

Did Implementation of Accelerated Reader Program Improve the
Reading Scores of Fourth Grade as Reflected on the WASL?

A Special Project
Presented to
Dr. Jack McPherson
Heritage University

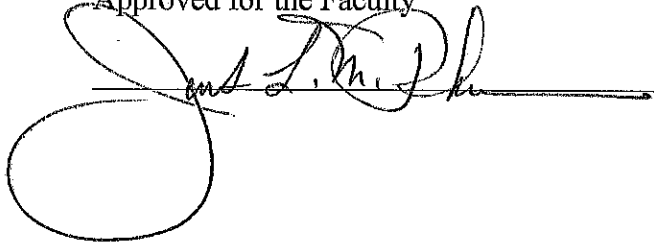
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Masters of Education

Marrie M. Somers
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FACULTY APPROVAL

Did Implementation of Accelerated Reader Program Improve the
Reading Scores of Fourth Grade as Reflected on the WASL?

Approved for the Faculty

 _____, Faculty Advisor

ABSTRACT

The purpose of this experimental research project was to determine whether implementation of the Accelerated Reader program into the curriculum improved WASL reading scores of participating fourth grade students. To accomplish this purpose, a review of selected literature was conducted, related baseline data were obtained and analyzed, and conclusions and recommendations were formulated. This present study focused on No Child Left Behind legislation, the Washington Assessment of Student Learning, and the Accelerated Reader program. The effects of using the Accelerated Reader program with fourth grade students at Christ the King School (CKS), in Richland, Washington, during the 2004-2005 school year was examined.

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CHAPTER 1

Introduction

Background for Project

Over three hundred years ago our ancestors made history with the opening of the first public school in America. The Boston Latin School opened its doors in 1635. (Boston Latin School, 2004). While American education as an institution was in its infancy, it was firmly believed that creating educated citizens was the road to the future. In the early years, reading was established as a crucial focus for advancing the common good of citizens and society. Citizens have held the belief over time that reading was a necessity of life. Literacy was one of the primary ways we imparted knowledge and understanding to others. The nation became a people that recognized the value of imparting knowledge and the crucial role that a good education played in the pursuit of a quality life. At the center of all learning was the ability to read. According to Trelease (1995) “If a nation doesn’t read much, it doesn’t know much.” (p. 7).

Since that time, the education of children evolved and became a focus for every state within the nation. In 2002, President Bush signed the No Child Left Behind Act (NCLB) of 2001. Essentially NCLB established higher achievement standards for all American students. Greater accountability was placed on states, local school systems and schools to meet or exceed the standards outlined in

NCLB. President Bush believed that implementation of the NCLB ensured that every child would receive a quality education.

We've got one thing in mind: an education system that's responsive to the children, an education system that educates every child, an education system that I'm confident can exist; one that's based upon sound fundamental curriculum, one that starts teaching children to read early in life, one that focuses on systems that do work, one that heralds our teachers and makes sure they've got the necessary tools to teach, but one that says every child can learn. And in this great land called America, no child will be left behind. (Bush, 2001).

Each state was tasked to ensure Adequate Yearly Progress (AYP) towards the NCLB act. In Washington State, for example, progress towards achievement of the Essential Academic Learning Requirements (EALRs), has been measured through the Washington Assessment of Student Learning (WASL). According to the Office of Superintendent of Public Instruction authorities:

Following the first operational assessment at each grade level, a standard-setting committee determines the level of performance on the assessments that is required for students to "meet the standard" on the EALRs. In addition, "progress categories" above and below the standard were established to show growth over time as well as to give students and parents an indication of how far from the standard a student's performance

is. School and district performance on the assessments is reported in terms of the percentage of students meeting the standard and in each of the progress categories. (www.k12.wa.us, 2005).

Statement of the Problem

While private schools were not obligated to administer the WASL, Christ the King Catholic School chose to participate in the statewide assessment test as their own measure of academic achievement. The school decided to participate in the WASL testing to ensure continued academic improvement of their students and to compare the achievement of their students to those of the local public schools. Test scores from the WASL indicated some fourth grade students at Christ the King school were not reading at grade level. In an effort to improve reading scores, and to remain competitive with their local public schools, Christ the King School administrators implemented the use of Accelerated Reader (AR) for students in first through sixth grades. Administrators at Christ the King School determined that if they did not improve the reading scores of their fourth grade students they could lose students to public schools. Loss of students equated to loss of funds.

Phrased as a question, the problem, which represented the focus of the present study, may be stated as follows: Did implementation of Accelerated Reader improve the reading scores of fourth grade students, as reflected on the Washington Assessment of Student Learning?

Purpose of the Project

The purpose of this experimental research project was to determine whether implementation of the Accelerated Reader program into the curriculum improved WASL reading scores of participating fourth grade students. To accomplish this purpose, a review of selected literature was conducted, related baseline data were obtained and analyzed, and conclusions and recommendations were formulated. This present study focused on No Child Left Behind legislation, the Washington Assessment of Student Learning, and the Accelerated Reader program. The effects of using the Accelerated Reader program with fourth grade students at Christ the King School (CKS), in Richland, Washington, during the 2004-2005 school year was examined.

Delimitations

Data utilized in the study included fourth grade students from Christ the King School during the 2002-2003 and 2004-2005 school years. The school year from 2002 to 2003 was the last year prior to implementing the AR program at Christ the King. During the 2003-2004 school year, Christ the King introduced the students to the AR program approximately midway through the year. The 2004-2005 school year was the first year in which the AR program was used during the whole year. The study included 35 students from the 2002-2003 school year and 50 students from the 2004-2005 school year. Students who participated during both years completed the WASL in April of their fourth grade academic

year. Students represented a combination of different socioeconomic groups from varied ethnic backgrounds.

Assumptions

The researcher (Marrie M. Somers) believed the following to be true in relation to this study:

1. Students put forth their best efforts on the WASL.
2. Teachers were qualified and capable of administering the AR program and the WASL test.
3. The WASL test was a valid and reliable measure of student abilities.
4. Improvement of fourth grade reading scores on the WASL would be the result of implementation of the AR program.

Hypothesis

It was hypothesized that Christ the King fourth grade students who used Accelerated Reader would have higher reading WASL scores than students who did not participate in the Accelerated Reader program.

Null Hypothesis

Students who used the Accelerated Reader program did not have higher WASL scores than those who used the AR program. Significance was determined for $p \geq 0.05$, 0.01, and 0.001.

Significance of the Project

Administrators at Christ the King School recognized the need to improve reading scores of fourth grade students to remain competitive with public schools. These authorities evaluated the Accelerated Reader program and determined that the wide selection of texts, combined with point incentives given on quizzes, would supplement other reading programs by providing appropriate practice and motivation to improve reading abilities of students. School authorities agreed that if the research hypothesis for the study was not supported, new reading improvement strategies would need to be identified. Finally, it was essential to determine whether adopting AR was beneficial.

Procedure

In September, 2005, the researcher was granted permission by the CKS administrators to undertake the present research design study. Control and experimental groups were identified as follows:

Control group: The control group consisted of 35 fourth grade students who had taken the WASL in the spring of 2003. Students were chosen because they had not used the Accelerated Reader program at Christ the King School.

Experimental group: The experimental group consisted of 50 fourth grade students who had taken the WASL in the spring of 2005. Students were

chosen for the experimental design because they had participated for one full year in the Accelerated Reader program.

A *t*-test for independent samples was utilized for data analysis to determine significance between the control and experimental groups.

Definition of Terms

Significant terms used in the context of the present study have been identified and defined as follows:

Accelerated Reader. A computerized task-level learning information system for the management of literature-based reading.

experimental research. Research in which at least one independent variable was manipulated, other relevant variables are controlled, and the effect on one or more dependent variables was observed.

t-test for independent samples. A parametric test of significance used to determine whether there was a significant difference between the means of two independent samples at a selected probability level.

Washington Assessment for Student Learning. A test utilized in Washington State at the fourth, seventh and tenth grades to measure academic performance.

Acronyms

AERA. American Educational Research Association.

APA. American Psychological Association.

AR. Accelerated Reader.

AYP. Adequate Yearly Progress.

DIF. Differential Item Functioning.

EALRs. Essential Academic Learning Requirements.

ECS. Education Commission of the States.

ESEA. Elementary and Secondary Education Act.

IRA. International Reading Association.

LEA. Local Educational Agencies.

NCLB. No Child Left Behind.

NCLBA. No Child Left Behind Act.

NCME. National Council on Measurement in Education

OSPI. Office of Superintendent of Public Instruction.

TAC. National Technical Advisory Committee.

WASL. Washington Assessment of Student Learning.

ZPD. Zone of Proximal Development.

CHAPTER 2

Review of Selected Literature

Introduction

The review of selected literature presented in Chapter 2 has been organized to address:

- No Child Left Behind Act
- Washington Assessment of Student Learning as a measurement for student progress
- Current Approaches Concerning the Importance and Teaching of Reading
- Accelerated Reader program
- Summary

Research current, primarily within the past five (5) years, was identified through an Educational Resources Informational Center (ERIC) computer search and by means of an internet search. A hand-search of additional selected sources was also conducted.

No Child Left Behind Act

January 8, 2002, was a significant date in the history of American education. On that day, passage of Public Law 107-100, the No Child Left Behind Act, called for comprehensive reform of the Elementary and Secondary Education Act of 1965 (ESEA). NCLBA was aimed at improving the

performance of America's elementary and secondary schools while at the same time ensuring that no child was victimized by his/her enrollment in a failing neighborhood school. (www.ed.gov/nclb, 2005)

The NCLB Act, which reauthorized the ESEA, incorporates the principles and strategies proposed by President Bush. These include increased accountability for States, school districts, and schools; greater choice for parents and students, particularly those attending low-performing schools; more flexibility for States and local educational agencies (LEAs) in the use of Federal education dollars; and a strong emphasis on reading, especially for our youngest children. (www.ed.gov/nclb).

The NCLB Act specified how states would establish academic standards for educating America's youth. This act further required that states adopt, and clearly document, challenging academic content and standards that they would use to raise student achievement levels. As quoted from Subpart 1, Basic Program Requirements, Section 1111, State Plans, (1)(D):

Standards under this paragraph shall include challenging academic content standards in academic subjects that specify what children are expected to know and be able to do; contain coherent and rigorous content; and encourage the teaching of advanced skills; and challenging student academic achievement standards that are aligned with the state's academic content standards; describe two levels of high achievement (proficient and

advanced) that determine how well children are mastering the material in the State academic content standards; and describe a third level of achievement (basic) to provide complete information about the progress of the lower-achieving children toward mastering the proficient and advanced levels of achievement. (www.ed.gov/nclb, p. 7)

In addition to clearly outlined academic standards, the NCLBA clarified accountability standards on how schools would measure educational attainment levels of their students statewide. AYP has been interpreted to include separate measurable annual objectives for continuous and substantial improvement for each of the following:

(I) The achievement of all public elementary school and secondary school students. (II) The achievement of economically disadvantaged students; students from major racial and ethnic groups; students with disabilities; and students with limited English proficiency . . . (p. 3).

The following AYP guidelines and timelines for schools were cited in the NCLBA:

. . . the school shall be considered to have made adequate yearly progress if the percentage of students in that group who did not meet or exceed the proficient level of academic achievement on the State assessments under paragraph (3) for that year decreased by 10 percent of that percentage

from the preceding school year and that group made progress on one or more of the academic indicators (2002, p. 6)

As well as establishing a means to measure student academic achievement, the NCLBA established consequences for schools that failed to educate all students, including those who were disadvantaged. In a sample letter to parents, the OSPI explained how student achievement is measured as follows:

If schools, districts or the state do not make AYP for two or more years in a row, the federal government requires that specific action be taken, including giving parents the option to transfer their children to other public schools or providing extra tutoring and other academic services required to raise student achievement. Ultimately, consistent failure to meet AYP can result in a redistribution or loss of federal funds to schools with large populations of low-income students. (www.k12.wa.us/ESEA, 2005)

Washington Assessment of Student Learning as a Measurement for Student Progress

As mandated by Congress, AYP and NCLB held schools, districts and states accountable for ensuring student achievement. In a 2002 key policy letter, former United States Secretary of Education, Rod Paige stated :

Accountability is central to the success of the No Child Left Behind Act:
States need to set high standards for improving academic achievement in

order to improve the quality of education for all students. Under the NCLBA, each State establishes a definition of “adequate yearly progress” (AYP) to use each year to determine the achievement of each school district and school. The new definition of AYP is diagnostic in nature, and intended to highlight where schools need improvement and should focus their resources. The statute gives States and local educational agencies significant flexibility in how they direct resources and tailor interventions to the needs of individual schools identified for improvement. Under the NCLBA, schools are held accountable for the achievement of all students, not just average student performance. Ensuring that schools are held accountable for all students’ meeting State standards represent the core of the bipartisan Act’s goal of ensuring that no child is left behind. (www.ed.gov/policy, 2005).

The NCLB solidified the need for states to improve the academic performance of their youth through high standards and reliable assessment data. To target student weaknesses with critical curriculum and instructional interventions, educators used the resulting assessment data. As quoted from Part A, Section 1111, b, 3, A of the NCLB legislation assessment expectations were clarified as follows:

Each State plan shall demonstrate that the State educational agency, in consultation with local educational agencies, has implemented a set of

high-quality, yearly student academic assessments in mathematics, reading or language arts, and science that will be used as the primary means of determining the yearly performance of the State and of each local educational agency and school in the State in enabling all children to meet the State's challenging student academic achievement standards

(www.ED.gov/policy, p.7)

A 2004 OSPI publication described learning standards and expectations for kindergarten through tenth grades students. There were four general learning goals, the first of which stated "Read with comprehension, write with skills, and communicate effectively." (2004, p. 2). According the Washington State's OSPI, 2005, the WASL was the primary method for assessing mastery of student learning in the essential academic areas of reading, math, writing and science. In an overview on assessment of student learning, OSPI concluded that the WASL required students to:

. . . select and create answers to demonstrate their knowledge, skills, and understanding in each of the Essential Academic Learning Requirements (EALRs) – from multiple-choice and short-answer questions to more extended responses, essays, and problem solving tasks.

(www.k12.wa.us/assessment, p. 1).

In a 2004 memorandum from the National Technical Advisory Committee (TAC) addressed to Washington State Superintendent of Public Instruction

Bergeson, the reliability and validity of WASL scores were evaluated. While the WASL was not the only method to determine student proficiency in core skills, it was determined to be a reliable measurement by the TAC. Using the Standards for Educational and Psychological Testing as a basis for making professional judgments about the WASL, the TAC evaluated evidence regarding validity and reliability. Essentially the TAC evaluated technical reports containing:

. . . information on test development methods, item content review, item analyses, methods for setting performance standards, evidence for score and inter-rater reliability, evidence for validity of scores, methods of scaling and equating, annual descriptive data regarding statewide performance on the WASL tests, and statewide performance for students in categorical programs, by ethnic groups, and by gender. (2004, p. 1)

In their review of these and other related studies and reports, TAC committee members concluded:

- The WASL meets the relevant standards of validity as prescribed by the national Standards for *Education and Psychological Testing* (AERA, APA, and NCME 1999)
- The test design and the test item specifications for each individual year indicate that the item on the test adequately represents the EALRs for the state of Washington.

- The level of validity and reliability for reporting individual student and school results is acceptable for reading, mathematics and writing.
- Methods used to develop and improve the quality of items and the tests are consistent with standard technical practices for development of criterion-referenced tests.
- The item development and review processes have contributed significantly to the content validity of the assessments.
- The bias sensitivity review and Differential Item Functioning (DIF) analyses that were performed ensure that adequate attention was given to issues of fairness across subgroups.
- The state has used procedures for setting performance standards (including determining method, selecting panelists, summary information) that meet or exceed expectations established by the *Standards for Educational and Psychological Testing* (AERA, APA, and NCME).
- The TAC has approved the procedures to be used to review standards for Reading, Mathematics, and Writing during the spring of 2004.
- Scaling and equating procedures reflect standard practices in measurement. These procedures have been annually reviewed and approved by the TAC.

- The WASL reading and mathematics scales appear to be quite stable over time based on equating studies and other research presented to this committee.
- Equating procedures ensure that the performance standards have remained stable with subject, within grade over time.
- The WASL writing scoring procedures provide stability to the writing scales.
- Inter-rater reliability data suggests that scoring methods are carefully controlled such that there is a high level of inter-rater agreement and that students' total scores are likely to be about the same regardless of the rater.
- Give the opportunities for multiple retakes, the Grade 10 WASL scores are sufficiently reliable and valid to award the Certificate of master. (p. 1).

Current Approaches Concerning the Importance and Teaching of Reading

The State of Washington was committed to improving the reading achievement of its students, particularly its youngest readers. The State's aim was to evaluate and understand the reading abilities of its youngest readers. In an article published by ED.gov., 2004:

Research shows that children who read well in the early grades are far more successful in later years; and those who fall behind often stay behind

when it comes to academic achievement. Reading opens the door to learning about math, history, science, literature, geography and much more. Thus, young, capable readers can succeed in these subjects, take advantage of other opportunities (such as reading for pleasure) and develop confidence in their own abilities. On the other hand, those students who cannot read well are much more likely to drop out of school and be limited to low-paying jobs throughout their lives. Reading is undeniably critical to success in today's society. (ED.gov, p. 13).

In the Seattle Post-Intelligencer, Guest Columnist Jan Maxson, 2005, contended that reading was a skill that every child needed to be competent in and able to apply effectively. Said Maxson:

I would compare the ability to read and write effectively with being able to drive a car. We want our kids to be able to more than just pull out of the driveway. We want them to be able to drive proficiently (and safely) for the situations they are going to face on the road. Similarly, we want our kids to be able to read and write, not just to scrape by, but well enough to get where they want to go. (p. 1)

O'Connor (2000) discussed reading theories, approaches, practices and programs on how children learned to read most efficiently and effectively. This authority examined two of the most widely debated approaches, phonics-based and whole language instruction. Said O'Connor:

Generations of teachers have taught struggling reading by drilling students with exercises in phonics, or the sounds and makeup of words. Kids learned by sounding out words. For the last 20 years, many in the education world have taken up the call for “whole language” which advocates teaching children to read by exposing them to whole words in context. The idea is that if you immerse a child in the sights and sounds of words, and in conversations about reading, a child will eventually pick it up naturally. The debate about whether to use phones or whole language has been long spirited. (p. 2).

Scharer, et.al, (2005) argued that while the acquisition of reading skills was important, the real challenge comes as readers connect with what they read and whether or not they understood what they read. The importance of engagement in reading was described as follows:

Our challenge, then, is not only to ensure acquisition of basic skills but also to guarantee high levels of comprehension and a positive emotional response to reading. Educators have the resources and knowledge to achieve this goal, but we will need to move beyond politics to do so. If we attend to readers, teaching texts, and emotions and are willing to pursue complex solutions to this complex problem, all students can both learn to read and become readers. (p. 28).

Hopkins (2002) contended that merely providing the opportunity and freedom to read would improve reading abilities. If students were given free time, they would choose to read. Hopkins observed:

In some schools, individual teachers include sustained silent reading as part of their programs. In other schools, SSR has been adopted schoolwide. In many schools a special time is set aside each day when every student (and every teacher and staff person, including the principal and the custodian!) is expected to “drop everything” and read silently. Indeed, the main thrust behind most SSR programs is to demonstrate to students that pleasure-reading is something to be valued by all. (p. 2).

Gardiner (2005) was in agreement with Hopkins, as noted in the following statement:

We don't need to spend a lot of money or design complicated programs to help students learn to enjoy reading; we just need to give them time to learn that reading can be enjoyable. (p. 69).

While there was some disagreement about how to teach reading, Cunningham and Stonovich (1998) believed that the earlier a child learns to read the better. These researchers explored the predictors of becoming a successful reader and concluded:

. . . an early start in reading is important in predicting a lifetime of literacy experience – and this is true regardless of the level of reading comprehension ability that the individual eventually attains.

This is a stunning finding because it means that students who get off to a fast start in reading are more likely to read more over the years, and, furthermore, this very act of reading can help children compensate for modest levels of cognitive ability by building their vocabulary and general knowledge. (p. 7).

Another common factor researchers agreed upon was that motivation was crucial in the life an early reader. They believed that if a reader found interest and desire in reading, regardless of their abilities, they would read more and, subsequently, improve their reading abilities. In a 2005 article, Linna observed:

Teachers at Ymmersta School understand that making students eager to read depends more on a motivational learning environment than on a given reading program, and that motivated students will persevere with reading despite difficulties they may encounter along the way. (p. 74).

Accelerated Reader Program

One widely used reading supplement program designed to increase reading practice and to provide motivation to the young reader was Accelerated Reader (AR). According to the Education Commission of the States (ECS) (1999):

Accelerated Reader is a system of computerized testing and record-keeping that supplements the regular classroom reading program. The program is designed to help teachers motivate students to increase substantially literature-based reading practice.” (p. 3).

The AR program components detailed in a 2004 article by Mallette included:

One of the first steps in the AR program, was to determine a student’s zone of proximal development (ZPD) by taking a computerized reading test. The questions were vocabulary based, and required students to choose the best word, from a multiple choice listing, to complete a sentence. Questions continually adjusted to a student’s responses, effectively identifying their reading levels. Once the ZPD and a point goal were established, students chose books of interest that matched their reading abilities and read them at their own pace. (p. 1)

According to the International Reading Association (IRA) (2000) the component of choosing books of interest was important because it was believed to be a motivational factor in reading. The IRA authorities described this process as follows:

Children who read more read better. Children who have access to varied sources of print materials in their classrooms, school libraries, town libraries and at home, and who are allowed to choose what they read, read

more for pleasure and for information. Children who do a substantial amount of voluntary reading are positive about reading and are good readers. (p. 6).

In further describing the AR supplemental approach to reading, the ECS observed that after a student completed reading a designated book they were administered a computer quiz specifically designed for that book. The computer then scored the test, provided immediate feedback to the student, and recorded the results. (p. 3).

The ECS maintained that the reports helped teachers to monitor the progress of their students and tailor instruction based on need. AR provided teachers with data on how much their students had read, how successful they were in understanding key elements of the book, and the level to which they were reading. With detailed information readily at their fingertips, teachers used the data to evaluate how to best assist their students in further reading endeavors. The process used by teachers to assess the data to inform their instruction and to design lessons that would most benefit their students' academic progress and growth was described as follows:

A Diagnostic Report identifies reading problems and allows teachers to intervene as appropriate. A Literacy-Skills Chart assesses each student's proficiency on 24 higher level reading skills, while a Student Report

Record provides a complete list of books read by each student and the scores for each quiz. (p. 3)

Other important considerations identified by ECS authorities relative to the AR supplemental reading program were described as follows:

A crucial element of AR that had to be kept in mind was that the program was a supplement to the regular classroom reading curriculum.

Accelerated Reader was intended to motivate students to read more while giving the teacher information about the books read and the comprehension level attained by the student. The AR program was not intended to act as stand-alone reading program or to replace existing reading curriculum. When used effectively, as a guide to evaluate students' understanding and progress, the AR program helped to inform teachers and motivate students. (p. 6).

The goal of motivating students to read more related closely to the NCLB mandate, which focused on helping young children “. . . children to attain the fundamental knowledge and skills they will need for optimal reading development” (ED.gov, 2004).

Summary

The review of selected literature presented in Chapter 2 supported the following themes:

1. The NCLBA mandated that states adopt and document academic content and standards in an effort to increase student achievement levels.
2. Washington State implemented the WASL to evaluate academic progress of its students.
3. Children who read well in the early grades are far more successful in later years.
4. The AR program was implemented as a supplemental approach to increase reading motivation and achievement.

CHAPTER 3

Methodology and Treatment of Data

Introduction

The purpose of this experimental research project was to determine whether implementation of the Accelerated Reader program into the curriculum improved WASL reading scores of participating fourth grade students. To accomplish this purpose, a review of selected literature was conducted, related baseline data were obtained and analyzed, and conclusions and recommendations were formulated. This present study focused on No Child Left Behind legislation, the Washington Assessment of Student Learning, and the Accelerated Reader program. The effects of using the Accelerated Reader program with fourth grade students at Christ the King School (CKS), in Richland, Washington, during the 2004-2005 school year was examined.

Chapter 3 contains a description of the methodology used in the study. Additionally, the researcher included details concerning participants, instruments, design, procedure, treatment of the data, and summary.

Methodology

The present experimental research study was conducted using two independent groups. The control group was comprised of fourth grade students who had taken the WASL in the spring of 2003 (Appendix A), prior to implementation of the Accelerated Reader program at CKS. The experimental

group (Appendix B) consisted of fourth grade students who had taken the WASL during the spring of 2005 and participated in the AR program for their entire fourth grade year. A *t* test for independent samples was utilized for data analysis to determine significance between the control and experimental groups.

Participants

Included in the researcher's study were all fourth grade students from Christ the King School enrolled during the academic years 2002-2003 and 2004-2005. A large majority of the participants in both the control and experimental groups were Catholic whose socio-economic backgrounds fell within the middle class segment of the population. As a result of including all fourth grade students at CKS, a variety of learners, to include those with special needs, were part of the study.

Instruments

The Washington Assessment of Student Learning provided schools with a means to measure student achievement and target student weaknesses with critical curriculum and instructional interventions. Administered at the fourth, seventh and tenth grade levels, the WASL provided the state with valuable information on how schools were performing across the state. Deemed a reliable measurement tool, the WASL served to assess how well students were meeting the State's Essential Academic Learning Requirements and provided valuable feedback to

school districts, as well as their teachers, to refine curriculum and instructional approaches.

The Accelerated Reader program was designed to motivate students to read more and subsequently improve their reading abilities. Students chose a book of interest, within their zone of proximal development, and then took a computerized quiz designed specifically for the book. The computer scored the test and provided immediate feedback to both the student and the teacher.

Design

This experimental study utilized a two-group post-test to measure the extent to which students' scores on the reading portion of the WASL showed improvement. The design involved two independent post-test groups. The control group was administered a post-test and the experimental group received the intervention (i.e., participating in the Accelerated Reader program for a full year) and then a post-test.

Procedure

During the 2002-2003 academic school year, eighty percent of CKS's fourth grade students passed the reading portion of the WASL. While CKS's performance on this portion of the WASL was above the state average of 66.7% (reportcard.ospi.k12.wa.us/summary, 2003) administrators still believed that to improve teaching and learning, as well as to remain competitive with their public school counterparts, they had to significantly advance student achievement levels.

To improve reading scores, CKS adopted the AR program in grades second through sixth midway through the 2003-2004 academic year. Students participated in the AR program throughout the 2004-2005 school year and completed the reading WASL during the spring of 2005. Data were obtained and analyzed, as presented in Chapter 4.

Treatment of the Data

STATPAK statistical software, in conjunction with accompaniment to the Gay and Airasian, 2003 text, Educational Research: Competencies for Analysis and Application, was used by the researcher to complete statistical and analytical procedures. To test the null hypothesis, which would indicate no significance difference in the test scores of the control and experimental groups, and to determine if there was significant differences between the two groups, a *t*-test for independent samples was performed. Significance was determined for $p \geq 0.05$, 0.01, and 0.001.

The *t*-test allowed the researcher to compare the achievement levels on the reading portion of the WASL between the control group and the experimental group. The following formula was used to test for significance:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right) \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Summary

Chapter 3 provided a description of the research methodology, participants, instruments used, research design, and procedure utilized. Details concerning treatment of the data obtained and analyzed were also presented.

CHAPTER 4

Analysis of the Data

Introduction

In Chapter 4 was organized to include the following: Description of the environment; hypothesis; null hypothesis; results of the study; findings, and summary.

Description of the Environment

The present study focused on reading achievement level(s) of fourth grade students on the WASL. The researcher included fourth grade students from Christ the King School in Richland, Washington, during the 2002-2003 and 2004-2005 academic years. Students in the study were primarily from middle class socio-economic backgrounds. Materials used in the study included the WASL and the Accelerated Reader program.

Hypothesis

It was hypothesized that Christ the King fourth grade students who used Accelerated Reader would have higher reading WASL scores than students who did not participate in the Accelerated Reader program.

Null Hypothesis

Students who used the Accelerated Reader program did not have higher WASL scores than those who used the AR program. Significance was determined for $p \geq 0.05$, 0.01, and 0.001.

Results

A *t*-test was calculated to determine the level of significance between control and experimental groups. Table 1 disclosed the results of the *t*-test while Table 2 represented the distribution of *t* with 83 degrees of freedom.

Table 1.

Summary of *t*-Test for Independent Samples

<u><i>t</i> - TEST FOR INDEPENDENT SAMPLES</u>	
Statistic	Values
No. of Scores in Group X	50
Sum of Scores in Group X	21545.00
Mean of Group X	430.90
Sum of Squared Scores in Group X	9303193.00
SS of Group X	19452.50
No. of Scores in Group Y	35
Sum of Scores in Group Y	14436.00
Mean of Group Y	412.46
Sum of Squared Scores in Group Y	5963806.00
SS of Group Y	9574.69
<i>t</i> - Value	4.47
Degrees of Freedom	83

Table 1 showed 50 scores for group X (experimental) and 35 scores for group Y (control). The sum of scores for X was 21545.00 and Y was 14436.00. The mean of Group X was 430.90 and Group Y was 412.46. The sum of squared Scores in Group X was 9303193.00 and the sum of scores squared for Y was

5963806.00. The degrees of freedom was at 83 and the t value was 4.47. The values used to determine significance were published in the textbook Educational Research: Competencies for Analysis and Applications (Gay and Airasian, 2003, page 561). Table 2 represented the t value with 83 degrees of freedom used in the study.

Table 2.

Distribution of t With 83 Degrees of Freedom

Distribution of t with 83 Degrees of Freedom			
	p		
df	0.05	0.01	0.001
83	2.00	2.66	3.45

The t -test was used to compare treatment group and control groups. The t -value was at 4.47, as noted in Table 1, and the degrees of freedom at the .05, .01, and .001, as noted in Table 2. Significance was determined at the $p \geq .05$ level of 2.00 and all other levels. Accordingly, the null hypothesis was rejected at the .05, .01, and .001 levels. The hypothesis was supported at all levels.

Findings

Data were obtained to compare WASL reading scores of fourth grade students during the years 2002-2003 and 2004-2005 academic school years. The

results demonstrated an increased mean when the treatment Accelerated Reader intervention was utilized. Through statistical analysis, it was determined there was significant difference between control and treatment groups at all levels of $p \geq .05$, $.01$, and $.001$. These findings supported the hypothesis at all levels of $p \geq .05$, $.01$, and $.001$. Additionally, the null hypothesis was rejected at levels of $p \geq .05$, $.01$, and $.001$.

Summary

Chapter 4 reviewed and detailed the description of the environment, hypothesis, null hypothesis, results of the study, and major findings. Data analyzed indicated:

1. The hypothesis was supported (i.e., that Christ the King fourth grade students who used Accelerated Reader would have higher reading WASL scores than students who did not participate in the Accelerated Reader program).
2. The null hypothesis was rejected (i.e., Students who used the Accelerated Reader program did not have higher WASL scores than those who used the AR program).
3. The fundamental research question on which the study focused was answered in the affirmative (i.e., Did implementation of AR improve the reading scores of fourth grade students, as reflected on the WASL?).

CHAPTER 5

Summary, Conclusions and Recommendation

Summary

The purpose of this experimental research project was to determine whether implementation of the Accelerated Reader program into the curriculum improved WASL reading scores of participating fourth grade students. To accomplish this purpose, a review of selected literature was conducted, related baseline data were obtained and analyzed, and conclusions and recommendations were formulated. This present study focused on No Child Left Behind legislation, the Washington Assessment of Student Learning, and the Accelerated Reader program. The effects of using the Accelerated Reader program with fourth grade students at Christ the King School (CKS), in Richland, Washington, during the 2004-2005 school year was examined.

Conclusions

From research findings and an analysis of the data produced by this experimental study, the following conclusions were reached:

1. The NCLBA mandated that states adopt and document academic content and standards in an effort to increase student achievement levels.
2. Washington State implemented the WASL to evaluate the academic progress of its students.

3. Children who read well in the early grades are far more successful in later years.
4. The AR program was implemented as a supplemental approach to increase reading motivation and achievement.
5. The hypothesis was supported (i.e., that Christ the King fourth grade students who used Accelerated Reader would have higher reading WASL scores than students who did not participate in the Accelerated Reader program).
6. The null hypothesis was rejected (i.e., Students who used the Accelerated Reader program did not have higher WASL scores than those who used the AR program).
7. The fundamental research question on which the study focused was answered in the affirmative (i.e., Did implementation of AR improve the reading scores of fourth grade students, as reflected on the WASL?).

Recommendations

Based on the conclusions above, the following recommendations have been suggested:

1. To increase student achievement levels, states should adopt and document academic content and standards.

2. To evaluate the academic progress of its students, Washington State should continue to use the WASL.
3. To ensure students are successful in later years, they need to read well in the early grades.
4. To increase reading motivation and achievement, schools should adopt Accelerated Reader as a supplemental reading program.
5. To improve reading scores of fourth grade students, as reflected on the WASL, the AR supplemental reading program should be adopted.
6. To improve their own students' scores, educators and administrators may wish to adapt information presented in this study, or undertake related research better suited to their individual needs.

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APPENDIX A

WASL Scores for Christ the King School's Fourth Graders

Control Group

WASL Scores for Christ the King School's Fourth Graders Control Group

Student	WASL Reading Score
1	440
2	432
3	395
4	379
5	421
6	440
7	407
8	440
9	421
10	414
11	417
12	407
13	388
14	402
15	400
16	386
17	414
18	405
19	417
20	440
21	426
22	400
23	410
24	397
25	414
26	421
27	426
28	432
29	405
30	393
31	407
32	426
33	386
34	426
35	402

APPENDIX B

WASL Scores for Christ the King School's Fourth Graders

Experimental Group

WASL Scores for Christ the King School's Fourth Graders Experimental Group

Student	WASL Reading Score
1	430
2	415
3	436
4	483
5	412
6	430
7	436
8	426
9	459
10	436
11	459
12	426
13	412
14	430
15	415
16	404
17	412
18	483
19	415
20	430
21	426
22	426
23	445
24	459
25	430
26	400
27	445
28	445
29	426
30	430
31	436
32	459
33	430
34	430
35	402
36	430
37	404
38	426
39	459
40	459

41	430
42	426
43	426
44	415
45	415
46	459
47	426
48	422
49	388
50	422