuring students achieve the required first-grade standards (CDE, 2007). The research also shows more studies need to be done to examine the use of computer-based literacy programs with primary-grade students.

**Motivation**

Motivation is an important factor in a student’s success. In fact, motivation is mentioned in the California State Standards and is considered an enhancement to the language arts learning process (CDE, 2007). Motivation has also been shown to engage students in learning, therefore increasing their success in reading (Logan et al., 2011). Teachers who provide ample time for independent reading with interesting materials and demonstrate their own desires to read promote and create intrinsically motivated and successful reading environments. Classroom teachers have established purpose within the realm of recreational reading; this purpose requires teachers to ensure all students are motivated readers (Capen, 2010). The ability to enable students to read demands a differentiated approach with variety and purpose.

A literacy-rich environment that includes appropriate reading materials, allows for a variety of book choices, and sets reasonable yet high expectations for students will increase and nurture the personal desire to read (Morrow, 2004). A large library is a
necessary component in creating this literacy rich and enticing space (Capen, 2010). A classroom with a large selection of books and a variety of titles allows students the opportunity to choose books to which they can relate and those they want to read. Based on the results of the reviewed literature, it seems the availability of computer-based literacy programs provide additional text variety and will increase intrinsic motivation.

Printed texts and virtual texts have the power to motivate (Gambrell, 2006), intrinsically and extrinsically. When students are given choices in selecting reading material, either virtual or printed, rather than having selections chosen for them (Pachtman & Wilson, 2006), they are given an empowering moment that will enhance reading time. It is important the material also be at a level just comfortable enough to encourage students in feeling successful (Pressley, 2006). This type of motivation is the key to getting students not only to become successful at reading but also to keep them reading (CDE, 2007). It is vital to have both intrinsically and extrinsically motivated readers.

Intrinsic motivation is also known as the internal motivation (Logan et al., 2011). This type of motivation encompasses the personal desire to learn, do, and be fully involved, while giving the reader the desire to spend more time working on text. Recreational reading in the classroom promotes this type of motivation through exploration of genres and gives students an opportunity to learn about reading for enjoyment. Intrinsic motivation will eventually lead to a greater understanding of the subject at hand (Logan et al., 2011).
Extrinsic Motivation is also known as the external motivation (Logan et al., 2011). It is the part of motivation affected by the acts of others, such as giving rewards for completing a task. Students will work toward goals through personal excitement about acquiring a star on a chart or another type of end reward and not about the learning taking place. This process can often move students through learning, but they may miss the main learning context and not have a deeper understanding of the work (Logan et al., 2011).

In a study by Mata (2011), 451 kindergarten children participated in research aimed at “characterizing the literacy motivations” (p. 272). The researcher took into account the students’ literacy self-concept, enjoyment, and personal value of literacy. Mata (2011) found that the value of literacy seemed to be the strongest motivation for these students. Mata (2011) stated:

It is necessary to value reading and writing, to want to explore different literacy situations, and to use them in a meaningful way. In order to value writing and reading it is essential that one must have reasons to use and to feel the importance and necessity of written language. The place of literacy in the social structure of families and classrooms may influence the value that children attribute to reading and writing, and therefore their own literacy motivation. (Mata, 2011, p. 288)

Conclusion

The literature review covered the four main areas of context for this study: reading fluency development, readability of reading practice materials, computer-based
instruction, and motivation. Upon examining the literature supporting the thesis, we find that while several studies have already been done regarding the benefits of computer-based literacy learning in the classroom, there is a need for more research as to the quality of these benefits. With reading fluency being the ultimate goal in learning to read, computer-based programs add additional opportunities for students to practice their audio, visual, and oral reading to increase prosody, thereby increasing fluency and possibly comprehension. Beyond the need for computer-based learning, students must, in any case, have exposure to level appropriate materials that challenge them so they continue growing. Finally, the importance and role of motivation cannot be overlooked. Research shows that while extrinsic motivation may get a desired result right away, real learning occurs when the individual works from a place of intrinsic motivation. The literature review further emphasizes the need for the research completed through this thesis. The next chapter discusses the methodology used for the thesis research. The design, participants, measures, instruments, procedures, and information about the researcher are included.
Chapter 3

METHODOLOGY

Overview

To investigate the growing trend of using technology to enhance student learning in the primary grades, this study set out to examine the effectiveness and intended use of two computer-based reading practice programs. The researcher used the guiding question to direct the study and three additional questions aimed to elucidate the data collected: a) Are students motivated to use computer-based literacy programs?, b) How are the assessment data used by the teachers to monitor student growth?, and (c) How appropriately are students placed within each program? Additionally, three first-grade teachers were surveyed for overall satisfaction when using computer-based literacy programs. Chapter 3 describes the design, participants, measures, and procedures used for the study.

Design

The methodology used was primarily descriptive in nature, using both qualitative and quantitative data. The quantitative data included district trimester benchmark assessments in reading fluency, accuracy, and comprehension. The two computer-based programs, Raz-kids.com and Accelerated Reader, also had placement data collected. The qualitative data involved surveys and interviews given to the three first-grade teachers involved in this research. The researcher chose this particular site and classroom because of the variety of roles the researcher already had in place. The researcher was a substitute
teacher, had a first-grade student in the classroom where student generated data were obtained, and already had positive relationships with the three teachers.

The three first-grade teachers were given a double-sided survey asking about the implementation of the two computer-based programs in their classrooms. Specifically, they were asked about ease of implementation, program training, student placement, motivation, and teacher confidence with use of both computer-based programs (see Appendix A). Teacher surveys and follow-up interviews provided qualitative data on the nature and adequacy of placement, how assessment data were collected and used to monitor student growth, and how students were motivated.

The benchmark assessments were consistent across the district and were given at the end of each of the three trimesters. The data consisted of oral reading rate, accuracy, and comprehension. Students were given a timed reading passage and immediately asked questions pertaining to content. The scores were recorded and used for report cards and formal assessment of student growth over the school year. The benchmark assessment data were also used to evaluate student placement within the computer-based assessment programs. The data were examined to see if any growth was evident since the use of these programs began.

The data collected were part of the regular curriculum and were completely anonymous. The teachers, students, parents, school, and district were kept anonymous. Formal permission was obtained from the principal, the three first-grade teachers, and the parents of the students. The study assumed the findings might be applicable to other
first-grade classrooms with similar teacher/student demographics and instructional practices.

**Participants**

The first-grade participants attended a higher income school located in a suburb of a city in Northern California. The school’s population of approximately 700 students had over 400 parent volunteers. The volunteers worked in the classrooms, spending time assisting with fundraisers, field trips, and school functions. This high rate of parent participation enhanced student learning by providing more opportunities for small group instruction. The school was newer and boasted technology and facilities that were relevant and helpful within the educational environment. Each classroom contained one to two computers, television with DVD/VCR, document readers called ELMOs, and some classrooms had a Promethean or smart board.

The school was laid out in a pod formation. Each grade level had its own building and each classroom was connected to a central and common room containing supplies, storage, and additional table space for prepping or working in small groups with students. Teachers also used this space to do their assessments and testing. The quiet and centrally located pod was also a great resource for teachers to share their ideas and plans. It was a place used by the teachers for collaboration, planning, and preparing for shared units.

All the first-grade teachers were fully credentialed and had over 20 years of experience each. A multitude of support staff assisted the teachers in their learning
environment. The speech pathologists, behavioral specialist, library and computer
technicians, occupational therapists, aides, psychologist, nurse, and administrative staff
all spent great amounts of time consulting and assisting as needed to ensure students
received excellent educations. Teachers used Houghton Mifflin California Edition
(www.eduplace.com) for their language arts lessons. The anthologies, practice books,
support materials, and teacher editions were available and current. The most recent
edition was given out in the 2009-2010 school year.

First-grade students were split into early bird and late bird groups by schedule
determined by reading levels. Early birds attended school from 8:25 AM to 1:52 PM.
Late birds attended school from 9:10 AM to 2:37 PM. The split in the class allowed the
teachers to work in smaller groups at a more specific language arts level suitable for the
participating students. The teachers worked on literacy development with only the early
bird students for the 45 minutes in the morning and then used the 45 minutes in the
afternoon with only the late bird students.

Once a week, students visited the library where they were allowed to check out
one book to take home and read. Students chose books according to Accelerated Reading
levels for which they tested. The teachers checked the students’ Accelerated Reading
levels prior to going to the library and ensured each student was aware of his or her
individual level. Students were required to check with their teachers to have their
selections approved prior to checking out. The majority of the books located in the
library had been leveled according to Accelerated Reader and labeled with a color-coded
sticker. The stickers allowed students to quickly and easily identify the correctly leveled book.

First-grade students visited the computer lab once a week for 30 minutes. In the computer lab, teachers enhanced the learning experience of each student by bringing in computer-based programs to assist in learning. Students visited a variety of approved websites, including Accelerated Reader and Raz-kids.com. The Computer Technician had the computers ready when the students arrived. Students each had headphones they used in order to focus on their individual programs without disturbing others.

**Measures**

The researcher utilized five different instruments of measure: Raz-kids.com data for each student, Accelerated Reader data for each student, initial teacher surveys, follow-up interviews, and District Benchmark scores from three trimesters. All data collected were anonymous and intended to answer the guiding question. The three teachers, administrator, and the parents of each of the 16 students who provided data were given consent to participate release forms they signed and returned prior to starting the research.

The data were collected from two distinct groups of participants. The first group consisted of three first-grade teachers. This group provided information on assessment, reading level placement, and the monitoring of student growth. To achieve this, the researcher used two different measures. The three first-grade teachers were given a survey (see Appendix A) that included questions pertaining to the Raz-kids.com and
Accelerated Reader computer-based programs. The surveys contained questions asking about overall impression, placement, and motivation for each individual program. Once the surveys were examined, the teachers were then asked additional questions (see Appendix B) in short interviews. The intentions of the short interviews were to clarify and follow-up on the surveys and data gathered. The second group of participants consisted of 16 first-grade students who shared the same classroom, whose teacher is noted as teacher 1 in the research, and was aimed at investigating the adequacy of student placement. The students were given access to the Razkids.com program at home and at school and to the Accelerated Reader program at school only. They were allowed to use the computer in their classroom and in the computer lab to take tests as needed.

Teacher 1 led the researcher through the two computer-based literacy programs data collection process. The researcher was able to gather the essential information, including placement data, needed for this study from both Razkids.com and Accelerated Reader. Teacher 1 also provided the trimester benchmark scores for accuracy, rate, and comprehension from all three trimesters. The trimester benchmark scores were collected by the teacher during one-on-one assessments. Students were asked to read a passage aloud and then answer comprehension questions immediately upon finishing. The teacher timed the reading of the passage to obtain the CWPM. The decoding errors were noted and used to obtain the accuracy. This information created a glimpse of the students’ fluency, accuracy, comprehension, and an analysis of their progress over time.
Procedures

Data Collection

Initially, the researcher made contact with the site administrator and the three first-grade teachers. There was a discussion about how the research would be conducted and what the necessary measures would entail. The three first-grade teachers and the site administrator signed the consent to participate form, and the one classroom of students, chosen because the researcher’s child was in the class, was given consent forms to be signed by the parents. Copies of the signed forms were given to all participants and the researcher kept the originals.

Once the initial permission was given and the consent forms had been signed, the researcher gave the survey to the three first-grade teachers. The surveys were double-sided and took about 10 minutes to complete. Once finished, the researcher reviewed the surveys and looked for any responses that needed clarification, used in the follow-up interviews later.

The researcher also worked with the one teacher from the selected first-grade classroom to gather data. The information collected by the researcher specifically included: Accelerated Reader progress from the beginning of the school year in August 2010, Raz-kids.com progress since January 2011, and District Benchmark scores from each of the three trimesters in the 2010/2011 school year. The two computer-based programs were password safe and the researcher needed to have the teacher present to
gain access to this material. The District Benchmark assessments also needed to be gathered with the teacher present.

**Data Analysis**

Interpretation of all data collected was a two-year process and required three visits to the school. Once all data had been collected, the researcher reviewed all materials and found questions from the survey needing further clarification. After organizing and analyzing the information, the researcher created the follow-up interview for the three first-grade teachers, which was no more than 15 minutes in length and was utilized as a tool to gather additional information. The follow-up interview was given to the teachers two years after the initial survey had been taken and the teachers had time to alter their views on the programs and how they use them. However, the additional information did enhance the data obtained by the researcher from the initial survey.

The interview was used to clarify the specific data and tools used by the teachers, motivational techniques used for each program in the classrooms, and to illustrate the process in which the data were used to appropriately place students in reading levels. This data was both quantitative and qualitative and was entered into a spreadsheet for a more accurate and accessible view. The researcher was able to see all three responses and make determinations as needed for the research. The benchmark assessment data, Raz-kids.com, and AR assessment data collected were quantitative data and were entered into a database after the research had determined which data would answer the research
questions. The researcher was then able to clearly determine the best possible way to assimilate the data and present the findings.

**Role of the Researcher**

The researcher fulfilled a variety of roles at this school site. The researcher was a substitute teacher, parent of one of the subjects, and a classroom volunteer. The variety of roles provided the participants with a measure of comfort and provided the researcher with greater access to the site. To remain objective, the researcher did not discuss findings or other information regarding the study when visiting the campus for other reasons. This allowed time to organize, analyze, and synthesize data collected through a clearer perspective.

**Conclusion**

Chapter 3 discussed the methodologies used in this research. The use of the five distinct and different instruments of measure was explained, and a clear picture was created regarding the participants. Chapter 4 discusses the actual findings from this study.
Chapter 4

RESULTS

Introduction and Organization

Chapter 3 discussed the methodology utilized for the research. Research design, participants, measures, instruments, procedures, and information about the researcher were revealed. In this chapter, research findings, consisting of both qualitative and quantitative data, are organized into three areas. The data are presented based upon the three research questions: a) How are students motivated to use computer-based literacy programs?, b) How are the assessment data used by the teachers to monitor student growth?, and c) How appropriately are students placed within each program? The data also include a synopsis of overall teacher satisfaction with the two computer-based programs, Raz-Kids.com and Accelerated Reader.

Teacher- and Student-generated Data

The qualitative data were gathered through teacher surveys and interviews submitted by Teacher 1, Teacher 2, and Teacher 3. The teacher surveys and interviews revealed findings for both Raz-Kids.com and Accelerated Reader and were aimed at answering the questions: a) How are students motivated to use computer-based literacy programs?, b) How are the assessment data used by the teachers to monitor student growth?, and c) What is the overall satisfaction when using computer-based literacy programs?
Three first-grade teachers were given the initial survey (see Appendix A) to determine placement, motivation, and overall impression of each computer-based programs, Raz-Kids.com and Accelerated Reader. The initial survey was given at the end of the school year, and the follow-up interview was given almost two years later in the early spring. The surveys were double-sided and allowed the teachers to rate each area and complete a written response if needed. Teachers were given the surveys and asked to return them to the researcher once completed. Once the surveys had been collected, the researcher was able to determine if further information was needed and created the follow-up interview. The follow-up interview (see Appendix B) was double-sided and allowed for a more complete written response. The researcher determined additional information was needed for both programs regarding the data actually utilized, how accuracy and fluency were determined, the importance of motivation, tools used to create motivation, and why some students were not motivated. All three teachers were given this form a year and a half after the initial survey. Once all material had been collected, the researcher was able to analyze the data.

The quantitative data were generated by the students and gathered from their teacher, Teacher 1, through the use of teacher-generated assessment or computer-based assessment. Student trimester benchmark assessment scores, Raz-Kids.com assessment scores, and Accelerated Reader assessment scores were given to the researcher and any acronyms or information unclear in the reports were explained by Teacher 1. The data were collected all at once at the end of the school year. Teacher 1 had recorded the three
trimester benchmark scores for the year and gave a copy to the researcher. The AR and Raz-Kids.com scores were collected at one sitting and reflected the students’ progress up to that point at the end of the school year.

**Accelerated Reader**

Accelerated Reader, a computer-based reading program produced by Renaissance Learning, uses a balance of teacher-guided book selection followed by independent student reading (Magnolia Consulting, 2010) and is purchased by the school as a supplement to the language arts curriculum. The three first-grade teachers surveyed used this program as part of their supplemental language arts curriculum. Once students finished reading their selected books, they were given short online timed quizzes to test for comprehension. The results of these quizzes were recorded, and qualitative data, in the form of comprehension scores, book levels, and points earned, were organized for the teachers’ use to guide further book selection. This program utilized a balance of computer-based learning and materials found in the classroom. Accelerated Reader placed technology in the hands of the students and was a step in preparing them for a future in a computer-laden society (Erdner et al., 1998). Students participating in the program exhibited learning gains in their instructional reading levels (Magnolia Consulting, 2010).

**Raz-Kids.com**

Raz-Kids.com, a product of LearningA-Z.com, is a computer-based program purchased by the school and utilized as a supplement to the language arts curriculum in
the primary grade classrooms at the research site. The three first-grade teachers use this program as part of their supplemental language arts curriculum. Raz-Kids.com, developed by LearningA-Z.com, uses online books, allowing students to choose to listen to books read aloud by the computer program, to read a book independently, or to take the short comprehension quiz associated with the selected book (Klein, 2008). Students earn points to build a rocket and move up to the next level of reading selections upon successful completion of the current level. LearningA-Z.com notes that Raz-Kids.com uses modeled fluent reading and differentiated instruction to assist students in learning to read (Klein, 2008).

**Are Students Motivated to Use Computer-based Literacy Programs?**

Student motivation when using the computer-based literacy programs appeared to be extrinsic in nature. The three teachers were asked about observed motivation in their classrooms when using Accelerated Reader and Raz-Kids.com. The teacher participants formulated an approximate percentage of student motivation based on what they believed was occurring.

Student motivation when participating in the AR program was reported by each teacher. Teacher 1 and Teacher 2 believed that 100% of their students were motivated by the AR program while Teacher 3 had 70% of the students motivated. Teachers indicated goal-setting, reading logs, star charts, and class parties were all ways they motivated students to use the program. It was noted students liked getting 100% on their tests.
Extrinsic motivation was indicated by Teacher 2 at 100% because students wanted to see the grade level they could choose books from. Teacher 2 also used parties, star charts, and other material rewards to extrinsically motivate the students. Teacher 3 reported an 80% extrinsic motivation in the classroom and used parent partnership and immediate feedback and instruction to increase motivation. An indication of 0% was noted by Teacher 1 but she also mentioned the program produced scores the students liked receiving and encouraged parents to monitor reading at home.

Intrinsic motivation was indicated as an internal push to increase the reading level of the students and that the motivation was not due to an enjoyment of the stories. Teacher 1 reported 0% internal motivation and noted that this is the case due to maturity and attention span, important factors in motivation. Teacher 2 reported 100% intrinsic motivation but noted enjoyment of the stories came second to seeing their comprehension scores and reading levels change after each book selection. Teacher 3 had 80% intrinsic motivation using the AR program. Teacher 3 also noted it is important to keep children reading at instructional levels that challenge their reading skills.
Figure 1. Accelerated Reader motivation.

Teachers 1 and 2 indicated 100% of their students were motivated when participating in the Raz-Kids.com program. Teacher 1 noted the rocket was the prime motivation for student involvement. Teacher 3 indicated only 80% of the students were motivated to use this program. Teacher 3 noted some students do not get adequate parent support or encouragement at home and so did not use the program enough. Teacher 3 also believed some students were discouraged by failure to connect well with the computer model. Inappropriate placement and some story content also played a role in lack of motivation. Teacher 1 and Teacher 2 indicated 100% of the students were extrinsically motivated to participate. The key factors providing motivation were the stars collected, the rocket ship that could be built, and the ability to earn points, leading to completion of each level. Teacher 3 indicated only 60% extrinsic motivation because
parent involvement and encouragement were necessary for use at home. Teacher 3 noted intrinsic motivation is important to keep students returning. Teacher 3 also noted only 40% of the students were intrinsically motivated. Teacher 2 noted 100% intrinsic motivation while Teacher 1 had 0%. Teacher 1 noted the motivational factors within the program were extrinsic.

![Bar chart showing motivation percentages](image)

*numbers are in percentages

**Figure 2. Raz-Kids.com motivation.**

The researcher was able to determine that teachers acknowledge the students’ desire for star rewards, higher reading level, and classroom treats. The intention for student reading, even when noted as intrinsic in nature, was aimed at the external rewards. It was determined that both programs’ motivational factors were primarily extrinsic. The intrinsic motivation was characterized as an internal push to increase reading levels; however, reading levels are an extrinsic reward. Intrinsic factors were
determined to include maturity, attention span, and an instructional reading level appropriate for increased challenge.

**How Are the Assessment Data Used by the Teachers to Monitor Student Growth?**

The teachers in this study used a variety of informal and formal assessment tools to monitor growth, correctly gauge the reading abilities of each student, and form data-driven decisions to enhance and reinforce learning accomplished in the classrooms. Along with the curriculum assessments and visual monitoring of maturity and attention span, the teachers used the trimester benchmark assessments, Accelerated Reader, and Raz-Kids.com to complement the data. The use of the trimester benchmark assessments allowed a glimpse at the accuracy, WPM, and comprehension progress made by each student throughout the school year. The Accelerated Reader program and Raz-Kids.com were not used in isolation in the three classrooms but as supplemental literacy tools to enhance students’ reading comprehension and motivation. The teachers did not utilize all aspects of the two programs, such as the vocabulary tests or literacy skills quizzes and placement tests, but focused on the reading quizzes and the comprehension scores obtained. Teachers said accuracy and fluency scores were not part of the programs they used. All teachers utilized the reports section of both computer-based programs to gain access to diagnostic, progress, and goal related reports.

In the AR program, the reports section provided information about book level, quizzes passed, grade-level equivalent, percentage of questions correctly answered, and other data useful for teacher assessment and as information for parents. Teacher 3
indicated the book levels were checked weekly to ensure students were given appropriate reading books. In Raz-Kids.com, the reports section provided information about reading level, length of time visiting the site, books read, quizzes passed, missed skills on each quiz, duration of time on each reading level, and whether a student listened to the story.

Accelerated Reader utilizes the ATOS Readability formula for books. ATOS is an acronym for Advantage/TASA Open Standard (Renaissance Learning, 2013). The ATOS system is an extensively researched source for calculating readability (Milone, 2012) and is correlated with a variety of other reading leveling systems such as the Developmental Reading Assessment or DRA (www.pearsonschool.com), Reading Recovery(www.readingrecovery.org), and Fountas & Pinnell’s Guided Reading leveling system (www.fountasandpinnellleveledbooks.com). The program also keeps extensive records on the books read and quizzes each student uses. Information on amount of fiction and nonfiction books read and percentage of correct answers on quizzes is kept as well.

For this study, Teacher 1 printed up the Student Record Report for the researcher. This report had a list of dates quizzes were taken, quiz titles with quiz number, number of questions correctly answered, points earned, and ATOS book level score. This report, shown in Table 1, is a clear picture of all student interactions with the AR program.

The researcher determined this program was best examined through the lens of comprehension and motivation due to teacher surveys of how the program was utilized in the classroom. The AR program does not obtain fluency and accuracy scores.
### Table 1

**Accelerated Reader Student Results**

<table>
<thead>
<tr>
<th>Student</th>
<th>Quizzes Passed</th>
<th>Quizzes Taken</th>
<th>% Qs Correct</th>
<th>% Fiction</th>
<th>Book Level</th>
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<tbody>
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<td>30</td>
<td>89.3</td>
<td>90</td>
<td>3.2</td>
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<td>26</td>
<td>87.7</td>
<td>95</td>
<td>2.1</td>
</tr>
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<td>90</td>
<td>3.1</td>
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Teacher 1 used the data provided by Raz-Kids.com to determine how often students were using the program. Teacher 1 was also able to see the motivation students had to use Raz-Kids.com through star collection, rocket building, and the pace of movement through each level. Teacher 3 monitored the amount of time students accessed the program and whether they were progressing through the levels at an appropriate pace. Teacher 3 could also determine whether this alternative form of reading practice was being utilized at home to encourage additional reading practice beyond school and if the pace of movement was a result of this additional time.

The program uses qualitative and quantitative data when leveling their books. Raz-Kids.com uses a letter system to represent each book level. This book level correlates to other familiar leveling systems such as DRA, Lexile, and Reading Recovery. The criteria also consider the reader and the reading task. This triad of information creates a complete picture of the book and is correlated to the Common Core Standards (Learning A-Z, n.d.).

The data collected from the teacher regarding the 16 students are shown in Table 2. These data can be used to examine the comprehension and motivation of each student. They show how often students had used the program, how well they performed on the quizzes, and the levels they were reading at.
Table 2

*Raz-Kids.com Student Results*

<table>
<thead>
<tr>
<th>Student</th>
<th>Quizzes Passed</th>
<th>Quizzes Taken</th>
<th>% Qs Correct</th>
<th>Level</th>
<th>Grade</th>
<th>DRA</th>
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<td>6</td>
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<td>238</td>
<td>76.74</td>
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<td>18</td>
</tr>
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<td>6</td>
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<td>95</td>
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<td>N</td>
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<td>28</td>
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<td>7</td>
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<td>H</td>
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<td>14</td>
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<td>8</td>
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<td>76</td>
<td>87.63</td>
<td>D</td>
<td>1</td>
<td>6</td>
</tr>
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<td>9</td>
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<td>25</td>
<td>89.6</td>
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<tr>
<td>10</td>
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<td>273</td>
<td>86.94</td>
<td>K</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>11</td>
<td>166</td>
<td>185</td>
<td>90.7</td>
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<td>2</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>167</td>
<td>176</td>
<td>91.34</td>
<td>N</td>
<td>2</td>
<td>28</td>
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<tr>
<td>13</td>
<td>59</td>
<td>60</td>
<td>97</td>
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<td>14</td>
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<td>46</td>
<td>86.5</td>
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<tr>
<td>16</td>
<td>323</td>
<td>381</td>
<td>88</td>
<td>M</td>
<td>2</td>
<td>24</td>
</tr>
</tbody>
</table>
The Benchmark Assessments were gathered from Teacher 1. These data came from 16 students and contained the words per minute (WPM) and accuracy (ACC) score for each of the three trimester report card periods. The reading passages for each trimester were grade level appropriate and different for each trimester reporting period. The reading passages were determined appropriate by the lead language arts teachers and the district office. Students were given a new reading passage and asked to read it out loud to the teacher. The teacher would time the length of reading, make notes on any reading errors, and record the data. The passages also contained reading comprehension questions that could be asked of the students immediately following the reading. Teacher 1 did not use these questions and so did not have comprehension data to be collected.

Table 3

*Benchmark Assessment Student Results*

<table>
<thead>
<tr>
<th>Student</th>
<th>1st WPM</th>
<th>1st ACC</th>
<th>2nd WPM</th>
<th>2nd ACC</th>
<th>3rd WPM</th>
<th>3rd ACC</th>
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<tr>
<td>1</td>
<td>141</td>
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<td>128</td>
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<td>3</td>
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<td>76</td>
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<td>141</td>
<td>100</td>
<td>131</td>
<td>100</td>
<td>118</td>
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</table>
Table 3 (continued)

<table>
<thead>
<tr>
<th>Student</th>
<th>WPM 1st</th>
<th>ACC 1st</th>
<th>WPM 2nd</th>
<th>ACC 2nd</th>
<th>WPM 3rd</th>
<th>ACC 3rd</th>
</tr>
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<tbody>
<tr>
<td>7</td>
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<td>51</td>
<td>90</td>
<td>72</td>
<td>94</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>95</td>
<td>50</td>
<td>95</td>
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<td>10</td>
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<tr>
<td>11</td>
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<td>131</td>
<td>100</td>
<td>121</td>
<td>96</td>
<td>127</td>
<td>100</td>
</tr>
<tr>
<td>13</td>
<td>146</td>
<td>100</td>
<td>143</td>
<td>100</td>
<td>138</td>
<td>100</td>
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<td>16</td>
<td>51</td>
<td>97</td>
<td>83</td>
<td>96</td>
<td>100</td>
<td>98</td>
</tr>
</tbody>
</table>

The data obtained by the researcher indicated all three assessments provided data used by the teachers to guide instruction. AR and Raz-Kids.com had comprehension scores that could be used to monitor students’ growth and their reading levels. This comprehension data could also be used to determine whether the students were appropriately placed in their levels, if they were in need of additional instruction, or if they were utilizing the programs enough to benefit. It would be beneficial if the trimester
benchmark assessments also had comprehension scores. This would allow teachers to determine whether students are reading at the appropriate first-grade level determined by the district and then could be used to compare to the comprehension scores of the supplemental computer-based programs to further enhance the data.

The researcher determined the comprehension scores from AR and Raz-Kids.com could be compared to determine whether students were being appropriately placed. Students receiving consistent comprehension scores between the two programs were being challenged at a consistent level. If there was too much of a discrepancy then the teachers needed to consider reevaluating the level. Also, if the students were scoring below a certain percentage, as determined by the teacher, then reevaluation would be deemed necessary. The benchmark assessments could also be used to further validate the appropriateness. Teachers could choose to use the WPM, Accuracy, and comprehension scores to further assess the leveling and growth of students over time.

Of the 16 students’ comprehension scores, it was noted 13 students had similar comprehension scores in both programs. The three students who had a significant difference in comprehension between the two programs had data-driven results demonstrating they were at a frustrated level for the benchmark assessments. It should be noted when giving the quizzes, oral reading passages, and time to work on reading of the text, that students can have an “off” day or be distracted by environment or peers. Furthermore, student #5 had comprehension scores at 78.5% for AR and 76.74% for Raz-Kids.com. This student showed a drop in Accuracy and WPM in the final benchmark
assessment. In this circumstance, the teacher needed to adjust the reading levels in both programs and determine what the decrease on the Benchmark was due to.

The use of the benchmark assessment, tests and quizzes in the classroom, daily student work, and the data collected through the use of computer-based literacy programs enhanced the learning process and produced valid and reliable sources of data that can guide teachers in the classroom. The teachers in this study used the data to inform parents of progress. This home-school connection also enriched learning. Parent knowledge of student progress helped prevent surprises and allowed teachers to support the growth of each student.

**How Appropriately Are Students Placed in Each Program?**

The three teachers were asked how appropriately the students were placed within the Accelerated Reader program. Teacher 1 placed the students within the AR system according to classroom observations made. Teachers 2 and 3 thought the placement process was excellent; Teacher 2 wrote the records reports were an excellent source for indicating reading level. Teacher 3 indicated the program was above-standard. Teacher 2 indicated it was easy to set parameters and to see progress. All three teachers seemed to believe the match of reading level and materials to student ability was good. The three teachers indicated wide ranges of reading difficulty within each level and that they were also able to monitor the material the students were reading and determine if appropriate.
Table 4

**Accelerated Reader Placement**

<table>
<thead>
<tr>
<th></th>
<th>Not Sure</th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Adequate</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of Students</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Meets Benchmark Assessments</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tracking of Student Growth</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matching of Reading Levels and Materials</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Numbers represent the number of teachers who selected the particular choice.

The placement process for Raz-Kids.com was unclear for the three teachers. The teachers placed their students in reading levels based on formal and informal assessments given in class. Students then worked through the levels by completing the reading, listening, and quiz tasks associated with each book. Teacher 2 noted there was no clear
process to determine student level placement using the leveling chart on the website.

Teacher 1 was unaware of any placement component. The teachers had differing views on how the program coincided with benchmark assessments. Teacher 2 stated there was a need to figure out how to decipher the data. Teacher 2 noted the program offered data on the frequency with which students access Raz-Kids.com and their progression. These data offered insight into home participation and practice beyond what the students read each week in school.

The three teachers had a wide range of opinions about the tracking of growth. Teacher 1 noted the growth measured was a direct result of student motivation and that this program tracked student usage. Teacher 2 wanted to better understand how to use the data produced through student usage and to allow parents the same benefit.
Table 5

*Raz-Kids.com Placement*

<table>
<thead>
<tr>
<th></th>
<th>Not Sure</th>
<th>Not at all</th>
<th>Somewhat Adequate</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of Students</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Meets Benchmark</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Assessments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tracking of Student</td>
<td></td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Matching of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Levels and</td>
<td></td>
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<tr>
<td>Materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Numbers represent how many teachers selected that particular choice.

The researcher was able to determine the two computer-based programs, Accelerated Reader and Raz-Kids.com, were used differently for student placement.
Teachers used the STAR Achievement Test offered through the AR program to determine appropriate reading level and monitored scores to assure progress. The teachers placed students in Raz-Kids.com based upon their own perception of appropriate reading levels. Based upon these data, teachers need to be trained in the appropriate placement procedures for both programs in order to ensure students gain the most benefits. Furthermore, teachers need to understand how the data could be used to guide instruction. To appropriately guide teachers in analyzing the data, it would be beneficial to provide trainings, staff collaboration, and educational materials.

**Overall Teacher Impressions of the Two Computer-based Programs**

The teachers were asked about ease of implementation, confidence with the Accelerated Reader program, and the effectiveness of the program in promoting student achievement. Teachers 1 and 2 felt ease of implementation was excellent, and Teacher 3 considered it good. Teachers 1 and 2 had excellent confidence in the use of the AR program, while Teacher 3 had a good level of confidence. Finally, the effectiveness of the program in promoting student achievement was considered good by Teacher 3 because most kids enjoyed the program and wanted to improve. Teachers 1 and 2 believed level of effectiveness of the program was excellent. Teacher 1 noted the AR program promotes student achievement, and Teacher 2 noted students wanted to see great test scores and parents could monitor results.
Table 6

*Numbers represent the amount of teachers who selected the particular choice.

<table>
<thead>
<tr>
<th></th>
<th>Not Sure</th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Adequate</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to Implement</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence in use of Program</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective Promotion of Student reading Achievement</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Teachers were not given a formal training session with the Accelerated Reader programming at this school site. There was a teacher available onsite to assist other teachers as needed to troubleshoot, introduce different aspects, or familiarize with the program. The school district also had training resources available for the teachers. Accelerated Reader offered videos and a variety of online resources to better acquaint teachers with the program. Teachers 1 and 3 received some sort of training and felt it had
been helpful. Teacher 2 learned the program through trial and error and felt it had been very easy to understand and use.

*Numbers represent the number of teachers

**Figure 3.** Accelerated Reader teacher training.

The teachers reported their confidence in the use of the Raz-Kids.com program. Teacher 2 wrote the program was very user-friendly. Teacher 1 liked the listening portion of the program because some students were not able to decode and could still use the program. Teachers 2 and 3 noted the promotion of student reading achievement came through the motivational aspects of the program such as collecting stars to purchase rocket-building materials. Teacher 3 also noted the program was helpful in fulfilling the 20-minute reading requirement at home each night.
Table 7

*Raz-Kids.com Overall Impression*

<table>
<thead>
<tr>
<th>Note</th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Adequate</th>
<th>Good</th>
<th>Excellent</th>
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</thead>
<tbody>
<tr>
<td>Easy to Implement</td>
<td>1</td>
<td>2</td>
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<td></td>
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<tr>
<td>Confidence in use of Program</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective Promotion of Student reading Achievement</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Numbers represent the how many teachers selected that particular choice

The teachers using the Raz-Kids.com program did not receive formal training. Other staff members who had used the program previously were able to give them minimal instruction. Teachers then used self-training and trial and error discovery to figure out additional aspects of the program.
Figure 4. Raz-Kids.com teacher training.

The overall teacher impression for the two computer-based literacy programs implemented in the three classrooms appears positive. The teachers indicated more training and assistance provided with the AR program, whereas Raz-Kids.com was highly user-friendly and easy to implement. The teachers also indicated Raz-Kids.com was a program they were still figuring out. Both programs assisted in meeting daily reading requirements and had extrinsically motivating techniques that promoted recreational reading.

Conclusions

The data gathered through the research support the use of computer-based literacy programs as a supplement to the classroom curriculum. Teacher training is highly important and necessary to ensure students are placed appropriately in the programs.

*Numbers represent amount of teachers who responded
Teachers must also ensure they are using all possible modes of formal and informal assessment to accurately and consistently monitor student growth over time. The monitoring and comparing of student assessment scores can guide teachers on the individualized learning needed for each student and can promote an intrinsic desire for recreational reading. The extrinsic rewards will also ensure students continue to push themselves to achieve. This chapter revealed the data acquired through the research. Chapters 5 synthesizes the data and makes future recommendations for research in this content area.
Chapter 5

DISCUSSION

Chapter 4 presented and organized the data based upon the three research questions: a) Are students motivated to use computer-based literacy programs?, b) How are assessment data used by the teachers to monitor student growth?, and c) How appropriately are students placed within each program? A synopsis of overall teacher satisfaction with the two computer-based programs, Raz-Kids.com and Accelerated Reader, was also given. Chapter 5 aims to synthesize data obtained during the research, review limitations and issues that occurred, and discuss future research recommendations.

Significance of Study

Presence in the classroom had created ample opportunity for the researcher to participate in the use of two computer-based programs as supplemental literacy tools. This opportunity had raised multiple questions for the researcher, and the decision was made to study this area and enrich the researcher’s knowledge of the topic. The aim of the thesis was to examine two computer-based literacy programs, Raz-Kids.com and Accelerated Reader, used by three first-grade teachers at a suburban Northern California elementary school. The teachers were surveyed to find out if students were motivated to use the two programs, if the students were adequately placed into independent reading levels within each program, how the student assessment data were analyzed, and overall satisfaction of the two programs. The researcher obtained student reports from one
teacher with quantitative data on 16 first-grade students who used both computer-based literacy programs. The teacher also provided trimester benchmark assessment data.

The researcher retrieved literature meant to reinforce the significance and guide the research. The first article by Hsieh and Dwyer (2009) stated computers were becoming increasingly popular in education, immediately bolstering the need for the researcher to acquire evidence supporting the use of computer-based literacy programs. It has become obvious students are capable of using these programs and should be given the opportunity to develop their literacy while their motivation is promoted. The school site used in this research purchased two computer-based programs meant to supplement literacy learning.

In a study by Hiebert (2005), it was noted features and content make a difference in the fluency with which the text is read by students. This was crucial because the researcher was curious about any research being done on the texts used with accompaniment of the two programs. Ability to decipher and understand appropriately leveled vocabulary was also very important. Beck et al. (2002) noted not all vocabulary will be understood and words that gain comprehension need to be seen multiple times. An examination of book leveling was deemed necessary for both computer-based literacy programs used at the school site.

Motivation was a vital component in the computer-based literacy learning process. The researcher noticed excitement about using the programs from teachers, parents, and students. Students need to be motivated, intrinsically or extrinsically, for
independent reading level achievement. Logan et al. (2011) noted motivation was shown to engage students in learning and increased reading success. Parents and teachers must be able to acknowledge the importance of motivation and utilize it to promote literacy. Opportunities for rewards and recreational reading need to be provided to encourage continued enjoyment.

Finally, the researcher noted a variety of formal student assessment data given to the parents. These data contained reports printed from Accelerated Reader and Raz-Kids.com and the written report from the teacher’s trimester benchmark assessment consisting of WPM, accuracy, and comprehension. These formal assessment data are vitally important and, if utilized correctly, could further inform the teacher about students’ reading abilities and guide literacy instruction. These reports are important for parents as well. Parents are a child’s primary advocate and access to important literacy data is essential to ensuring appropriate educational opportunities are provided throughout the schooling process.

**Issues and Limitations**

Methodological issues arose during the research process. First, it was noticed teachers may have been unclear on the researcher’s use of terminology, specifically when speaking about intrinsic versus extrinsic motivation. It would have benefited the study to ensure each participant was clear on vocabulary used and the intent of the questioning. Second, the gap of time between gathering student-generated data, initial teacher survey, follow-up survey, and the researcher’s writing process, made it difficult to fill in any
holes in the data or clarify questions that may have emerged. It would have benefited the researcher to have ensured all data were gathered in an appropriate timeframe; this would have established the questions to be clarified prior to the school year ending. Third, Teacher 1 started using Accelerated Reader in August and Raz-Kids.com in January. A more exact picture could have been painted if the data obtained had been for the same length of time. Starting the research at the beginning of the school year would have allowed the researcher to promote an earlier starting time for Raz-Kids.com. The researcher would have derived a more accurate picture if the data had been collected for Raz-kids.com, AR, and the trimester benchmark scores simultaneously at each of the three trimesters when the teachers gave the trimester benchmark assessments. Finally, Teacher 1 did not record comprehension scores for the trimester benchmark assessments. These data would have immensely assisted in the cross-data evaluation of student comprehension scores and could have led to a more accurate discovery of reading level placement. Again, if the research had been started at the beginning of the school year, it could have been expressed that comprehension scores were needed.

**Areas for Further Research**

The researcher acknowledges the need for future research. Computer-based literacy programs are easily accessible and can benefit student literacy learning. The potential impact of computers on education is just beginning to be understood. Consideration of best practices for any computer-based program used in the classroom as a supplemental language arts curriculum, is critical. The desiderata of accurate
placement and readability of texts used within the programs necessitate further research. Teachers must know the programs they are using provide content and age-appropriate material ensuring congruous student literacy learning. Furthermore, comparison of reading levels and comprehension scores from classrooms implementing the computer-based literacy programs and those who do not would be a great asset. Forthcoming research will ensure future computer-based literacy programs establish clear and concise goals to promote, enhance, support, and supplement the language arts curriculum across the grade levels.

**Conclusion**

There is need for increased availability of reading materials, including computer-based programs, within the classroom to ensure appropriate reading opportunity is provided students. This availability will ensure student motivation and future success. Parents need to be informed of literacy learning taking place in the classroom and offered ways to support the learning at home. The two computer-based literacy programs studied in this thesis can be used to make the school-to-home connection. Parents can be empowered to support students and teachers while promoting technology and literacy.

The research shows evidence of extrinsic motivation incorporated into the two programs and utilized by the teachers. Teachers must be aware of the importance of extrinsic motivational tools in the early primary grades. First-grade students desire acknowledgment for their accomplishments and enjoy obtaining rewards. Raz-Kids.com encourages the students with stars, rocket building, and points. The program enhances
literacy learning through a variety of both fiction and non-fiction texts that can be read or listened to. Listening allows access for students who are still decoding and will promote more confidence when they answer the comprehension questions in story quizzes. Accelerated Reader provides opportunity for student text choice and promotes intrinsic motivation through recreational reading. Students are additionally motivated extrinsically through quiz scores, points earned, and reading level adjustments that occur after each quiz. This immediate feedback is authentic and promotes desire to select a new book and begin the process again. Both programs, used separately or in conjunction, can provide a positive experience for both teachers and students and can benefit literacy learning.

Data provided in this thesis suggest intrinsic motivation was seen by the teachers; however, no concrete evidence was presented. The researcher is unclear if this was due to a lack of clear understanding of the research terminology or if it was not noted on the surveys. Intrinsic motivation was defined as “dual qualities of enjoyment or interest in performing an activity, such as reading, and the disposition or intention to participate in the activity when it is appropriate” (Guthrie & Wigfield, 2000, p. 407). Furthermore, intrinsic motivation can be manifested through recreational reading and choice of genre that interests the individual. Accelerated Reader enhances this aspect of reading for first-grade students. AR gives the students a range of reading levels with a variety of titles to choose from. Students may pick a book in their reading level. Raz-Kids.com also provides choice of text through the level-specific set of books offered online. The
opportunity to choose a book is enticing for the students and can promote intrinsic motivation to continue recreational reading.

Research evidence also emphasized the importance of teachers using a variety of informal and formal modes of assessment when determining student instructional and independent reading levels. The purpose of assessments is to guide teaching practices and ensure students are reaching full literacy potential. It is necessary to train teachers to use the computer-based literacy programs assessment reports and placement procedures appropriately. Training should occur prior to use, and teachers should be aware of technical support provided for each product. Teachers must be knowledgeable in a variety of curricula; with increased dependency on computers in the world, it naturally follows computer-based literacy programs are now used to supplement the language arts curriculum. These programs must be incorporated into our classrooms to enhance student strengths in technology, provide opportunity for student growth, increase available formal assessment data to guide teacher-led instruction, and to support the Common Core State Standards.
APPENDIX A

Survey

Computer-based Literacy Applications Survey

Please rate the following using the scale provided;
N/A = not sure  0 = Not at all  1 = Somewhat  2 = Adequate  3 = Good  4 = Excellent

Accelerated Reader

Overall Impression
Is this program easy to implement?
N/A  0  1  2  3  4
Comment__________________________________________________________

Did you receive training for this program?
No  Yes
Comment__________________________________________________________

If you received training, was this training adequate for your use?
No  Yes
Comment__________________________________________________________

How confident are you with your use of this program?
N/A  0  1  2  3  4
Comment__________________________________________________________

How effective is the program in promoting student reading achievement?
N/A  0  1  2  3  4
Comment__________________________________________________________

What aspects of reading does the program primarily address (check all that apply)

Accuracy (decoding strategies)  Other
Fluency (reading rate)  Comprehension
Comment__________________________________________________________

Placement
How well does this program place students?
N/A  0  1  2  3  4
Comment__________________________________________________________
How well does this program seem to coincide with your benchmark assessments of student reading?
N/A 0 1 2 3 4
Comment__________________________________________________________

How well does the program track student growth?
N/A 0 1 2 3 4
Comment__________________________________________________________

How accurate and consistent is the match between students' reading levels and the reading materials?
N/A 0 1 2 3 4
Comment__________________________________________________________

Motivation
Approximately what proportion of your students are:
Motivated when participating in this program? _________%
Extrinsically motivated (e.g. by points, stickers, or building the rocket)?__________%
Intrinsically motivated (e.g. for the enjoyment of the stories)? ___________%

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Overall Impression
Is this program easy to implement?
N/A 0 1 2 3 4
Comment__________________________________________________________

Did you receive training for this program?
No Yes
Comment__________________________________________________________

If you received training, was this training adequate for your use?
No Yes
Comment__________________________________________________________

How confident are you with your use of this program?
N/A 0 1 2 3 4
Comment__________________________________________________________

How effective is the program in promoting student reading achievement?
N/A 0 1 2 3 4
Comment__________________________________________________________
What aspects of reading does the program primarily address (check all that apply)

- ______ Accuracy (decoding strategies)
- ______ Other
- ______ Fluency (reading rate)
- ______ Comprehension

Placement
How well does this program place students?
N/A 0 1 2 3 4
Comment

How well does this program seem to coincide with your benchmark assessments of student reading?
N/A 0 1 2 3 4
Comment

How well does the program track student growth?
N/A 0 1 2 3 4
Comment

How accurate and consistent is the match between students' reading levels and the reading materials?
N/A 0 1 2 3 4
Comment

Motivation
Approximately what proportion of your students are:
Motivated when participating in this program? _________%
Extrinsically motivated (e.g. by points, stickers, or building the rocket)? _________%
Intrinsically motivated (e.g. for the enjoyment of the stories)? _________%
APPENDIX B

Follow-up Teacher Interview

Computer-based Literacy Applications Follow-up Interview

Accelerated Reader

1. Which data information do you look at? Why?

2. From using the AR program, how do you obtain accuracy and fluency data?

3. What tools do you utilize for extrinsic motivation?

4. How important is intrinsic motivation? How important is extrinsic motivation?

5. Why are some students not motivated? Is reading ability, content, or inappropriate placement a factor?

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1. Which data information do you look at? Why?
2. From using the Raz-kids program, how do you obtain accuracy and fluency data?

3. What tools do you utilize for extrinsic motivation?

4. How important is intrinsic motivation? How important is extrinsic motivation?

5. Why are some students not motivated? Is reading ability, content, or inappropriate placement a factor?
REFERENCES


