

A Comparison of Academic Achievement on the Mathematics MAP Test
Between Third Grade ALE Home School Students and Traditional Public School
Students

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FACULTY APPROVAL

A Comparison of Academic Achievement on the Mathematics MAP Test
Between Third Grade ALE Home School Students and Traditional Public School
Students

Approved for the Faculty

_____, Faculty Advisor

_____, Date

ABSTRACT

The purpose of this project was to perform an in-depth quantitative analysis that compared the third grade mathematics Measure of Academic Progress test scores of students enrolled in an Alternative Learning Experience home school program with students enrolled in a traditional public school. Statistical analysis was used to compare the mean, median, mode, standard deviation, and sample variance of the two groups. The results of the study supported that there was a statistical significance and therefore the null hypothesis was rejected and the hypothesis was supported by this study.

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CHAPTER 1

Introduction

Background for the Project

Over the last decade, the number of home schooled students had increased in the United States. According to statistical data, in 2007, the estimated number of students in the United States that were home schooled was 1.5 million (Chang, 2008). In Washington State, there were approximately 16,000 students that were home schooled during the 2008-2009 school year (Annual Report, 2008). In Eastern Washington, an Alternative Learning Experience (ALE) home school program went from approximately 30 students in the 2008-2009 school year to approximately 400 students at the beginning of the 2011-2012 school year. This statistic posed a number of interesting questions. First of all, who were these students that were enrolled in the Alternative Learning Experience home school program? Second, why was there an increase in the number of Alternative Learning Experience home schooled students in this school district? Third, what benefits, if any, were these students gaining from being in an Alternative Learning Experience home school program as opposed to those students who attended a traditional public school? Fourth, did these Alternative Learning Experience home schooled students have an advantage or a disadvantage over public school students?

Statement of the Problem

Alternative Learning Experience programs had become more prevalent in Washington State. A number of parents had chosen to transfer their children from the traditional public school setting to Alternative Learning Experience home school programs. However, the overall effectiveness of these Alternative Learning Experience home school programs had not been determined.

Purpose of the Project

The purpose of this project was to do an in-depth quantitative analysis of students enrolled in an Alternative Learning Experience (ALE) home school setting. This project focused on the academic success using test scores of students enrolled in an Alternative Learning Experience program as compared to test scores of students enrolled in the traditional public school setting.

Delimitations

This project took place in a medium-sized school district in Southeastern Washington State. The demographics of the traditional public school district consisted of 80.2 percent White, 10.4 percent Hispanic, 2.6 percent Black, 4.7 percent Asian/Pacific Islander, 4.5 percent Asian, and 1 percent American Indian/Alaskan Native. Free or reduced priced meals consisted of 28.6 percent of the students. The percentage of teachers meeting the No Child Left Behind (NCLB) highly qualified definition was 98.7 percent. The demographics of the Alternative Learning Experience home school program consisted of 89.2 percent

White, 5.2 percent Hispanic, 3.8 percent Black, 0.3 percent Asian, and 1.4 percent American Indian/Alaskan Native. Free or reduced price meals consisted of 14.7 percent of the students. The percentage of teachers meeting the No Child Left Behind highly qualified definition was 100 percent. For purposes of this project, traditional public school referred to the local public school in which children resided. Traditional home school referred to parent(s) schooling their child at home. Alternative Learning Experience (ALE) home school referred to a setting in which children received a majority of their schooling at home from family, but had the option to attend onsite classes and workshops that were offered through a public school site. For this project, statistical data on test scores covered the time period of the fall of 2011. The participants for this project consisted of 872 third grade students. Eight hundred fifty-two of these students attended third grade at a traditional public school and the other 20 students were enrolled as third graders in an Alternative Learning Experience home school program.

Assumptions

The Measure of Academic Progress test had been used for several years in Washington State school districts. The test had been administered three times a year during the fall, winter, and spring, and test results were instant. The two groups, the public school group and the home school group, were considered equivalent, based on age, grade levels, and demographics.

Hypothesis

Students who attended an Alternative Learning Experience home school program scored the same or better on the mathematics Measure of Academic Progress test when compared to students who attended a traditional public school.

Null Hypothesis

Students who attended an Alternative Learning Experience home school program did not score the same or better on the mathematics Measure of Academic Progress test when compared to students who attended a traditional public school.

Significance of the Project

This project was pertinent to the local school district. The results of this project, if the hypothesis was supported, would be of importance to the school district in that the results could be used to help determine why students in the public school were not scoring as high on standardized tests as those students in an Alternative Learning Experience home school program. The results of this study would also be of significant importance to parents of students enrolled in the Alternative Learning Experience home school program and in the traditional public school program. Those parents who had children enrolled in an Alternative Learning Experience home school program could use the results of this study to determine if their child's Alternative Learning Experienced home school program was helping their child meet or exceed acceptable scores on

standardized tests. Traditional home school parents could also use these results to determine, if the hypothesis was supported, if their children could benefit from enrollment in an Alternative Learning Experience home school program.

Procedure

The researcher started this project by contacting the administrator of an Alternative Learning Experience home school program in Southeastern Washington State. The researcher discussed with the administrator the desire to conduct a study that compared test scores of students enrolled in an Alternative Learning Experience home school program with those students enrolled in the traditional public school. The administrator gave permission for the use of the Measurement of Academic Progress test data scores for those enrolled in the Alternative Learning Experience home school program and the administrator requested Measurement of Academic Progress test data for students enrolled in the public school district.

Definition of Terms

ALE. Alternative Learning Experiences (ALE) was defined as programs in which students received a portion of their education from alternative methods that took place outside of the normal public school classroom setting.

ALE parent/partner programs. An ALE parent/partner program was a program in which students received a portion of their education in their home

environment and a portion of their education in a school setting. Learning and progress was monitored and tracked by the public school personnel.

RIT scale. A RIT scale was a curriculum scale that used individual item difficulty values to estimate student achievement.

Acronyms

ACT. American College Testing

ALE. Alternative Learning Experience

FTE. Full Time Equivalent

GPA. Grade Point Average

HSPE. High School Proficiency Examination

IRT. Item Response Theory

JLARC. Joint Legislative Audit and Review Committee

MAP. Measures of Academic Progress

NCLB. No Child Left Behind

NHES. National Household Education Surveys Program

NWEA. Northwest Education Association

OSPI. Office of Superintendent of Public Instruction

RIT. Rasch Unit

CHAPTER 2

Review of Selected Literature

Introduction

Education has been a very controversial topic in the United States. Education was an area that impacted everyone in society. There had been an increased division in society between those who home schooled and those who sent their children to traditional public schools. This division in education had also led to the creation of numerous types of Alternative Learning Experiences (ALE) that had been implemented into public school systems and the home school society. The topic of standardized tests, such as the MAP tests, had been a controversial topic that had divided parents, students, and schools. For this project, literature subtopics that were selected and reviewed pertained to the area of home schooling, standardized testing and MAP tests, and ALE programs.

Home Schooling

Home schooling in the United States had grown at a rapid rate. This rapid rate had also come with a new view of legitimacy and acceptance of home schooling. According to research conducted in 2005, “Whereas homeschooling has had a dubious legal standing for decades, recent legislative changes indicate a new level of legitimacy” (Aurandi & Davies, 2005, p. 463). The dramatic increase in the numbers of home schooled students was also phenomenal based on the fact that “As late as 1980, homeschooling was illegal in most American states,

and has only realized legal status in all 50 states since 1993” (as cited by Basham, 2001, p. 4, in Aurini & Davies, 2005, p. 463). According to the 2005 secondary literature research conducted by Aurini and Davies, home schooling was growing markedly across North America. The United States National Household Education Survey (2008) reported that approximately 1.5 million students were home schooled in the United States in 2007. This survey showed an increase from the estimated 1.1 million students who were home schooled in 2003. The survey further concluded that the percentage of students who were home schooled increased from 2.2 percent in 2003 to 2.9 percent in 2007. According to the survey, “The increase in the homeschooling rate (from 1.7 percent in 1999 to 2.2 percent in 2003 to 2.9 percent in 2007) represents a 74 percent relative increase over the 8-year period and a 36 percent relative increase since 2003” (NHES, 2008, p. 2).

According to the Office of Superintendent of Public Instruction (OSPI) Home-Based Instruction Annual Report for 2007-2008, the number of registered home schooled students in Washington State was 19,541 and the number of registered part-time home schooled students were 3,923. The number of registered home school families in Washington State was 13,566. During the 2008-2009 school year, the OSPI Home-Based Instruction Annual Report documented 16,577 home schooled students, 3,515 part-time home schooled students, and 10,787 home school families. The 2010-2011 report documented

15,187 registered home schooled students, 3,443 part-time home schooled students, and 10,609 registered home school families. Based on these numbers, Washington State appeared to have a decrease in the number of home schooled students. However, these reports did not document the number of home schooled students that graduated, and therefore it could not be determined if the decrease in numbers was due to students graduating or returning to public school settings.

Numerous studies had been conducted regarding home schooling. These research studies have covered numerous areas of home schooling ranging from standardized test scores of home schooled students to the social impacts of home schooling. According to research by Brian D. Ray, “More than two decades of research have shown that homeschooling is associated with relatively high academic achievement, healthy social, psychological, and emotional development, and success into adulthood for those who were home educated” (2005, p. 2).

Research of literature on the topic also suggested that the reasons why families chose to home school varied greatly. Research literature supported the idea that there was no one set reason why families home schooled but instead that there was a vast range of reasons that led to the growth in the number of students that were home schooled in the United States. The NHES survey concluded that, “in 2007, parents homeschooled their children for a variety of reasons, but three reasons-to provide religious or moral instruction, concern about the school

environment, and dissatisfaction with the academic instruction at other schools- were noted as most important” (NHES, 2008, p. 3). Research by Eisenberg also concluded that families chose to home school for both academic and religious reasons. Eisenberg further concluded that older children were more likely to be home schooled for behavioral reasons or special needs (Eisenberg, 2007).

Standardized Tests

Regarding standardized tests, literature suggested that home schooled students tended to score higher than public school students. The research of Rudner (1999), Richman (2005), King (2004) and Golden (2001) (as cited by McReynolds, 2007), showed trends of this higher achievement on standardized test scores by home schooled students. King’s and Golden’s research focused on ACT and SAT scores of home schooled students. Golden’s research also concluded that once home schooled students reached the college level, they tended to have higher grade point averages than traditional public school students (as cited by McReynolds, 2007). Numerous studies that pertained to standardized test scores and overall academic success of home schooled students at the college level had also been conducted at colleges throughout the United States. One such study, conducted by Michael Cogan, at a medium sized doctoral institution located in the Midwest United States concluded that:

Descriptive analysis reveals homeschool students possess higher ACT scores, GPAs and graduation rates when compared to traditionally-

educated students. In addition, multiple regression analysis results reveal that students, at this particular institution, who are homeschooled, earn higher first-year and fourth year GPAs when controlling for demographic, pre-college, engagement, and first-term academic factors. (Cogan, 2010, p. 24)

Brian Ray's nationwide study also concluded that home schooled student achievement test scores were exceptionally high when compared to public school students (Ray, 2005). The research of Martin-Chang, Gould, and Meuse (2011) also supported that those students who were home schooled in a structured environment, taught with organized lesson plans, achieved higher standardized scores compared with children that attended public school. However, Martin-Chang, Gould, and Meuse's study also concluded that those students who were home schooled in an unstructured environment, taught without organized lesson plans/schedule, scored lower on standardized tests than structured home schooled students and public school students.

An article by Dr. Brian Ray in the 2004 *Journal of College Admission* stated that, "in study after study, the homeschooled scored, on average, at the 65th to 80th percentile on standardized academic achievement tests in the United States and Canada, compared to the public school average of the 50th percentile" (Ray, 2004, p. 2). Ray's article also concluded, that in the 1999-2000 school year, home schooled students scored an average of 568 on the verbal sections of the

ACT and SAT tests, while the public school student scored an average of 501. In addition, home schooled students scored around 532 in math while public school students scored around 510.

Further research in 2005 by Dr. Brian Ray also supported that home schooled students scored higher than public school students on standardized tests. Ray concluded that “Homeschool student achievement test scores are exceptionally high. The mean scores for every subtest (which are at least the 80th percentile) are well above those of public school students” (Ray, 2005, p. 22). In this same study, Ray also concluded that “There are not statistically significant differences in achievement by whether the student has been home educated all his or her academic life, whether the student is enrolled in a full-service curriculum, whether the parents knew their student’s test scores before participating in the study, and the degree of state regulation (control) of homeschooling...” (Ray, 2005, p. 22).

Another study, conducted by Michelle Wichers, was a qualitative study that examined professional literature to prove or disprove that home schooled students performed as well or better academically as compared to traditional schooled individuals. Wichers’ study concluded that home schooled students did perform as well or better academically than traditional schooled students. Wichers’ study further concluded that “it was not a disadvantage for students seeking admission to college from homeschooled environments” (Wichers, 2001,

p. 148). Instead, the study concluded that, at the time the study was conducted, “there were over 150 colleges and universities in the United States that were actively recruiting homeschooled students due to their reading comprehension, their know how to access and use information and their commitment to learning” (Wichers, 2001, p. 148).

A standardized test that had been used to track student progress, especially in Washington State, was the Measure of Academic Progress (MAP) test. The MAP test was created by educators and distributed by Northwest Education Association (NWEA, 2012). The first MAP tests were administered in 2000 to 17,000 students. By 2003, NWEA had partnered with more than 1,200 school districts across the United States and administered around 3 million MAP tests to students. The NWEA compiled and tracked data associated with MAP test results. The MAP test administered in Washington State had been aligned with the state’s standards. The MAP test used a RIT scale. A RIT scale was defined as a curriculum scale that used individual item difficulty values to estimate student achievement (NWEA, 2012). The RIT scale had an equal interval scale, meaning that the difference between scores was the same regardless of whether a student was at the top, bottom, or middle of the RIT scale. The RIT scale was constructed based on the Item Response Theory (IRT) model conceived by Danish mathematician Georg Rasch (NWEA, 2012). The RIT scale was aligned with Washington State’s Measurement of Student Progress (MSP) and High

School Proficiency Exam (HSPE). The NWEA conducted a study in 2011 that concluded there was a slight correlation between MAP RIT scores and scoring proficient or above on the MSP or HSPE tests. The NWEA 2011 study concluded that students who scored within their RIT score for their grade level would also score within the proficient or above area on the MSP and/or HSPE test(s). The NWEA 2011 study concluded that this study supported that the MAP test was aligned to the Washington State standards.

Alternative Learning Experience (ALE) Programs

Alternative Learning Experience programs had only been implemented in Washington State since the late 1980s. During the 1990s Washington State experienced an increase and awareness of ALE programs. The Alternative Learning Experience Programs Study Report 05-17 (2005) defined how ALE programs were implemented in Washington State. According to this study, the Office of Superintendent of Public Instruction (OSPI) established the rules that governed ALE programs in 1988 and then amended the ALE rules in 1995. In the beginning, ALE programs were only available for high school students, but the amendments added in 1995 opened ALE programs to students in grades K-8. The 1995 amendment also allowed parents/guardians to provide a portion of the ALE at home under school personnel supervision.

The study, which was conducted by the State of Washington Joint Legislative Audit and Review Committee (JLARC), stated that during the 2004-

2005 school year, there were 272 ALE programs operated by 158 school districts in Washington State, which accounted for 19,427 full-time equivalent (FTE) students, or approximately 2 percent of Washington State's total K-12 public school enrollment (JLARC, 2005). According to OSPI, ALE programs were defined as programs in which students received most of their instruction in an off-campus setting, but the public school district claimed these students under the school's Basic Education funding. During the 2004-2005 school year, the Basic Education apportionment funding that was claimed per FTE student was \$4,088. Based on this number, the state provided approximately \$79.4 million dollars of annual Basic Education funds for students enrolled in ALE programs. Out of that \$79.4 million dollars, approximately \$36.8 million were provided to ALE parent/partner programs. The JLARC study identified 101 parent/partner programs in Washington State during the 2004-2005 school year. These 101 parent/partner programs enrolled approximately 9,000 FTE students, or about 46 percent of all Washington State ALE students.

Parent/partner programs were defined in the JLARC study as programs that provided varying types and levels of educational and instructional assistance to families who provided some of their children's education at home. In this type of program, the school district personnel were responsible for developing the student's learning plan, monitoring progress and assessing performance. These programs were distinguished from traditional home schooling because the school

personnel retained all supervisory responsibility over the instruction provided at home and at school.

The JLARC study further examined six areas of concern that centered around parent/partner ALE programs. The six areas addressed in the study were: general regulatory framework, quality assurance requirements, program oversight and accountability, use of religious curriculum and materials, program funding and spending, and issues of concern to home-schooling interests. The literature reviewed also concluded that “no other state offers a program identical to Washington’s parent/partner programs and that only two states-California and Alaska-fund programs that could be considered at all similar” (JLARC, 2005, p. 6).

The study concluded that the main problem with the ALE parent/partnership programs were that administrative rules governing these programs had been inadequate in terms of providing for and ensuring overall quality assurance. Another conclusion of this study was that there was no centralized control or oversight of the programs and a lack of participation by OSPI in monitoring these programs. Since this study was released, numerous administrative rules governing ALE parent/partnership programs have been changed and proposed by OSPI and also by bills in the Washington State Legislature. One bill that was introduced and passed by the 2011 Washington State Legislature was ESHB 2065. Bill ESHB 2065 led OSPI to file a permanent

rule-making order on August 22, 2011, that made substantive changes to ALE programs during the 2011-2012 school year. These changes affected how parents/families were reimbursed for learning experiences and materials, how much funding school districts and ALE programs received per student enrolled, and new reporting and documentation requirements to track program expenditures and student progress (OSPI, 2012).

Due to the fact that ALE parent/partner programs were unique to Washington State, the amount of literature and research that pertained to these types of programs was very limited. ALE programs were a new area and therefore, not much research, outside of the Washington State Legislature and OSPI, was available. Research that was available for ALE parent/partner programs focused on the funding and requirements of school districts. Research that focused on the academic achievement of students enrolled in ALE parent/partner programs was an area that required more research and studies to be conducted.

Summary

Home schooling was an area in which a large amount of research had been conducted. Primary research themes appeared to support that the number of home schooled students had drastically increased. Research further supported that reasons for home schooling could not be linked to one specific reason, but instead

varied greatly and depended on numerous factors that ranged from personal, medical, behavioral, and religious reasons.

The area of standardized testing, in regards to home schooled students, was an area that had also been researched extensively. Primary research themes appeared to support that home schooled students scored better than public school students on standardized tests. The literature supported this conclusion not only on standardized tests at elementary and high school levels, but also on college associated tests such as the SAT and ACT. Research on the MAP test was more limited. The available research was limited primarily to the NWEA website and the NWEA's studies of the MAP test. There have not been many studies conducted on MAP scores in relation to comparison of home schooled students to public school students.

Alternative Learning Experience program research suggested that this was a new area of research. In particular, ALE programs that pertained to home schooled students, or parent/partner programs, was a new concept. Research themes supported that these types of programs had grown in enrollment numbers and the numbers of school districts that had implemented these programs. However, research pointed out that ALE parent/partner programs were primarily unique to Washington State, and thus, the amount of research available on the topic was quite limited. Further, the research that was available focused on the implementation, funding, and regulation of these programs. Research that

pertained to the academic progress of students enrolled in ALE parent/partner programs was lacking, and therefore required more research to determine the academic progress of students enrolled in these programs.

CHAPTER 3

Methodology and Treatment of Data

Introduction

The purpose of this study was to examine if a relationship existed between test scores and whether a student attended a traditional public school or an ALE home school program. To examine this relationship, the study used an experimental design that analyzed standardized test scores and examined these test scores to compare the mean, median, and modes between the two groups.

Methodology

For this study, the researcher used a quantitative experimental research method. Experimental research was considered the most structured of all research types (Gay & Airasian, 2003). This type of research was chosen to test the hypothesis to find out if a cause and effect relationship was identified.

Participants

Participants for this study were selected from the population of third grade public school and ALE home schooled students in a medium sized-school district in Southeastern Washington. The pool of participants for each group consisted of students with similar demographics based on demographical data from both schools' populations. The ALE home school group consisted of 20 third grade students. The public school group consisted of 852 third grade students. The public school participants were chosen from a convenience sample size from the

local public school district. The ALE home schooled students were chosen from a convenience sample size from the same public school district.

Instruments

The mathematics MAP test was used as the measuring instrument. The test was designed to measure individual student performance in mathematics for the specified grade level. The test was designed to give instant results in the form of a RIT scale, which was defined by the creators of the test as a curriculum scale that used individual item difficulty values to estimate student achievement (NWEA, 2012). The RIT scale had an equal interval scale, meaning that the difference between scores was the same regardless of whether a student scored at the top, bottom, or middle of the RIT scale. The RIT scale was constructed based on the Item Response Theory (IRT) model. Content validity was good.

Design

The design used in this study was the posttest-only control group design. This design provided control for most sources of validity, except for mortality. However, mortality was not a problem to this study because no students dropped from either group during the testing period.

Procedure

The control group consisted of 852 students who were taught in third grade at a traditional public school. The experimental group consisted of 20 students who were enrolled in third grade as students in the ALE home school

program. In the fall of 2011, each participant was administered the third grade mathematics MAP test. After the test was administered, the test scores were recorded for each participant.

Treatment of the Data

The test scores for this study were analyzed using STAT PAK software and descriptive statistics as outlined in *Educational Research: Competencies for Analysis and Applications* (Gay & Airasian, 2003). STAT PAK was used to determine the mean, median, and mode of the test scores for both groups of participants. In addition to finding the mean, median, and mode, STAT PAK was used to determine the sample variance of both groups. A one-tailed t-test was used on the data to determine significance at the alpha .05 ($p=.05$) level. The results of the mean, median, mode, sample variance, and standard deviation were displayed using graphs. The sample sizes, degrees of freedom, alpha value ($p=.05$), and *t*-test score were displayed in tables.

Summary

The purpose of this study was to analyze standardized test scores to determine if a relationship existed between test scores and whether a student received instruction in a traditional public school setting or an ALE home school program. This study used a quantitative experimental research method to analyze the data. STAT PAK software was used to statistically analyze the data to determine the mean, median, mode, standard deviation, sample variance and one-

tailed t -score of the data. Results were displayed with graphs and tables.

Guidelines by Gay and Airasian (2003) were used to analyze the results of the data.

CHAPTER 4

Analysis of the Data

Introduction

There had been an increase in the number of home schooled students. The increased number of ALE home schooled students raised concerns as to whether or not these home schooled students had an advantage or disadvantage over public school students. Specifically, were these ALE home schooled students scoring as well as or better than public school students on standardized tests?

Description of the Environment

This study took place in a medium-sized school district in Southeastern Washington State. The study used the mathematics MAP test. The test was administered in the fall of 2011. Participants consisted of 872 third grade students. Eight hundred fifty-two of these students attended a traditional public school and 20 students attended the ALE home school program. The demographics of the traditional public school district consisted of 80.2 percent White, 10.4 percent Hispanic, 2.6 percent Black, 4.7 percent Asian/Pacific Islander, 4.5 percent Asian, and 1 percent American Indian/Alaskan Native. Free or reduced priced meals consisted of 28.6 percent of the students. The percentage of teachers meeting NCLB highly qualified definition was 98.7 percent. The demographics of the ALE home school program consisted of 89.2 percent White, 5.2 percent Hispanic, 3.8 percent Black, 0.3 percent Asian, and 1.4 percent

American Indian/Alaskan Native. Free or reduced price meals consisted of 14.7 percent of the students. The percentage of teachers meeting NCLB highly qualified definition was 100 percent.

Hypothesis

Students who attended an Alternative Learning Experience home school program scored the same or better on the mathematics Measure of Academic Progress test when compared to students who attended a traditional public school.

Null Hypothesis

Students who attended an Alternative Learning Experience home school program did not score the same or better on the mathematics Measure of Academic Progress test when compared to students who attended a traditional public school.

Results of the Study

After the 2011 mathematics MAP test was administered, the test results of the public school students and the ALE home schooled students were compared. Table 1 portrayed the sample size for each group. The experimental group (ALE home schooled students) consisted of 20 samples. The control group (public school students) consisted of 852 samples. The total number of samples for this study was 872 students.

Table 1
Sample Sizes

Group	Sample Size
Experimental Group (ALE home schooled students)	20
Control Group (public school students)	852
Total number of samples	872

As Figure 1 indicated, the mean, median, and mode scores of the experimental group (ALE home schooled students) were slightly lower than the control group (public school students). The mean, median, and mode scores for the ALE home schooled students were 187.45, 187, and 173, respectively. The mean, median, and mode scores for the public school students were 193.72, 195, and 194, respectively. Based on the data displayed in Figure 1, the test results did not show a normal distribution. The test results showed a skewed distribution. The experimental group's scores resulted in a positively skewed distribution because the mean was greater than the median. The control group's scores resulted in a negatively skewed distribution because the mean was less than the median.

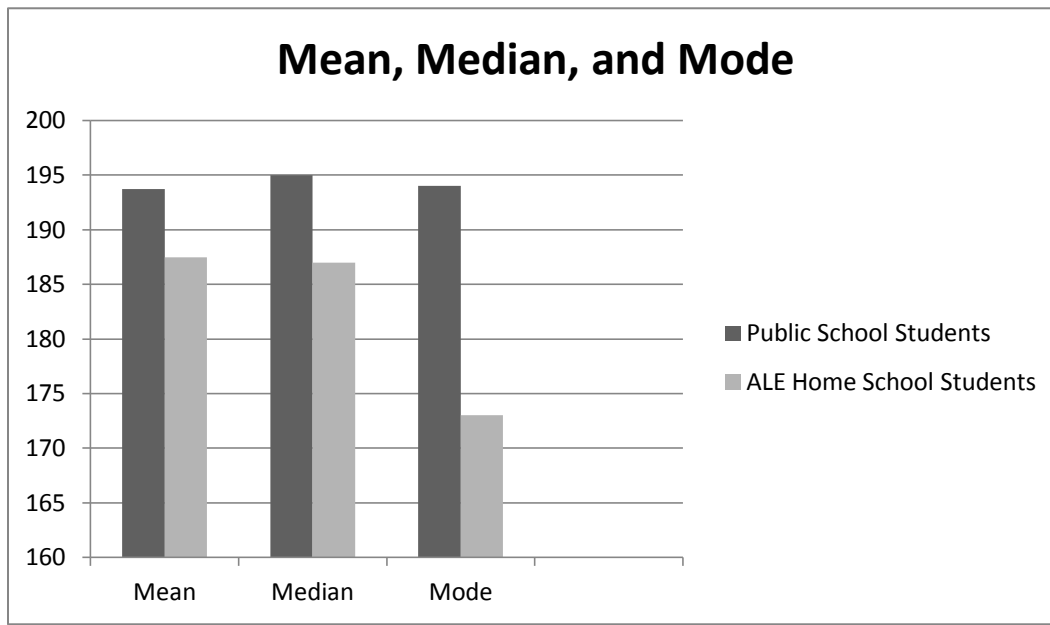


Figure 1. Mean, median, and mode of mathematics MAP test scores for third grade public school students and third grade ALE home schooled students.

Figure 2 displayed the standard deviation for the two groups. As indicated in Figure 2, the standard deviation for the experimental group (ALE home schooled students) was 15.09. The standard deviation for the control group (public school students) was 14.40. The sample variance for the ALE home schooled students was 227.63. The sample variance for the public school students was 207.31.

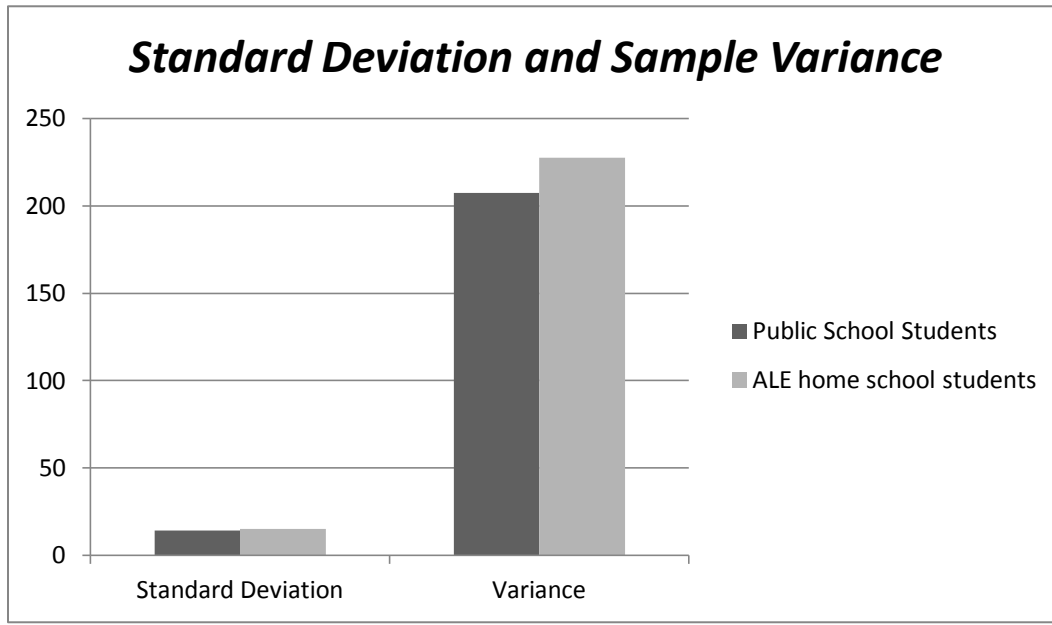


Figure 2. Standard deviation and sample variance for third grade public school students and third grade ALE home schooled students.

Table 2 portrayed the one-tailed t -test score, the degrees of freedom, and the distribution of t at the .05 alpha level ($p=.05$). The one-tailed t -test score was 1.79. The degrees of freedom (df) was 870. The distribution of t at the .05 alpha level ($p=.05$) was 1.647. The t -test score of 1.79 was greater than the value of t at the .05 alpha level ($p=.05$), with the degrees of freedom at 870, and therefore, the null hypothesis was rejected.

Table 2

Distribution of t

One-tailed <i>t</i> -test score based on the mean score	1.79
Degrees of Freedom (df)	870
Value of <i>t</i> at the alpha .05 level ($p=.05$) when $df=870$	1.647

Note. The value of *t* at the alpha .05 level was based on the *Statistical Tables for Biological, Agricultural and Medical Research* of Fisher and Yates as referenced in *Educational Research: Competencies for Analysis and Applications* (Gay & Airasian, 2003).

Findings

The test scores between the two groups were very close. The mean, median, mode, standard deviation, and sample variance were quite close. The use of the one-tailed *t*-test between the means of the two groups identified a statistically significant probability of 95 percent ($p=.05$) that a relationship existed between test scores and attendance in an ALE home school program. Therefore, based on the analysis of the data ($1.79 > 1.647$), the null hypothesis was rejected and the hypothesis was supported.

Discussion

This study had the same results as previous studies that examined the test scores of home schooled students on standardized tests. This study further supported the trend that home schooled students scored the same or better than public school students on standardized tests. The results of this study supported

the same results that have been concluded in previous studies conducted by Ray, Wichers, Golden, King, and Martin-Chang. Literature research had suggested that the number of home schooled students in the United States had rapidly increased. The results of this study were pertinent to determine if these home schooled students had an advantage or disadvantage over public school students in regards to standardized test results.

Summary

During the fall of 2011, the mathematics MAP test was administered. The researcher of this project conducted a study that tested the hypothesis that students who attended an Alternative Learning Experience home school program scored the same or better on the mathematics Measure of Academic Progress test when compared to students who attended a traditional public school. This study also tested the null hypothesis that students who attended an Alternative Learning Experience home school program did not score the same or better on the mathematics Measure of Academic Progress test when compared to students who attended a traditional public school. The hypothesis and null hypothesis were tested by statistical analysis of the mean, median, mode, standard deviation, sample variance, and distribution of t based on a one-tailed t -test of the means of the experimental and control groups at the alpha .05 level. The t -test score of 1.79 at 870 degrees of freedom at the alpha .05 level resulted in the null hypothesis

being rejected. Based on the t -test score, the hypothesis was supported at the alpha .05 level.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

The number of home schooled students had increased in the United States. With the growth in the number of home schooled children and an increase in ALE programs, research was needed to determine if ALE home schooled students had an advantage or disadvantage when compared to public school students. The purpose of this study was to do an in-depth quantitative analysis of students enrolled in an ALE home school setting. This project focused on the comparison of standardized academic test scores of ALE home schooled students and public school students.

Summary

The United States had an increase in the number of home schooled students and ALE programs. With this increased number of alternative programs and home school families, research was needed to determine the effectiveness and impact of these ALE home school programs on student achievement. Specifically, were these ALE home schooled students scoring the same or better than public school students on standardized tests, or were these students scoring lower than public students? To address this problem, the researcher conducted a study in a medium-sized southeastern Washington State school district. The study used the mathematics MAP test scores of 20 third grade students enrolled in an

ALE home school program and 852 third grade students who were enrolled in the traditional public school.

A review of selected literature on the subtopics of home schooling, standardized tests, and ALE programs was conducted. The review of selected literature supported that home schooled students typically scored the same or better than public school students on standardized tests. Literature also supported that ALE programs, especially ALE parent/partner programs, had increased, but research on the topic was more focused on the implementation, funding and regulation of ALE programs than the academic achievement of ALE students.

For this project, the third grade Washington State mathematics MAP test was used as the measuring instrument. The study used a posttest-only control group design. This design was chosen because it provided control for most sources of validity, except for mortality. However, mortality was not a problem for this study because no students dropped from either group during the testing period.

STATPAK software and descriptive statistics were used to analyze the mathematics MAP test scores. Statistical analysis was done to determine the mean, median, mode, standard deviation, and sample variance of both sample groups. A one-tailed t -test based on the mean value of the two groups was used to determine if a statistical significance was evident at the alpha .05 level ($p=.05$) with a degrees of freedom of 870. The t -test value of 1.79 was greater than the

alpha .05 level value of 1.647 at 870 degrees of freedom, and therefore the null hypothesis was rejected and the hypothesis was supported.

Conclusions

The review of selected literature on the subtopics of home schooling, standardized tests, and ALE programs supported that home schooled students typically scored the same or better than public school students on standardized tests. Literature also supported that ALE programs, especially ALE parent/partner programs, had increased, but research on the topic was more focused on the implementation, funding and regulation of ALE programs than the academic achievement of ALE students.

As illustrated in Figure 1, the mean, median, and mode for both groups were quite close in number. However, based on these numbers, the results did not show a normal distribution of test scores. The experimental group (ALE home schooled students) had a positively skewed distribution because the mean was greater than the median. The control group (public school students) had a negatively skewed distribution because the mean was less than the median.

Figure 2 indicated that the standard deviation and the sample variance of the two groups was also very close. The results of the *t*-test, as illustrated in Table 2, showed the statistical significance that existed between the two groups. The *t*-test score of 1.79 at the alpha .05 level with 870 degrees of freedom rejected the null hypothesis and supported the hypothesis that students who attended an

Alternative Learning Experience home school program scored the same or better on the mathematics Measure of Academic Progress test when compared to students who attended a traditional public school.

Recommendations

Overall, there appeared to be a research theme that supported that home schooled students scored better than public school students on standardized tests. However, more research studies that focus on ALE home schooled students' standardized test scores as compared to public school students' scores need to be conducted. Most research in this area focuses on funding and implementation of ALE programs instead of student achievement.

The sample size for the ALE home schooled students for this study was very small. The researcher recommends that studies using larger ALE home schooled student sample sizes be conducted in order to further support or reject the findings of this study. Perhaps a study that encompasses all students enrolled in a specific ALE home school program, instead of just one grade level, would provide a larger sample size.

This study did not take into account subgroups that may have existed within the home school group. Further studies that break the home school group down into subgroups and then compares those subgroups to the public school group might prove to be of value. Subgroups that may be considered are students who have only received home schooling, students who have been home schooled

for greater than a certain number of years, and students who have been home schooled for less than a certain number of years.

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