

The Effect of Accelerated Reader® on the
Reading Comprehension of Second Grade Students

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RUNNING HEAD: ACCELERATED READER® AND COMPREHENSION

Abstract

Students must master reading skills earlier and faster than ever before. The No Child Left Behind Act of 2001 tasks educators with teaching children to read at or above grade level by third grade. Instructional methods should be based on scientific research, assist teachers with identification of learning barriers, and provide assessments and accountability. Research shows that computer-assisted instruction increases reading skills and comprehension. This study will examine the effectiveness of the Accelerated Reader® program on the reading comprehension of second grade students. The study will employ the Pretest-Posttest Equivalent-Group Design, including using the independent sample t-test and related sample t-tests. It is predicted that the Accelerated Reader® program will have a positive effect on reading comprehension.

The Effect of Accelerated Reader® on the Reading Comprehension of Second Grade Students

Reading is Fundamental, introduced in 1966 by Margaret McNamara, is a phrase that has permeated the American culture. As a nation it is recognized that all other curricula areas necessitate reading; students who do not master reading skills are commonly unsuccessful in their school endeavors. In order to succeed in school or life, one must be able to read (Feldman, 2002). Teachers are asked to select the correct approach or approaches to successfully teach students to read. Research shows that the teaching of reading is multifaceted and that a combined approach, including all reading components, is most successful (Moats, 1999). Although computer-assisted learning is a growing strategy for reading instruction, technology is expensive for schools to adopt, so administrators must determine whether this strategy for instruction is a valid expenditure of the school's resources.

This research proposal suggests that reading comprehension can be positively influenced by computer-assisted instruction, specifically through the use of the Accelerated Reader® program. The Accelerated Reader® program consisting of a software program and related materials is expensive, so it should be studied in order to ensure a wise expenditure of instructional funds. The hypothesis of this study is that Accelerated Reader® has a positive effect on the reading comprehension skills of second grade students. The null hypothesis is that Accelerated Reader® has no effect on the reading comprehension of second grade students.

The Significance of the Problem

Educators struggle with the need to provide the best education for students while prudently spending allocated resources for curriculum implementation. Students are expected to

master reading skills at earlier ages than ever before. The No Child Left Behind Act of 2001 puts reading skill acquisition at the forefront of education reform. Teachers are expected to use the best methods available to teach children to read (Bush, 2001). Researchers are beginning to identify that reading instruction should be a multifaceted approach to ensure all students receive instruction in a way that makes learning meaningful (Moats, 1999). If this approach is the most beneficial to the student, then educators must carefully choose the most appropriate materials to get the job done. Computer-assisted instruction, since it supports an individualized learning approach, may prove to be an effective method of contributing to this multifaceted approach. However, it is an expensive investment and one that needs to be researched before adoption.

Assumptions

In this study of the effect of Accelerated Reader® on reading comprehension for second graders, the following assumptions have been made:

1. Students have successfully completed kindergarten and first grade, as evidenced by a review of report cards and student files;
2. The school has appropriate technical support and computer access for student use, including Internet access;
3. The teachers are credentialed and have appropriate training in computer-assisted instruction;
4. The teacher using the Accelerated Reader® program has completed both training seminars and is willing to use this program as recommended by the publisher;
5. Reading instruction is done in a like manner within the two classes; technology will be

the only dissimilar instructional method;

6. The school administration is supportive of the research study;
7. The parents have agreed to their child's participation in the study;
8. The SAT9 scores are a reliable measure of student achievement;
9. Students took the complete SAT9 reading battery in first grade and the scores are on file at the school; and
10. Students are willing to participate in the study.

Limitations

1. The research could be affected by student access to technology at home;
2. The research could be affected by student access to books/literature at home;
3. The research could be affected by previous computer skill development;
4. The research could be affected by student absenteeism;
5. The research could be affected by transient students;
6. The research could be affected by teacher attitude toward computer-assisted instruction and the Accelerated Reader® program; and
7. The research could be affected by individual student's test anxiety both on the Accelerated Reader® quizzes and tests and the SAT9.

Delimitations

The boundaries of this study are limited to two second grade classes at Stevenson Ranch Elementary School in Stevenson Ranch, California.

Review of Related Literature

It is a primary responsibility of educators to teach students to read. The correlation between a student's ability to read and their success in school is overwhelming. In Becoming a Nation of Readers, the ability to read is defined as:

The process of constructing meaning from written texts. It is a complex skill requiring the coordination of a number of interrelated sources of information. (Anderson, Hiebert, Scott, & Wilkinson, 1985, p.7)

The No Child Left Behind Act of 2001 tasks educators with the mandate to create programs to teach reading that are based on scientific research and to ensure children are reading at or above grade level by the end of third grade. Funding for research and implementation will be increased to ensure educators have the best available resources to teach reading (Bush, 2001). In order to be effective teachers of reading, educators must be able to develop in their students the motivation to read, appropriate strategies for constructing meaning from text, vocabulary skills, reading fluency, phonics, and decoding skills (International Reading Association, 2000). This is not a simple task and is one that requires a mixture of techniques in order to teach a child to read. In her report, Moats (1999) advocates a comprehensive reading program that combines phonics, literature, vocabulary, comprehension, and assessment to effectively teach reading. In the National Council of Teachers of English's Language Arts Standards, the use of technology is encouraged as an integral part of the reading/writing process (Standards for the English Language Arts, 1999).

“Reading instruction aligned with computer-assisted instruction can serve as a powerful teaching tool to assist in helping students reach their potential in reading” (Soe, Koki, &

Juvenna, 2000, p.14). Studies since the mid-sixties regarding the effectiveness of computer-assisted instruction show an increase in reading achievement for students. Current research correlates an increase in reading comprehension with the use of computer-assisted instruction. Even studies that do not correlate an increase in reading achievement note that student attention and interest does increase during computer usage (Singhal, 1998). In their analysis of research based computer-assisted instruction studies prior to 1998, Soe, Koki, and Juvenna (2000) find that the studies are not replications of previous studies and the results have few quantitative methods for review (2000). Tillman's (1995) study of the effect of computer-assisted instruction on reading comprehension, shows that while there were no statistically significant improvements in reading comprehension, each student in the experimental group did increase their score from the pretest to posttest. She cites length of study and selection of subjects as possible drawbacks to a statistical increase. With the passage of the No Child Left Behind Act of 2001, funding for the development of computer-assisted instruction and research is increasing. The goal is to have technology work concurrently with other strategies to improve academic achievement (Bush, 2001).

A computer-assisted learning program that is widely used throughout the United States is Accelerated Reader® by Renaissance Learning. The Accelerated Reader® program consists of literature books, computer-based comprehension quizzes and tests, and computer generated achievement reports to supplement reading instruction. Students read books and take the quizzes or tests before moving on to the next book. Teachers can track growth in skill development by using student progress reports. One of the keys to success with Accelerated Reader® is teacher management of student progress during the program's use (Accelerated Reader, 1999).

By evaluating the gain scores from their fifth and sixth grade SAT9 tests, Mathis (1996) finds no difference in the comprehension scores of his students after using Accelerated Reader. One significant implication of the study is that students chose books below their reading level. In order for the Accelerated Reader® program to support gains in reading comprehension, the student must select progressively more difficult material. In a study to compare Accelerated Reader® to independent reading, the researcher uses the SAT8 test as the pre and post tests, but only allows six weeks for the study. The findings of the research conclude that there is no significant difference between the use of Accelerated Reader® and independent reading. The limitations of this study are length of time, documentation of student reading levels, and the initial comprehension levels of students in the study (Toro, 2001).

In his 1992 and 1993 studies of the effects of literature-based instruction on reading test scores, Paul (1996) shows that the use of the Accelerated Reader® program has a positive effect on gains in standardized reading test scores. These studies correlate the Accelerated Reader® reports and student test scores for over 13,000 students. Both the 1992 and the 1993 studies correlate the number of points a student earns while using Accelerated Reader® with the increase in reading level on test scores. Some significant findings are students using Accelerated Reader® read almost twice as much as students not using the program, younger students improve more than older students, and lower-performing students make more gains than more able readers (Paul, 1996). Note that Paul is an employee of Renaissance Learning (the publisher of Accelerated Reader®).

Computer-assisted instruction does not receive the research attention it requires. Many educators tout the efficacy of computer-assisted instruction in the classroom, but adequate

confirmatory research does not exist to validate these claims. If educators are to justify the expenditure of funds for these programs, more research must be done in order to provide concrete evidence that computer-assisted instruction does positively influence student achievement. Accelerated Reader® is a program that helps to manage independent reading and provides reports of skill growth for students. The development of studies that are significant in length, consistent in implementation, and easily reproducible is critical if Accelerated Reader® is to become a must purchase item for schools.

Method

Subjects

The subjects of this study are 40 second grade students at Stevenson Ranch Elementary school in Stevenson Ranch, California. The school serves a predominately middle class neighborhood. The majority of the students are from the surrounding homes, condominiums, and apartments. The students are randomly selected from a total of 200 students entering the second grade at the school. Through random assignment, efforts have been made to balance the two groups by gender, ethnicity, and academic achievement. Students in the treatment group have been placed in a class of twenty with a credentialed teacher who is trained in computer-assisted instruction and the Accelerated Reader® program. Students in the control group are placed in a class of twenty with a credentialed teacher. All students in the treatment group will be taught basic computer skills sufficient for the use of the Accelerated Reader® program. The school has made a commitment to technology instruction through the purchase of hardware, software, and the employment of two classroom technology specialists.

Materials

The materials required for this study are the SAT9 test for second grade, school records, first grade SAT9 test scores for students in the study, the complete Accelerated Reader[®] program for the treatment group, and the Accelerated Reader[®] books for the control group.

Design and Procedure

This study will examine the effectiveness of the Accelerated Reader[®] program on second grade students' reading comprehension. This study will begin at the start of the school year and continue through the SAT9 testing in the spring of that school year. Both groups of students will have access to the same district adopted reading materials and Accelerated Reader[®] books selected by their assigned teacher. The treatment group will use the full Accelerated Reader[®] program including reports, books, and computer-assisted assessment. The control group will have access only to the books from Accelerated Reader[®] with no teacher prompting for book selection. Students in both groups will be given thirty minutes of sustained silent reading time each day in addition to their district adopted reading instructional time. During sustained silent reading, students in the treatment group will select and read books according to the Accelerated Reader[®] program. Additional time will be allotted for completion of the quizzes. The teacher in the treatment group will be actively involved with the students regarding book selection, reports, and adherence to guidelines. The control group students will not be given guidance while selecting their independent reading materials; they will not be tested on books they select for sustained silent reading. In the spring of the school year, all students will take the second grade SAT9. The percentile increase in the reading scores from the second grade test will be

compared to the student's first grade percentile scores. Points earned and the computer generated reports in the Accelerated Reader® program will be monitored to ensure the student's selection of book reading levels are advancing as skills are mastered; they will not be used as rewards or incentives.

Data Analysis

The design chosen for this study is the Pretest-Posttest Equivalent-Group Design.

Commonly presented in the following symbolic representation (Best & Kahn,1998) :

R O₁ X O₂ X gain = O₂ – O₁ O₁ O₃ = pretests

R O₃ C O₄ C gain = O₄ – O₃ O₂ O₄ = posttests

The X represents the treatment group and the C represents the control group. The selection of the Pretest-Posttest Equivalent-Group Design allows the researcher to compare the gain scores of both the treatment and control groups and to test the significance of any differences between the means. The internal validity is good because between the pre and post tests no confounding variables exist. The external validity is good due to the selection of students using randomization. The independent variables are the two groups and the dependent variable is the gain score from pre to post test. The pretest will be the first grade reading battery from the SAT9. The posttest will be the second grade reading battery from the SAT9. The gain score will be computed based on the percentile increase from the SAT9 first grade reading battery to the SAT9 second grade reading battery. The hypothesis to be tested is that the Accelerated Reader® program has a positive impact on the reading comprehension of second grade students.

The results of this study will be analyzed with the Pretest-Posttest Equivalent-Group

Design. The null hypothesis is there is no difference in the gain scores between the control and treatment groups. The independent sample t-test, $H_0: (\mu_{x\text{ gain}} = \mu_{c\text{ gain}})$, will be used to examine the relationship between the control and treatment group's gain scores. If there is a significant gain, then the null hypothesis will be rejected. Related sample t-tests will be done for each group to test for significant improvement in each group $H_0: (\mu_{\text{pre}} = \mu_{\text{post}})$.

Accelerated Reader[®] quizzes and reports will be used by the treatment group's teacher for monitoring of adherence to the Accelerated Reader program instructions and to ensure student progress toward reading goals and advancement of reading levels.

References

- Accelerated reader. (1999). Denver, CO: Education Commission of the States. (ERIC Document Reproduction Services No. ED 447 420).
- Anderson, R., Hiebert, E., Scott, J., & Wilkinson, I. (1985). Becoming a nation of readers: The report of the commission on reading. Washington, DC: The National Academy of Education.
- Best, J., & Kahn, J. (1998). Research in education (8th ed.). Needham Heights, MA: Allyn & Bacon.
- Bush, G. W. (2001). No child left behind act of 2001. Retrieved April 18, 2002, from United States Department of Education Web site: <http://www.ed.gov/legislation/ESEA02>
- Feldman, S. (2002). Focus on reading. American Teacher, 86, 5.
- International Reading Association.(2000). Excellent reading teachers: A position statement of the international reading association. The Reading Teacher, 54, 235-240.
- Mathis, D. (1996). The effect of the accelerated reader program on reading comprehension. La Salle, IL: Stanford Achievement Tests. (ERIC Document Reproduction Services No. ED 398 555).
- Moats, L. (1999). Teaching reading is rocket science. Washington, DC: American Federation of Teachers.
- Paul, T. (1996). Patterns of reading practice: How differences in reading practices explain differences in schools and students. why every students has a right to 60 minutes of twi time per day. Madison, WI: Institute For Academic Excellence. (ERIC Document Reproduction Services No. 421 691).

- Singhal, M. (1998). Using computers as reading instructional tools: Applications and implications. Tucson, AZ: University of Arizona. (ERIC Document Reproduction Services No. ED 419 225).
- Soe, K., Koki, S., & Juvenna, M. (2000). Effect of computer-assisted instruction (cai) on reading achievement: A meta-analysis. Honolulu, HI: Pacific Resources for Education and Learning. (ERIC Document Reproduction Services No. ED 443 079).
- Standards for the English language arts. (1999). Retrieved April 23, 2002, from National Council of Teachers of English Web site: <http://www.ncte.org/standards/standards.html>
- Tillman, G. (1995). Will implementing reading computer-assisted instruction compared to traditional reading instruction produce more effective comprehension at the elementary level?. Brooklyn, NY: (ERIC Document Reproduction Services No. ED 392 025).
- Toro, A. (2001). A comparison of reading achievement in second grade students using the accelerated reading program and independent reading. Knoxville, TN: Johnson Bible College. (ERIC Document Reproduction Services No. 455 510).