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U N I V E R S I T Y

EFFECTS OF POVERTY FUNDING ON MATH AND

LITERACY ACHIEVEMENT IN ARKANSAS

by

Karen L. Cushman

Dissertation

Submitted to the Faculty of

Harding University

Cannon-Clary College of Education

in Partial Fulfillment of the Requirements for

the Degree of
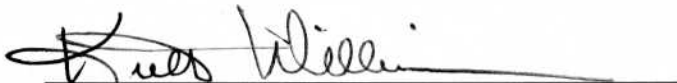

Doctor of Education

in

P-20 Educational Leadership

May 2011

EFFECTS OF POVERTY FUNDING ON MATH AND

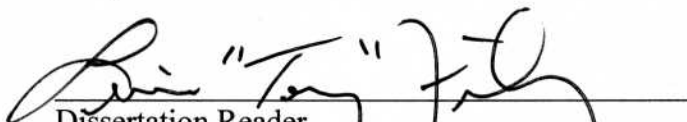LITERACY ACHIEVEMENT IN ARKANSAS

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Dissertation

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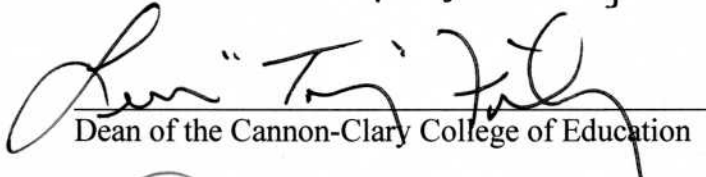_____   4-19-11
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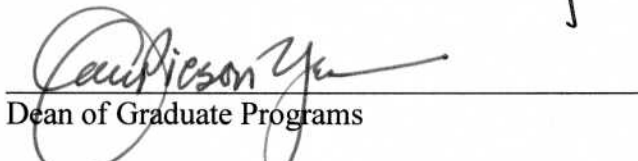
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I will never be able to convey all the thanks deserved by my family. My parents, Mike and JoAnn Cushman, have been there for me throughout the process in so many ways. But most of all, my thanks to them for providing me with the best example of what wonderful, loving, supportive parents do. My two children, Lane and Madelyn Smith,

DEDICATION

I would like to dedicate my degree and research study to my parents, Mike and JoAnn Cushman, and my children, Lane and Madelyn Smith. My parents are the reason the degree was even possible for me to consider. Without their support, encouragement, and prodding, I would have never even started the program. Their unconditional love and support have given me the confidence to believe I can accomplish anything I set out to achieve. My children have gone through more nights and weekends with their mom glued to a computer than I care to admit. Even though they may have, at times, begrudged the time spent, I hope they have learned that hard work and effort will be rewarded. My wish for my children is they understand the importance of education and never take it for granted. They are my life, and I hope they know that mom will always be there to support them throughout their education and life as they have been there for me.

ABSTRACT

by
Karen L. Cushman, Ed.D.
Harding University
May 2011

Title: Effects of Poverty Funding on Math and Literacy Achievement in Arkansas (Under the direction of Dr. Kieth Williams)

This research project was designed to provide a foundational study of the effectiveness of a state categorical fund directed at poverty students called NSLA funding on literacy and math achievement in Arkansas. Poverty funding for students in Arkansas is realatively new and there have not been any studies to examine the impact of this funding to date. Literacy and math achievement scaled scores were evaluated for one year for fourth, sixth, and eighth grades by four NSLA levels, NSLA level 1, NSLA level 2, NSLA level 3, and NSLA level 4.

This causal comparative study was conducted with data from school districts in Arkansas. In the first phase of the study, two school districts were randomly chosen from each of the four NSLA levels (eight school districts in all). The NSLA levels were based on percentages of students who received free or reduced lunches in the districts. Math and literacy achievement were measured in these school districts using scaled scores from the Arkansas Augmented Benchmark Examination.

The sample consisted of 720 students randomly chosen from the eight districts. Thirty students were chosen from each grade level in each district. Descriptive statistics

were reported for the sample, but were not included in the statistical analysis. A series of six one-way analyses of variance (ANOVAs) were used to analyze the data, with NSLA level as the independent variable and math and literacy scores as the dependent variables. Significant differences were found among the different NSLA levels on all six hypotheses; therefore, all six null hypotheses were rejected.

In the second phase of the study, the way in which NSLA program funds were spent in school districts was examined. Six districts were chosen from each of the four funding levels (24 school districts in all), and the percentages of fund expenditures among 11 categories of spending were determined. Descriptive statistics were used to examine the expenditures at each of the four NSLA levels to determine if spending patterns could be found, and if so, which patterns were most effective.

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CHAPTER I

INTRODUCTION

Public school funding has been a topic of debate for decades in the United States. Many different opinions exist concerning how much money should be invested in school districts and how that money should be spent. In Arkansas, the majority of education funding comes from the state budget, which leads to a significant level of debate on how education funds are spent at the state level. Anyone representing an educational group or a group of students can make a convincing argument that the individuals they represent need more money for their cause; however, in a time of very constrained budgets, it is more important than ever that educational dollars be spent efficiently.

Almost 30 years of litigation, starting with *Dupree v. Alma School District* (2003), has led to many changes in the Arkansas public school funding formula. Each legal decision over the years has lead to a new funding system for all public schools in the state. The *Lakeview School District v. Huckabee* (2002) decision led to drastic changes in the way lawmakers viewed public school funding. Court decisions were also a catalyst in prompting state legislators to implement a funding system in which money was allocated to school districts based on the number of students qualifying for a free or reduced-cost lunch through An Act for the Department of Education—Grants and Aids to Local School Districts and Special Programs Appropriation for the 2003–2005 Biennium (R. Harder, personal communication, April 11, 2010). The money appropriated for free or

reduced-cost lunch students through this act is known as National School Lunch Act (NSLA) funds.

NSLA funds are a categorical fund outside the state funding formula known as foundation funding. The intent of creating these funds was that they would be used to help increase achievement for low-socio-economic-status students, due to the large body of evidence that indicates increased funding for poverty students to be successful when measuring student achievement (Odden & Picus, 2003). Since the time of the original passage of the law, the members of the Arkansas State Legislature have increased the amount of funding per eligible student; however, some legislators have communicated that this is not how the taxpayer's dollars should be spent. The researcher's experience as an administrator in the state indicate most administrators in that state believe that NSLA funds are needed and that they have been used to help raise achievement levels for the students for whom they were intended.

Statement of the Problem

There were two research phases in this study. In the first phase, the purpose was to determine the effects of four NSLA levels on districts' literacy and math achievement scores for grades four, six, and eight in Arkansas Public Schools. In the second phase of the study, the purpose was to determine how program expenditures were allocated among 11 categories of spending by the four NSLA levels to determine any spending patterns, and if so, the most effective spending patterns.

Background

The history of the public school funding formula in Arkansas has been changed under the impact of legal challenges throughout the years. These legal challenges have

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been the catalysts to bring about new ways to fund Arkansas public schools. In 1983, the members of the Arkansas Supreme Court found the state's school funding system unconstitutional under the equal protection clause of the state constitution, in *Dupree v. Alma School District* (2003). The members of the court found no coherent relationship to educational needs in the state's method of financing public schools. The equity ruling rejected "local control" as a reason for the disparities of funding and educational opportunities in the state school districts (Access Quality Education, 2008).

The *Dupree v. Alma* (2003) decision was the catalyst for the members of the Arkansas Legislature to pass the *School Finance Act* (1984), the first attempt to require a uniform rate of tax. One part of this act was a requirement that all local districts have a minimum tax rate; however, the consequences were minimal for failure to levy the required tax rate. Another issue with *The School Finance Act of 1984* was the assessment of taxes was not performed under a uniform system across the 75 counties in the state. Personal property was also taxed disproportionately to real property (Dickinson, 2009). The actions of the legislators still did not satisfy the judges and about a decade later, in the *Lakeview School District v. Tucker* 1996 decision, the court members again ruled that the state's educational funding system was unconstitutional. Past decisions were that the state legislators were responsible to provide equity in the amount of resources for each student. In the Lakeview case, the judges took this a step further by stating it was also the responsibility of the state legislators to examine the equality in the educational opportunities provided by those resources. Although the final decision was not handed down until 1996, the state legislators preemptively passed An Act to Levy an Individual Income Tax Surcharge for the Equalization of Public School Funding (1995) and An Act

to Preserve the Local Governance of Schools and to Provide for Equitable Funding and Equal Distribution in Public School Finance (1995) to answer impending lawsuits. These acts included requirements for a uniform 25-mill tax rate for maintenance and operation for all school districts through legislatively referred Constitutional Amendment 74 that was passed in November 1996. The 25 maintenance and operation mills became labeled as the Uniform Rate of Tax. Penalty provisions also were included in these acts for school districts whose administrators did not comply. Another caveat of these acts was that for the first time, local taxes from one district would be used to fund educational opportunities for another school district through the public school funding formula, which was thought at the time to be unconstitutional. This change allowed for true equity throughout the state because all of the money was centralized and was redistributed (Dickinson, 2009).

NSLA Funds

In the most recent court decision in December 2002, *Lakeview v. Huckabee,* for the first time in state history a funding formula was passed that included three categorical funds for students with special needs. One of those funding avenues was the National School Lunch Act (NSLA), which involved additional funds for high-poverty environments and/or students from low socio-economic backgrounds. Funding is based on the number of students qualifying for free or reduced-cost lunches in a district. Even though this legislation was passed several years ago, legislative adequacy hearings within the state over the past five years have shown there to be a group of legislators who have concerns with how the NSLA funds have been spent by the school district administrators. The legislative concerns generally fit into three categories: (a) NSLA funds are not

effective at increasing student achievement, (b) there is an issue with how school district administrators are spending the NSLA funds, or (c) district administrators are carrying over too much of the NSLA funding each year.

Relationship between School Funding and Student Achievement

Not only have there been disputes over school funding at the state level, but disparities over the relationship between equitable school funding and student achievement at the national level have also been discussed for many years. Although some researchers have provided evidence that expenditures are not systematically related to student achievement (Hanushek, 1989), there seems to be more researchers who have found that school resources are systematically related to student achievement and that those relations are strong and educationally important (Greenwald, Hedges, & Laine, 1996a).

An extension of the issue of school funding and student achievement is the argument that more money is needed to fund disadvantaged students. Poverty is the most consistent predictor of academic failure, with the concentration of poverty at the school level exacerbating the problem (Land & Legters, 2002). Researchers have also shown that additional resources for low socio-economic students lead to greater student achievement, especially in math and literacy. In one study, researchers determined a need for additional funds for districts with higher numbers of students of low socio-economic backgrounds (Berne, Stiefel, & Moser, 1999). However, there have not been studies within Arkansas to examine if NSLA funding is related to student literacy or student math. Studies are also lacking in the area of how the NSLA funds are spent.

The state of Arkansas has been in litigation over the past 30 years concerning the public school funding system. Several cases have been filed over the years, but in the most recent case decision, *Lakeview v. Huckabee, 2002,* the judges affirmed that an equitable funding formula does not necessarily mean "equal." They acknowledged that some groups of students might require more funds than are necessary for other groups of students. To help address the specific needs of students of poverty, the members of the Arkansas General Assembly passed An Act for the Department of Education—Grants and Aids to Local School Districts and Special Programs Appropriation for the 2003–2005 Biennium (R. Harder, personal communication, April 11, 2010), adding a categorical fund to the state funding formula called the National School Lunch Act funds or NSLA funds. Under this program, school districts receive funds based on the percentage of students enrolled that qualify for free and reduced-cost lunches. The percentage of students qualifying will reach benchmarks, which are set to increase the amount of funding per student. The act included the following percentages and allocations for school districts:

- **NSLA Funding Level 1.** Districts with a population less than 70% free or reduced-cost lunch received $480 for every free or reduced-cost student.

- **NSLA Funding Level 2.** Districts with a population of 70% to 89% free or reduced-cost lunch received $960 for every free or reduced-cost student.

- **NSLA Funding Level 3.** Districts with a population of 90% and above free or reduced-cost lunch received $1,440 for every free or reduced-cost student.

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This amount of funding per student was in effect until the 2007–2008 school year, when each amount was increased. When the increase was implemented, the members of the Arkansas Department of Education (ADE) presented the updated percentages and allocations:

- **NSLA Funding Level 1.** Districts with a population less than 70% free or reduced-cost lunch received $496 for every free or reduced-cost student.

- **NSLA Funding Level 2.** Districts with a population of 70% to 89% free or reduced-cost lunch received $992 for every free or reduced-cost student.

- **NSLA Funding Level 3.** Districts with a population of 90% and above free or reduced-cost lunch received $1,488 for every free or reduced-cost student.

Although it may seem that the issue has been addressed, dissent remains seven years after the initial NSLA funding over the effectiveness of the NSLA funds and the question of whether district administrators are spending the funds appropriately (this evaluation is based on personal discussions at the Adequacy Hearings in April 2008 and April 2010). Adequacy Hearings are conducted throughout the interim of the legislative session at the Capitol to review data and information to determine if any changes are necessary in the state's educational funding formula to provide an adequate education to all students.

NSLA funds are very restricted in the way they can be spent (ADE, 2009b). The rules and regulations for spending NSLA funds that are promulgated by the staff of the ADE are that they are limited mainly to the following spending categories: teachers'

salaries above the minimum standards, before- and after-school tutoring programs, preschools, tutors, curriculum specialists, classroom teachers' aides, counselors, nurses, social workers, transfers to categorical funds, school improvement plans, and other. During the legislative session of 2007 and during interim study committee meetings, there has been debate over further restricting the way that NSLA funds can be spent. The authors of the *Adequacy Study of 2006*, which was a strong influence on the current Arkansas school funding system, have even suggested that this funding should only be used for tutoring (Odden, Picus, & Goetz, 2006). Many individuals, however, believe that NSLA funds are helping students under the current rules and regulations of allowable NSLA expenditures. The dispute over adding more restrictions to how NSLA funds should be spent could lead to a problem for school district administrators, and most school administrators believe that an even bigger problem will result if the funds are eliminated.

Even though not everyone agrees on how funds should be spent, most people do agree that the purpose of NSLA funds is to raise achievement for low socio-economic students based on the recommendations of the original *Adequacy Report* from Odden and Picus (2003). An analysis of student achievement in math and literacy on the Arkansas Benchmark Exams in select districts is one way to measure whether or not NSLA funds are related to increased student achievement.

Hypotheses and Research Question

Based on the literature review, the researcher generated the following hypotheses. For the first phase of the study, there were six null hypotheses:

1. No significant difference will exist in the literacy achievement of fourth grade students in Arkansas public schools based on NSLA funding.

2. No significant differences will exist in the literacy achievement of sixth grade students in Arkansas public schools based on NSLA funding.

3. No significant differences will exist in the literacy achievement of eighth grade students in Arkansas public schools based on NSLA funding.

4. No significant difference will exist in the math achievement of fourth grade students in Arkansas public schools based on NSLA funding.

5. No significant difference will exist in the math achievement of sixth grade students in Arkansas public schools based on NSLA funding.

6. No significant difference will exist in the math achievement of eighth grade students in Arkansas public schools based on NSLA funding.

For the second phase of the study, the following research question was generated:

7. What percentage of NSLA program funds are allocated in each of the 11 spending categories identified in the study by the four NSLA levels to determine if spending patterns existed, and if so, which spending patterns were the most effective?

Definition of Terms

Allowable expenditures. A term used to describe ways in which NSLA fund may be spent (ADE, 2009b).

Benchmark Exams. The Benchmark Exams include six criterion referenced tests (CRTs) given to students within the state of Arkansas. In Arkansas, the test items are based on the academic standards in the Arkansas Curriculum Frameworks and are

developed by committees of Arkansas teachers with support from the ADE and the testing contractor. CRTs are administered in grades 3-8, End-of-Course Exams in Algebra I and Geometry, and a Literacy Exam at Grade 11 (ADE, 2009a).

Frameworks. These documents include the broad goals and standards of an entire system of education, while giving local school district administrators the freedom to develop a specific program to address the frameworks (ADE, 2009b).

National School Lunch Act (NSLA) funding. An amount that shall be determined by the district's total students identified as eligible to participate in the NSLA Program divided by the district's total enrolled students (ADE, 2009b). The product shall be calculated to one tenth of one percent and rounded up to the nearest whole number from five tenths or down to the nearest whole number from less than five tenths. NSLA funding for Provision 2 districts shall be determined as defined in Ark. Code Ann. § 6-20-2303 (12)(B)(i) and (ii). The district percentage of NSLA eligible students shall be determined from the Arkansas Public School Computer Network's Cycle 2 report for the previous school year. The Child Nutrition Unit of the Department shall verify the Cycle 2 report for accuracy. Adjustments to the Cycle 2 report shall be made by the Department based on documentation provided by the school district. A district's NSLA funding is based on the number of free and reduced priced students times the funding amount as established by the General Assembly. These students are from low socio-economic backgrounds as indicated by eligibility for free-reduced priced meals under the NSLA as determined on the October 1 of the previous year, unless the district participates in the NSLA Provision 2 Program.

Professional development. Professional development is a coordinated set of professional activities that are used to improve the knowledge of teachers, administrators, and paraprofessionals regarding effective instructional strategies, methods, and skills for improving teaching practices and student academic achievement. Training activities for school bus drivers may also be included. Professional development shall result in individual school-wide and district-wide improvement designed to ensure that all students demonstrate proficiency in the state academic standards. Professional development should be based on research, standards-based, and continuous (ADE, 2009b).

Provision Two school district. A school district participating in the NSLA program under 42 U.S.C. § 1759a, as interpreted in 7 C.F.R. § 245.9 (ADE, 2009b).

School district. A geographic area with an elected board of directors that qualifies as a taxing unit for purposes of *ad valorem* property taxes under Ark. Code. Ann. § 26-1-101 et seq. and whose board conducts the daily affairs of public schools pursuant to the supervisory authority vested in it by the General Assembly via Title 6 of the Arkansas Code (ADE, 2009b).

Technology. Any equipment that is used for instructional purposes that is electronic in nature, including, but not limited to, computer hardware, computer software, internet connectivity, and distance learning (ADE, 2009b).

Significance

The results of this study will be of benefit to the members of Arkansas school districts, members of the Arkansas General Assembly, and students in Arkansas Public Schools. Information gathered from this study will be used to provide lawmakers and school personnel with data on the impact of NSLA funding on student achievement. The

study will also be used to provide these parties with information on whether or not there are differences in student achievement based on how NSLA funds are spent. Since NSLA funds are relatively new to the state and there has not been any research on the effectiveness of these funds, this information could prove helpful to Arkansas legislators in making decisions about whether to continue to appropriate NSLA funds in the current status or to amend legislation concerning how districts can spend NSLA funds. Research from the study could show that some NSLA expenditures are more beneficial at raising student achievement than others.

Another benefit of the study could be to provide information to school district administrators to help aid in making decisions on how to spend NSLA funds locally. For instance, if certain expenditures are shown to have minimal benefits in increasing student achievement, personnel from school districts might reduce or eliminate that expenditure in the future and appropriate the money from that expenditure into another avenue that has been shown to be more beneficial in raising student achievement.

Educators from other states could also benefit from this study. Currently, there are not many states in which categorical funding is provided for students of low socio-economic status; however, an increasing number of states are involved in litigation over funding formulas. Conclusions from this study could be used to provide educators in other states with information about the success of such funding.

<div align="center">**Process to Accomplish**</div>

Design

A causal-comparative, non-experimental design was used in this study. The independent variables for the first research question were the four NSLA levels. The

dependent variables for the first statement of the problem were the literacy and math scaled scores from the 2008–2009 Arkansas Benchmark Examination for the students in the sample. For the second research question, descriptive statistics were used to determine what percentages of expenditures were allocated in 11 spending categories by the four NSLA levels to determine if any spending patterns exist, and if so, the most effective spending patterns.

Sample

A stratified random sampling selection process was used to choose participants for the study. First, all 244 public school districts in the state of Arkansas were divided into their current NSLA funding category. There are three levels of NSLA funding. For the purpose of this study, the first funding level, which includes all districts up to 69% free or reduced-cost lunch, was divided into two groups. The first group included all districts with up to 49% free or reduced-cost lunches, and the second group included districts with 50% to 69% free or reduced-cost lunches. There were thus four funding categories into which schools were divided. Second, two districts from each of the four NSLA categories were chosen randomly. Third, from each of the eight districts chosen, 30 students were randomly selected in each of the three grade levels, grades 4, 6, and 8. Student scaled scores in literacy and math from the 2008–2009 Benchmark exam were collected for analysis. Permission was obtained from the superintendents of each of the eight school districts to use their students' data. Identities of school districts and individual students are completely confidential; no identifying information was used.

For the second research question, six districts were chosen randomly from each of the four NSLA categories for a total of 24 districts. Data was collected for the 24 school

districts expenditures from the ADE through the Arkansas Public School Computer Network. The identities of the 24 districts are confidential and no identifying information was used.

Instrumentation

The Arkansas Comprehensive Testing, Accountability, and Assessment Program (ACTAAP) is the foundation for all testing and accountability in the state of Arkansas. Specifically, the Arkansas Augmented Benchmark Examination (AABE) was used to measure the literacy and math achievement in addressing the first research question. Two components comprise the tests for grades 3–8: a criterion-referenced test (CRT) and a norm-referenced test (NRT). The CRT component is focused on establishing student performance levels and contains items specifically designed to align with Arkansas state education standards. The literacy and math performance levels, determined by the 2009 AABE, were used to identify students who were proficient or above, which is considered to be at grade level. Permission to use the data was granted by the district superintendents of the schools in the study.

The members of the ADE (2008) determined the AABE to be both reliable and valid. Researchers at the ADE reported that the AABE have "technically sound levels of reliability, validity, and fairness, based on the extensive research that underlies both the CRT and NRT item sets" (p. 6). The AABE are developed around a common design from year to year (Pearson, 2009). Although the test forms are built around a common design, post-equating is used to control varying levels of difficulty from one version of the test to the next. The Technical Advisory Committee (TAC) noted that these equating methods

are empirical procedures for establishing uniformity between raw scores on different test forms.

Linking items are used to connect one test version to another test version of the AABE (Pearson, 2009). Evaluators use the connection items to place test items on the same scale as the previous year with a common-item, non-equivalent groups-linking strategy. From this linking strategy, parameters are established to ensure consistency between different forms of the test. Accuracy rates were .89 or above for all grades in both literacy and mathematics.

According to the technical report, "The approach approved by the TAC is the Stratified Alpha method. In this approach, reliability for each item type is estimated separately for reliability and then combined with other item types' reliabilities to yield a more accurate estimate of the overall reliability" (Pearson, 2009, p. 59).

The outcomes of these assessments are used to determine adequate yearly progress as mandated in the No Child Left Behind Act. Students in grades three through eight are given approximately two and a half hours daily to complete the four-day test. The test items in both literacy and math include multiple choice and open response questions. The four levels of student achievement on these criterion-referenced exams include advanced, proficient, basic, and below basic. The staff of the ADE (2009) defined the student levels of achievement as follows:

Advanced: Students demonstrate superior performance well beyond proficient grade-level performance. They can apply established reading, writing, and mathematics skills to solve complex problems and complete demanding tasks on

their own. They can make insightful connections between abstract and concrete ideas and provide well-supported explanations and arguments.

Proficient: Students demonstrate solid academic performance for the grade tested and are well prepared for the next level of schooling. They can use established reading, writing, and mathematics skills and knowledge to solve problems and complete tasks on their own. Students can tie ideas together and explain the ways their ideas are connected.

Basic: Students show substantial skills in reading, writing, and mathematics; however, they only partially, demonstrate the abilities to apply these skills.

Below Basic: Students fail to show sufficient mastering of skills in reading, writing, and mathematics to attain the basic level. (para. 15)

According to Pearson (2009), "Each performance category has a range of specific scale scores by grade level in both mathematics and literacy that corresponds to a particular performance level. These scale scores may be utilized to demonstrate academic growth when comparing scale scores from one year to the next" (p. 57).

Data Analysis

Data were collected on NSLA expenditures from the ADE as derived from the financial section of the Arkansas Public School Computer Network (APSCN) for the 2008–2009 school year. The results from the ACTAAP Augmented Benchmark Test were compiled and appropriate statistical tests were conducted to accept or reject the hypotheses. To address the first research question, six one-way analyses of variance (ANOVAs) were conducted using NSLA level as the independent variables and literacy and math scaled scores as the dependent variables. To answer the second research

question, expenditures were reported as percentages in each of the 11 spending categories for the four NSLA levels. The 11 expenditure categories were pre-school, math/literacy/science coaches, teachers' aides, counselors/nurses/social workers, before/after/summer school and tutoring, teachers, curriculum specialists, professional development, transfers to categorical funds, school improvement plans, and other spending. APSCN year-end reports for the 2008–2009 school years were used to report percentages of each category of the overall NSLA allotment for each of the NSLA levels.

CHAPTER II

REVIEW OF RELATED LITERATURE

Funding for poverty students has been a part of public school funding at the national level for decades. As the student achievement gap seems to be increasing between students living in poverty and those who are not living in poverty (Strauss, 2010), it is more important than ever to address this issue at all levels of government and in all schools. Many different opinions exist on whether or not funding for poverty students is necessary, how funding for poverty students should be structured, and also how district administrators should be allowed to spend funds designated for poverty students.

In this chapter, literature is reviewed related to poverty, poverty funding, and the relationship between poverty funding and student achievement. The first section of the review is a conceptual overview of poverty, including an understanding of students who live poverty. The section part of the review is a description of research on the issue of additional educational funding and its relationship to increased student achievement. Next, a history of public school funding for students in poverty is presented, including equity and adequacy challenges manifested in the court cases that were the catalysts for the current Arkansas public school funding formula. The final section includes a description of NSLA funds, including how they can be spent and the challenges that have arisen since their inception.

Conceptual Overview of Students Who Live in Poverty

Before presenting the research regarding funding for low poverty students, it is important to understand the culture of individuals living in poverty. It is also necessary to address the misperceptions that those who are not living in poverty often hold of individuals who are living in poverty. Biddle and Berliner (2002) stated that part of the resistance against equitable funding for schools is due to beliefs about poverty. The first belief cited by Biddle and Berliner is the ideology of individualism that leads to the conclusion that success and failure mainly result from individual effort (Kluegel & Smith, 1986). According to this belief, there would be no reason for additional funding since all responsibility lies with the effort individuals put into their education. Kluegel and Smith (1986) claimed that Americans are known for this ideology; however, this idea can lead to associated beliefs that poor people are to blame for their lack of success. Biddle and Berliner cited the work of Herrstein and Murray (1994) for a second belief about poverty known as essentialism. Essentialism is the belief that groups of less privilege inherit genetic characteristics that cause their lack of successes. Basically, this belief means that people are born with the genes for success or lack of success; therefore, providing additional funds for these students would be a waste of money. The last belief Biddle and Berliner (2002) cited was Moynihan's "culture of poverty" thesis in 1969, which is that impoverished persons and minorities fail because of inappropriate traditions in the cultures of their homes. Again, if this were a belief held by some, it would explain the resistance against additional funding for these students, since it is believed their culture has doomed them to a life of poverty. The research presented by Biddle and Berliner may seem archaic, and some might even say that it is unbelievable that

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Americans could hold those beliefs. Yet, it is based on a large body of research and can be used to explain why many people do not believe that additional funding for students of poverty will be effective in moving them out of poverty.

Understanding how individuals who live in poverty view education is also an important factor in understanding how to educate students living in poverty. Beegle (2007) asked individuals living in poverty to reflect on what education meant to them and their families. Almost all participants expressed the view that "education had little or no importance" (p. 67). Beegle also pointed out that education was a cause of stress for individuals living in poverty.

Payne (2005) is a recognized expert in the United States when it comes to understanding poverty students. She has published many books and provided training in school districts all across the United States about helping students of poverty. She has stated that two things move students out of poverty: Relationships and education. Educators must teach and provide support, insistence, and education. The support referred to can take different forms including emotional, physical, and financial, but for the purposes of this dissertation, financial support will be the focus of discussion.

Students in poverty are often referred to as "at-risk" students in education. Stringfield and Land (2002) gave one definition of at-risk students as those who, through no fault of their own, are at risk of low academic achievement and dropping out before completing high school. In fact, according to Land and Legters (2002), poverty is the most consistent predictor of academic failure, with the concentration of poverty at the school level exacerbating the problem.

Some alarming statistics underlie Land and Legters statement. The 2003 U.S. Census Bureau indicated that 17.6% of U.S. children under the age of 18 lived in poverty (DaNavas-Walt, Proctor, & Mills, 2004). At the same time, researchers at the National Center for Educational Statistics reported that 55% of fourth-grade students and 43% of eighth-grade students who qualified for free or reduced-cost lunches scored below basic levels on the reading section of the National Assessment of Educational Progress. In contrast, only 24% of fourth graders and 19% of eighth graders who did not qualify for free or reduced-cost lunches were below basic levels. Math achievement showed the same pattern, with 38% of fourth-graders and 52% of eighth-graders who qualified for free or reduced-cost lunches being below basic levels as compared to 12% of fourth-graders and 21% of eighth-graders who were not eligible for free or reduced-cost lunches. Looking at these statistics might lead one to suppose that everyone agrees on the necessity of providing additional funds for students of poverty; however, this assumption is incorrect.

Views About Funding and Student Achievement

A question that has been frequently asked in school finance is the following: Does funding matter in terms of student performance? The answer to that question depends on whom you ask. Most educators would resound with a definitive yes, but lawmakers and research communities are more mixed in their answers to that question (Odden & Picus, 2008).

Arguments That Funding Is Not Related to Student Achievement

Hanushek (1986, 1989, 1994, 1997) is one of the most often cited researchers in the field of school funding. Hanushek has argued that there is minimal, if any,

relationship between funding and student success. Although Hanushek's research is highly cited, the same results were reported in earlier studies such as Coleman et al. (1966). The United States Department of Health, Education, and Welfare commissioned this study in response to the Civil Rights Act of 1964. Coleman et al. concluded that school quality and the level of funding had little or no impact after home factors were taken into account; however, the report is believed to have many flaws (Biddle & Berliner, 2002). Some of the flaws cited by Biddle and Berliner included errors that most likely led to reduced estimates for school effects on students' achievements, the lack of use of scaling techniques, and the serious mistakes made when assigning indicators to major variables.

Hanushek's (1986, 1989, 1994, 1997) research findings are more highly regarded, and they have consistently shown that there does not appear to be a relationship between the level of funding and student achievement. Hanushek (1997) analyzed 90 different studies relating to this topic that spanned over a 20-year period and argued that these results have a simple interpretation: there is no strong or consistent relationship between school resources and student performance. In other words, ". . . there is little reason to be confident that simply adding more resources to schools as currently constituted will yield performance gains among students" (pp.148-149).

Arguments That Funding Is Related to Student Achievement

Other researchers who reached different conclusions have regarded the same studies that Hanushek analyzed. Hedges, Laine, and Greenwald (1994a, 1994b), Greenwald et al. (1996a, 1996b), and Laine, Greenwald, and Hedges (1996) concluded that funding does make a difference. The reason for the difference in the conclusions may

be attributed to the difference in the statistical analyses performed by the different researchers (Odden & Picus, 2008). Hanushek (1997) divided the studies into two groups, those showing a positive relationship and those showing a negative relationship. Hanushek found more negative than positive outcomes, and from that, he concluded that there was not a relationship between funding and achievement. Greenwald et al. (1994), in contrast, calculated the effect size of the different studies instead of counting the number of positive and negative outcomes, and then calculated the average effect size. Greenwald's et al. analysis indicated a significantly positive effect size, mainly because the larger effects of the "positive" studies were greater than the smaller effects of the "negative" studies. Odden and Picus (2008) stated that they sided more with Greenwald et al. in believing that effect size is the best way to summarize across these studies.

According to Biddle and Berliner (2002), the relationship between the level of funding and student achievement does exist, and the majority of those researchers that believe otherwise are preemptively hostile to public education. Rothstein (1993) has argued that those that believe there is not a relationship between spending and achievement use numbers that are not an accurate reflection of reality. He stated:

> The assumption that schools keep spending more and getting less is so well established that few analysts bother to question it. For instance, critics of public education often say that the per-pupil spending has more than doubled since the 1960s, even though a careful analysis of the facts show otherwise (p. 4).

Rothstein goes on to add that a valid comparison from the 1990s to the 1960s levels of educational expenditures is inaccurate since it does not include the increased responsibilities that schools have taken on in caring for severely handicapped students,

children of immigrants, school lunches, and transportation. Rothstein reported that it is unfair to say that schools have failed because test scores have not reflected this increase in spending, when much of the spending has not been on academic programs.

In a study conducted in the state of Texas, Ferguson (1991) analyzed school funding and its relationship with student achievement by examining kinds of spending and the use of educational resources. Conclusions from that study were that "hiring teachers with stronger literacy skills, hiring more teachers, retaining experienced teachers, and attracting more teachers with advanced training are all measures that produce higher test scores in exchange for more money" (p. 485).

Wenglinsky (1997) revealed that the details of expenditures made a difference in whether or not there was a relationship between levels of funding and student achievement. Wenglinsky only considered fourth-grade and eighth-grade students. Some of his conclusions for fourth grade students were that increased expenditures on instruction, school district administration, and increased teacher-student ratios led to higher achievement in math. The eighth-grade data showed that reduced class size led to an improved school environment or climate, and the improved climate and reduction of behavior problems led to higher achievement in math. Wenglinsky (1997) established that overall capital outlay, school administration, and teacher education levels could not be correlated to increased student achievement.

Elliot (1998) also found that the way in which financial resources are being used is related to student achievement. Elliot used U.S. census data on school finance and data from the National Education Longitudinal Survey of 1988 to evaluate how financial resources are related to opportunities to learn in United States public high schools.

Elliot's findings were that money matters, but that the specifics of how it is used matter more:

> Both the math and science analyses confirm that money matters and that teaching practices and classroom resources matter, but it is only in the science analyses that the mediating effect between finance and achievement of teaching practices and classroom resources is demonstrated. In the case of math, part of the positive effect of expenditures on achievement was accounted for by the mediating effect of teachers' educational level and years of teaching experience. The relation between finance and class size was unclear, but suggested that the allocation of resources to smaller classes in high poverty schools may not, in and of itself, effectively improve students' achievement. Teaching practices and classroom resources are related to math achievement, but do not mediate the positive relationship between finance and achievement. (p. 239)

Archibald (2006) linked student achievement to funding and also accounted for differences in student learning produced by teachers, which is one of the largest sources of variation in student learning. While the purpose in Archibald's study was to look for specific factors that could be linked to student achievement, the results were that overall funding levels did have a relation to student achievement.

A substantial body of literature leads to the conclusion that additional resources are needed so that impoverished students can be successful in education; however, Baker and Duncombe (2004) suggested that most states significantly underestimate the influence of poverty on the costs of education. Money directed at disadvantaged students brings higher achievement scores (Grissmer, Flanagan, & Williamson, 1998). Grissmer et

al. supported poverty funding when they found, "A more consistent set of evidence is now emerging which shows that disadvantaged students received the largest resource gains and that large score gains occurred among these students" (p. 10). In a case study in New York, it was found that twice the amount of funding was needed to educate poverty students than non-poverty students (Duncombe, Lukemeyer, & Yinger, 2002).

Understanding Equity

Equity is a term that is often referenced when discussing public school funding. In school finance there are two terms dealing with equity in education, horizontal and vertical equity. Understanding vertical and horizontal equity is important in looking at the issue of additional funding for certain groups of students, such as students who are living in poverty. Horizontal equity can be defined as the equal treatment of equals. This definition involves a greater emphasis on the equality of per-pupil funding (Berne & Stiefel, 1984). Vertical equity, defined as the appropriately unequal treatment of unequals (King, Swanson, & Sweetland, 2003), involves the recognition that differently situated children should be treated differently (Berne et al., 1999).

Measuring vertical equity is not as easy as measuring horizontal equity. Berne and Stiefel (1984) stated that researchers must ask three questions when measuring vertical equity:

1. What are the legitimate differences among children that define unequal groups of children?

2. Once the groups with legitimate differences are defined, how should the educational objects vary over these groups?

3. After the appropriate groups and desired object group differences are

    articulated, how should the equity of the actual situation in comparison to the

    desired one to be measured? (p. 411)

Biddle and Berliner (2002) found that the United States had huge disparities in the quality of school buildings, facilities, curriculum, instructional equipment, teacher experiences and qualifications, class sizes, auxiliary professionals, and other resources. Such disparities are not acceptable in other developed countries. Slavin (1999) stated:

>   To my knowledge, the United States is the only nation to fund elementary and
>
>   secondary education based on local wealth. Other developed countries either
>
>   equalize funding or provide extra funding for individuals or groups felt to need it.
>
>   In the Netherlands, for example, national funding is provided to all schools based
>
>   on the number of pupils enrolled, but for every guilder allocated to a middle class
>
>   Dutch child, 1.25 guilders are allocated for a lower-class child and 1.9 guilders for
>
>   a minority child, exactly the opposite of the situation in the United States, where
>
>   lower-class and minority children typically receive less than middle-class white
>
>   children. Poor and minority children always face problems that other children face
>
>   no matter what country, but it is compounded in the United State because they
>
>   usually have to attend poorly funded schools. (p. 520)

Because education is the responsibility of individual state legislators, it is understandable that each state has a different system of education funding. In some states, greater amounts are allotted to poorer districts. In other states, equal amounts of aid are distributed to all districts, rich or poor, exacerbating the problem of unequal resources.

The Road to NSLA Funds

At the national level, the first attempt to provide vertical equity for students in poverty came with the passage of the Elementary and Secondary Act of 1965 in the form of a new federal program called Title I. The intent behind these federal funds was to ensure that all children have the opportunity to obtain a high quality education, and help students who are behind academically (North Carolina Department of Education, 2008). The formula was based on census data about the overall socio-economic status of the local population.

At the state level, court cases have played a vital role in changes to Arkansas school funding laws over the past 30 years. *Dupree v. Alma School District* (2003) and *Tucker v. Lakeview School District* (1996) were two cases heard by the Arkansas Supreme Court that led to changes to the Arkansas school funding system. Although these two cases influenced the current Arkansas school funding formula, they did not play a direct role in initiating of National School Lunch Act. The landmark decision *Rose v. Council for Better Education* (1989) was the pioneer court case heard by the Kentucky Supreme Court that brought the concept of "adequacy" to the forefront of the public school finance debate across the country (Lefkowits, 2004). The Rose Standards, as they became known, were the first time adequacy was used as a benchmark instead of equity. For the first time, members of the courts addressed the issue that some districts and some students require more funding. This meant additional funding for students of poverty.

The first attempt to provide additional funding for impoverished students in Arkansas came in the 1998–1999 school year. These Poverty Index funds were based on the percentage of students in kindergarten and the first grade who qualified for the free or

reduced-cost lunch program in that school. The poverty index level was set by the members of the ADE each year to determine schools that were eligible (ADE, 1999). Then director of the ADE, R. Simon (personal communication, January 11, 2010), stated:

> We secured these funds in our annual budget shortly after Smart Start was launched to help our poorest schools supplement funding for Kindergarten and first grade with the requirement that this money be used specifically to help students in those grades with their reading, writing, and mathematics.

The original Lakeview case led to a second suit in which the state was accused of having an inadequate funding system. This case became known as *Lakeview II*; however, in 1999, *Lakeview I* was appealed to the Arkansas Supreme Court and in 2000, the judges ordered a payment of legal fees to the plaintiffs. *Lakeview II* was dropped (Schoppmeyer, 2001). In November 2002 came the much-anticipated decision of the Arkansas Supreme Court. The ruling was that the state's education finance system was unconstitutional and that state legislators had until January 1, 2004 to create an adequate and equitable funding system. This was the first time in the history of Arkansas school funding that the term "adequacy" was used by the courts to describe the Arkansas school funding system.

In the 2003 legislative session, lawmakers contracted with school finance experts Picus and Odden to conduct an adequacy study for the state of Arkansas. The recommendations of the pair included $850 million in additional educational funding, which was a 48% increase in the Arkansas education budget (Summers, Barnett, Ritter, & Greer, 2004).

In a special session in December 2003 Arkansas lawmakers passed a school funding bill, An Act for the Department of Education—Grants and Aids to Local School

Districts and Special Programs Appropriation for the 2003–2005 Biennium (R. Harder, personal communication, April 11, 2010). The passage of this law came from the recommendations of Odden and Picus (2003) on how to fund P-12 education. For the first time in Arkansas public school funding history, three categorical funds were allocated for at-risk students with special needs. Among these categorical funds was the National School Lunch Act (NSLA). Even though the title references the National School Lunch Act, it is a state categorical fund. The name is because the amounts of funding are based on free and reduced lunch percentages as set forth by the federal government.

NSLA Funds Law

The intent behind this Act was to provide additional funds to districts with higher percentages of free or reduced-cost students (Odden et al., 2006). The portion of the act related to NSLA funds was as follows:

Funding for national school lunch students shall be based on the percentage determined under § 6-20-2303(12)(A) multiplied by the number of the previous school year's enrolled students. The State Board of Education shall establish by rule a list of approved programs and purposes for which funds allocated under this subdivision (b)(4) may be expended. School districts shall expend funds allocated under this subdivision (b)(4) only on the approved programs or purposes, which include, but are not limited to: (a) Classroom teachers, provided that the school district meets the minimum salary schedule in § 6-17-2403 without using funds provided under subdivision (b)(4) of this section and those teachers are used for the purposes delineated in subdivision (b)(4) of this section; (b) Before-school academic programs and after- school academic programs, including transportation

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to and from the programs; (c) Prekindergarten programs coordinated by the Department of Human Services; (d) Tutors, teachers' aides, counselors, social workers, nurses, and curriculum specialists; (e) Parent education; (f) Summer programs; (g) Early intervention programs; and (h) Materials, supplies, and equipment, including technology used in approved programs or for approved purposes. (ii) However, notwithstanding any other provision of law, if the Department of Education determines that a school district's expenditure of funds allocated under this subdivision (b)(4) would result in the school district losing funding under any federal law, then the funds allocated to a school district under this subdivision (b)(4) may be expended for other academic programs or salaries. (iii) The department may direct that a school district expend available funds on specified programs under subdivision (b)(4)(C)(i) of this section. (D) By the end of each school year, each school district shall submit to the department a report listing each program upon which funds allocated under this subdivision (b)(4) were expended, the amount expended, and any other information required by the department. The department shall develop appropriate reporting forms for use by school districts came from An Act for the Department of Education—Grants and Aids to Local School Districts and Special Programs Appropriation for the 2003–2005 Biennium (R. Harder, personal communication, April 11, 2010).

The law also included the following levels of funding, for the 2004–2005 school year and each school year thereafter, national school lunch student funding for each identified national school lunch student shall be in three funding levels. First, for school districts in which 90% or greater of the previous school year's enrolled students are

national school lunch students, funding shall be $1,440. Second, for school districts in which at least 70% but less than 90% of the previous school year's enrolled students are national school lunch students, funding shall be $960. Third, for school districts in which less than 70% of the previous school year's enrolled students are national school lunch students, funding shall be $480 (R. Harder, personal communication, April 11, 2010).

This level of funding per student was in effect until the 2007–2008 school year, when the amounts were increased. During this year, funding level 1 districts received $496 for every free or reduced-cost student, funding level 2 districts received $992 for every free or reduced-cost student, and funding level 3 districts received $1,488 for every free or reduced-cost student.

Adequacy in public school funding was not based on a one-time measure in 2003. Part of the ruling of the Supreme Court was that the members of the Arkansas General Assembly had to revisit adequacy before each legislative session. During the interim, a committee of lawmakers gathered data and held hearings to gather testimony and formulate recommendations regarding adequate funding levels for P-12 during the next legislative session. For the past three fiscal years, Arkansas legislators have budgeted between 154 and 162 million in NSLA funds each year to be distributed to school districts (T. Moore, personal communication, November 18, 2010). Given the significant amount of money being appropriated into NSLA funds each year, it is not surprising that the adequacy hearings have also become a forum for looking at how much of the NSLA funds district administrators are carrying over each year and how district administrators are spending the money. Lawmakers want to know if the money appropriated is effective at raising student achievement. Since the inception of NSLA funds, changes have been

made over the years to NSLA rules and regulations. The latest change came in the spring of 2010, and possibly, some of the changes were made based on data received during the adequacy hearings.

Conclusions

Even though educators, researchers, and policy makers have had different opinions and reached different conclusions about the effects of additional funding for students of poverty, the majority of current researchers have supported the argument that additional funding is positively related to student achievement. Since NSLA funds are unique to the state of Arkansas and are recent additions to the state funding formula, it is not known if these funds have led to specific effects on student achievement. The goal in this study was to help clarify the use and effects of these funds.

CHAPTER III

METHODOLOGY

Federal funding intended for students of poverty dates back to the passage of the

Elementary and Secondary Education Act of 1965 and the founding of Title I funds

(North Carolina Department of Education, 2008). The idea of poverty-based funding in

the U.S. thus has origins dating back almost a half of a century; however, the Arkansas

state funding program known as National School Lunch Act (NSLA) has only been in

existence for about seven years. Odden and Picus (2003), consultants to the Arkansas

General Assembly and authors of the *Adequacy Study*, acknowledged the need for

supplemental funds to assist school administrators with the needs of poverty students as a

means to provide adequacy in education.

The researcher's position as a school superintendent in the state of Arkansas leads

to many opportunities to meet many other educators and school administrators. In those

encounters, most of the individuals consulted have agreed with the recommendations of

Odden and Picus (2003); however, the researcher's experiences attending adequacy

hearings in April of 2008 and April of 2010 were that certain legislators and political

groups have doubts about NSLA funds for specific reasons. Some legislators and

members of special interest groups believe that the state should do away with NSLA

funds completely. Other groups differ in their views about how district administrators

should be allowed to spend NSLA funds, and/or the amount of NSLA funds that district administrators are carrying over each year (Reeve, 2010).

This chapter includes a description of how the study was designed. The chapter is divided into six sections: research design, sample, instrument, data collection procedures, analytical methods, and limitations.

Research Design

There were two goals in this study. The first was to determine the effect of four NSLA levels on students' literacy and math achievement for grades four, six, and eight in Arkansas public schools. The second was to examine the allocation of expenditures across 11 spending categories by the four NSLA levels to determine if any spending patterns existed, and if so, the most effective spending patterns.

The study was designed as a non-experimental causal comparative study. According to Johnson and Christensen (2008), these methods are appropriate for studies in which the focus is "on the collection of quantitative data, i.e. numerical data" (p. 33) and "there is no manipulation of an independent variable and no random assignment to groups by the researcher" (p. 43). The independent variable in the study was NSLA funding levels. This variable fits Johnson and Christensen's definition because there was no manipulation of the variable by the researcher and there was no assignment to groups. The dependent variables in the study were students' achievement in literacy and math.

Sample

This causal-comparative study involved two samples. The sample for the first research question comprised 720 students. Data for this sample were collected from the population of students in grades four, six, and eight who took the Arkansas Benchmark

Exams in 244 public school districts during the 2008–2009 school year. A stratified random selection process was used to draw this sample.

The sampling frame for the hypothese and the research question was a Microsoft Excel 2007 spreadsheet obtained from the ADE containing the free or reduced-cost lunch percentages of all 244 public school districts in the state of Arkansas. It also included a Microsoft Excel 2007 spreadsheet containing student achievement data in literacy and mathematics obtained from the National Office for Research on Measurement and Evaluation Systems (NORMES).

First, all 244 districts were organized into their NSLA level on the Microsoft Excel 2007 spreadsheet. There are three levels of NSLA funding. Level 1 includes all districts up to 69% free or reduced-cost lunch count, Level 2 includes districts from 70% to 89% free or reduced-cost lunch count, and Level 3 includes districts at 90% to 100% free or reduced-cost lunch count (ADE, 2009b). Level 1, which includes all districts up to 69% free or reduced-cost lunch count, was further divided into two groups. The first group included all districts with up to 49% free or reduced-cost lunch count, and the second group included districts with 50% to 69% free or reduced-cost lunch count. The motivation behind dividing Level 1 into two groups was the large number of districts in Level 1 and the large disparity between the districts in the Level 1 category. Of the 244 school districts in Arkansas, 173 districts fall into the Level 1 category of NSLA funding. The district with the lowest free or reduced-cost lunch count is 21%, and it was projected that such districts might be very different from those that are nearer to the 69% cut-off for Level 1.

Dividing the first level into two groups brought the total number of NSLA levels to four. Districts in each category were placed in alphabetical order and a unique number was assigned to each district. Two districts from each funding category were chosen from each of the four groups by using random numbers generated in Microsoft Excel 2007. The random number list was matched with the unique number for each of the school districts to determine which districts would be investigated. Only two districts were chosen from each level due to the small number of districts that are in NSLA level 4. Selecting equal numbers of districts from each group was important to maintain the validity of the study (Johnson & Christensen, 2008).

After choosing the two districts from each of the four funding levels (for a total of eight districts), 30 students from each of those districts were randomly selected from the Microsoft Excel 2007 spreadsheet of the NORMES data in each of the three grade levels, grades 4, 6, and 8, bringing the sample size for the first research question to 720. Students from each district chosen in each category were assigned a unique number. In Table 1, the student demographic information for this sample is presented.

Table 1

Student Demographic Information by Grade and NSLA Level

	Minority (%)	Free or Reduced Lunch (%)	Limited English Proficiency (%)	Male/Female (%)
NSLA Level 1				
Grade 4	0	38	0	48/52
Grade 6	0	37	0	52/48
Grade 8	7	42	0	55/45
NSLA Level 2				
Grade 4	30	77	8	45/55
Grade 6	22	53	5	62/38
Grade 8	23	57	3	42/58
NSLA Level 3				
Grade 4	22	78	8	42/58
Grade 6	30	93	13	57/43
Grade 8	25	83	7	53/47
NSLA Level 4				
Grade 4	90	98	2	53/47
Grade 6	97	97	2	45/55
Grade 8	97	95	2	55/45

For the research question, a convenience sample of 24 districts was selected from the 244 school districts in Arkansas. Six districts were selected from each of the four NSLA levels. The size of the overall sample was limited by the fact there are only six districts in NSLA Level 4. Because of this, a convenience sample comprising all the

districts in this level was chosen. Using the same Microsoft Excel 2007 spreadsheet, six

districts each were randomly chosen from schools in the remaining NSLA levels.

Demographic information for the districts chosen for the second research question is

summarized in Table 2.

Table 2

Demographics for Districts Chosen for the Second Phase of Research by NSLA level

District	Level 1		Level 2		Level 3		Level 4	
	FR (%)	Min (%)	FR (%)	Min (%)	FR (%)	Min (%)	FR (%)	Min (%)
1	48	3	56	33	73	3	94	92
2	42	9	57	10	76	98	95	96
3	43	1	55	1	73	5	94	93
4	49	4	69	43	72	2	91	96
5	47	5	52	13	75	60	96	92
6	41	6	65	34	72	37	93	94

Note. FR = Free or Reduced-cost Lunch; Min = Minority

Instrumentation

The ACTAAP is the foundation for all testing and accountability in the state of

Arkansas. Specifically, the AABE was used to measure the literacy and math

achievement in addressing the first research question. Two components comprise the tests

for grades 3–8: a criterion-referenced test (CRT) and a norm-referenced test (NRT). The

CRT component is focused on establishing student performance levels and contains items

specifically designed to align with Arkansas state education standards. The literacy and

math performance levels, determined by the 2009 AABE, were used to identify students

who were proficient or above, which is considered to be at grade level. Permission to use the data was granted by the district superintendents of the schools in the study.

The members of the ADE (2009a) determined the AABE to be both reliable and valid. Researchers at the ADE reported that the AABE have "technically sound levels of reliability, validity, and fairness, based on the extensive research that underlies both the CRT and NRT item sets" (p. 6). The AABE are developed around a common design from year to year (Pearson, 2009). Although the test forms are built around a common design, post-equating is used to control varying levels of difficulty from one version of the test to the next. The Technical Advisory Committee (TAC) noted that these equating methods are empirical procedures for establishing uniformity between raw scores on different test forms.

Linking items are used to connect one test version to another test version of the AABE (Pearson, 2009). Evaluators use the connection items to place test items on the same scale as the previous year with a common-item, non-equivalent groups-linking strategy. From this linking strategy, parameters are established to ensure consistency between different forms of the test. Accuracy rates were .89 or above for all grades in both literacy and mathematics.

According to the technical report, "The approach approved by the TAC is the Stratified Alpha method. In this approach, reliability for each item type is estimated separately for reliability and then combined with other item types' reliabilities to yield a more accurate estimate of the overall reliability" (Pearson, 2009, p. 59).

The outcomes of these assessments are used to determine adequate yearly progress as mandated in the No Child Left Behind Act. Students in grades three through

eight are given approximately two and a half hours daily to complete the four-day test. The test items in both literacy and math include multiple choice and open response questions. The four levels of student achievement on these criterion-referenced exams include advanced, proficient, basic, and below basic. The staff of the ADE (2009a) defined the student levels of achievement as follows:

Advanced: Students demonstrate superior performance well beyond proficient grade-level performance. They can apply established reading, writing, and mathematics skills to solve complex problems and complete demanding tasks on their own. They can make insightful connections between abstract and concrete ideas and provide well-supported explanations and arguments.

Proficient: Students demonstrate solid academic performance for the grade tested and are well prepared for the next level of schooling. They can use established reading, writing, and mathematics skills and knowledge to solve problems and complete tasks on their own. Students can tie ideas together and explain the ways their ideas are connected.

Basic: Students show substantial skills in reading, writing, and mathematics; however, they only partially, demonstrate the abilities to apply these skills.

Below Basic: Students fail to show sufficient mastering of skills in reading, writing, and mathematics to attain the basic level. (para. 15)

"Each performance category has a range of specific scale scores by grade level in both mathematics and literacy that corresponds to a particular performance level. These scale scores may be utilized to demonstrate academic growth when comparing scale scores from one year to the next" (Pearson, 2009, p. 57).

Data Collection Procedures

After approval was obtained from the Institutional Review Board (IRB), each of the two districts from the four funding levels were chosen and student scaled scores for literacy and math for spring 2009 administration of the AABE were collected. Permission was obtained from the superintendents of each of the eight school districts to use their students' data. Superintendents were sent an e-mail with a letter attached explaining the study and requesting permission for use of the data. Electronic replies to the request were used as documentation of permission granted. Each district is given a unique user name and password to access the scores of their students on the NORMES website. Districts that were chosen and agreed to participate in the study exported student data by grade level for grades 4, 6, and 8 in Microsoft Excel 2007 spreadsheets and sent the data electronically. All data will be kept in a secure environment for one year by the researcher. Identities of school districts and individual students are unidentifiable in the data.

For the second research question, data for each of the selected district's NSLA expenditures for the 2008–2009 school year were obtained from APSCN reports located on the ADE website. In compliance with § 6-20-2201, Educational Financial Accounting and Reporting Act of 2004, the ADE Financial Accounting Handbook includes valid comparisons of school district expenditures; however, interpretation of the coding may differ between school business officials in various districts. All six districts within the same NSLA funding level are grouped together to report expenditures so individual districts are unidentifiable and anonymous.

Analytical Methods

Data were entered into the Statistical Package for Social Science (SPSS) software, version 19. Before running statistical tests, data were examined and checked to ensure accuracy and to verify that the assumptions were met for the test of significance (Sirkin, 2006). To test the hypotheses, one-way analyses of variance (ANOVAs) were conducted to test for effects of the independent variable on the four NSLA funding levels on literacy and math achievement. Assumptions for conducting ANOVAs that include normal distribution and homogeneity of variances were checked. According to Sirkin (2006), "ANOVA can be used to compare more than two means and is very versatile" (p. 318).

For the second research question, descriptive statistics were used to summarize and examine NSLA expenditures across the different district funding categories. According to Johnson and Christensen (2008), "descriptive statistics focuses on describing, summarizing, or explaining data" (p. 585). The results of the analysis were then presented in charts. Using the year-end expenditure reports from the ADE, expenditures from each of the categories were calculated to represent a percentage of the total NSLA expenditures for that NSLA level.

Limitations

Almost all non-experimental research projects involve challenges that are out of the control of the researcher (Johnson & Christensen, 2008). For this particular project, a major limitation to the study was the inability to hold other variables constant that could have an effect on student achievement. The ability to pinpoint exactly what effect new programs, changing instructional strategies, changes in personnel, and so forth may have on student achievement is almost impossible in non-experimental studies. New strategies

and programs may have been implemented to target achievement in areas measurable by the dependent variable, but the cost may have been paid from other funding sources besides the NSLA funds.

Another limitation to the study is problems that occur with data obtained from the NSLA expenditure reports from the ADE website. Reports on the website are obtained from school districts' APSCN data. Information obtained from the APSCN program is based on data reported by personnel from the districts. Although uniform codes are in place, each district may code expenditures a little differently; therefore, uniformity may be an issue when compiling the data. Some expenditure codes are very closely related. Personnel in one district may code a specific expenditure into one category that personnel in another district code to a different category. An additional issue with the data is that the analysis of the expenditures may not be specific enough to lead to conclusions that can be helpful for district administrators.

Sample size may also constitute a limitation in addressing the second research question, since 24 out of 244 districts is a relatively small sample. The fact that this study was limited to the state of Arkansas is also a limitation to generalizing these results to schools in other states, given that each state's public school funding system is different.

CHAPTER IV

RESULTS

The purpose in this quantitative study was to examine differences in students'

math and literacy achievement scores for grades four, six, and eight, and to examine the

allocation of districts' NSLA expenditures. These issues were analyzed in relation to four

different NSLA levels representing the percentage of free and reduced-cost lunches in the

districts. The independent variable was NSLA level. The dependent variables were

literacy and math achievement scores measured by the state's Augmented Benchmark

Examinations for grades four, six, and eight. One-way Analyses of Variance (ANOVAs)

were run to test at each of six hypotheses in relation to the first research question. This

chapter provides a summary of the statistical analysis.

Demographic Information

Demographic information was collected on the 720 students chosen from the

eight school districts in relation to the first research question. Data reported included the

percent of minority students, free or reduced-cost lunch percentages, limited English

proficiency (LEP) percentages, and the female/male percentages. The information

provided was the percentages of the students from the sample for the NSLA level, not the

overall percentages of the districts' students. The demographic information is presented

in Table 1 (Chapter 3).

For the second research question, demographics were gathered on six school districts from the four NSLA levels (a total to 24 districts). Free or reduced-cost percentages and minority percentages for the districts were reported. Demographics for each of the six districts in the four NSLA levels are presented in Table 2 (Chapter 3).

Statistical Assumptions

All analyses for this study were conducted using SPSS (IBM Statistical Premium GradPak 19). The statistical assumptions of normality and homogeneity of variances were checked prior to running each analysis. This included checks for skew, kurtosis, a visual inspection of the box and whisker plots, and Kolmogrov-Smirnov statistics. Levene test was used to test for homogeneity of variances among the groups. Finally, for each analysis, post-hoc tests were conducted as necessary to determine the nature of the differences between the groups.

Hypothesis 1

Hypothesis 1 stated that no significant differences would exist among the four NSLA levels in relation to students' literacy achievement scores for grade four on the Arkansas Augmented Benchmark Examination. The means and standard deviations for the different NSLA levels for the fourth grade 2009-benchmark examinations are summarized in Table 3.

Table 3

Descriptive Statistics for 2009 Arkansas Augmented Benchmark Literacy Scale Scores for Fourth-Grade Students, by NSLA Level

Group	*M*	*SD*
NSLA Level 1	714.33	126.793
NSLA Level 2	624.27	144.796
NSLA Level 3	668.82	135.340
NSLA Level 4	567.07	151.180

To test this hypothesis, the data were screened for outliers and tested for normality as well as homogeneity of variances. In an examination of the box and whisker plots, a few negative outliers were revealed. Because these outliers were few and non-significant, no adjustment was made to the data (Mertler & Vannatta, 2010). Kolmogorov-Smirnov statistics indicated that the normality assumption was met. The Kolmogorov-Smirnov test of normality with the Lilliefors significance correction indicated that the null hypothesis for non-normal distribution could be rejected for all NSLA levels ($p > .05$). Finally, Levene's test of equality of variances was performed to test for homogeneity of variances and indicated no violations of the assumption: F $(3,236) = .816, p > .05$.

With all the assumptions met, a one-way ANOVA was conducted using NSLA level as the independent variable and the 2009 Arkansas Augmented Benchmark Examination Literacy Scale Scores for fourth grade as the dependent variable. There was sufficient evidence to reject the null hypothesis: $F (3, 236) = 10.796, p = .000, \eta^2 = .121$ as summarized in Table 4. Because the omnibus test was statistically significant,

Bonferroni post-hoc tests were performed to determine the nature of the difference

between the means.

Table 4

One-Way ANOVA for 2009 Arkansas Augmented Benchmark Examination Literacy Scale

Scores (Fourth Grade)

Source	SS	df	MS	F	Sig.
Between Groups	633179.213	3	211059.738	10.796	.000
Within Groups	4613555.783	236	19548.965		
Total	5246734.996	239			

The literacy performance of students in Level 1 schools was significantly

different from that at Level 2 schools ($p = .003$) and Level 4 schools ($p = .000$). There

also was a significant difference between the literacy performance of students at Level 3

schools and those at Level 4 schools ($p = .002$).

Hypothesis 2

Hypothesis 2 was that no significant differences would exist among the four

NSLA levels concerning students' literacy achievement scores for grade six on the

Arkansas Augmented Benchmark Examination. Table 5 is a summary of the means and

standard deviations for the NSLA levels for the sixth grade 2009-benchmark

examinations.

Table 5

Descriptive Statistics for 2009 Arkansas Augmented Benchmark Literacy Scale Scores for

Sixth-Grade Students, by NSLA Level

Group	*M*	*SD*
NSLA Level 1	816.48	13.530
NSLA Level 2	690.97	20.934
NSLA Level 3	725.82	18.125
NSLA Level 4	573.58	20.426

To test this hypothesis, the data were screened for outliers and tested for
normality as well as homogeneity of variances. An examination of the box and whisker
plots indicated no significant outliers. Kolmogorov-Smirnov statistics indicated that the
normality could not be assumed for any of the levels with the exception of Level 1. Due
to the large and equal sample size across the groups, the normality assumption was
relaxed (Sirkin, 2006). Finally, Levene's test indicated that homogeneity variances across
the four NSLA levels could not be assumed for this analysis. To adjust for this, the
Brown Forsythe robust test of equality of means was conducted and interpreted in place
of the regular ANOVA *F* statistic (Field, 2009).

A one-way ANOVA was conducted using NSLA level as the independent
variable and the 2009 Arkansas Augmented Benchmark Examination Literacy Scale
Scores for sixth grade as the dependent variable. There was sufficient evidence to reject
the null hypothesis: $F(3, 236) = 29.540$, $p = .000$, $\eta^2 = .273$ as summarized in Table 6.
Because the omnibus test was statistically significant, the Games Howell post-hoc test

was performed to determine the nature of the difference between the means since normality assumptions had not been met.

Table 6

One-Way ANOVA for 2009 Arkansas Augmented Benchmark Examination Literacy Scale Scores (Sixth Grade)

Source	*SS*	*df*	*MS*	*F*	*Sig.*
Between Groups	1817154.679	3	605718.226	29.540	.000
Within Groups	4839246.483	236	20505.282		
Total	6656401.163	239			

The literacy performance of students in Level 1 schools was significantly different from all other NSLA Level schools (*p* = .000, p = .001, *p* = .000). There was also a significant difference in the literacy performance of students in Level 2 schools versus Level 4 schools (*p* = .001), and in Level 3 schools versus Level 4 schools (*p* = .000).

Hypothesis 3

Hypothesis 3 was that no significant differences would exist among the four NSLA levels concerning students' literacy achievement scores for grade eight on the Arkansas Augmented Benchmark Examination. In Table 7, data are presented for the means and standard deviations for the different NSLA levels for the eighth grade 2009-benchmark examinations.

Table 7

Descriptive Statistics for 2009 Arkansas Augmented Benchmark Literacy Scale Scores for

Eighth-Grade Students, by NSLA Level

Group	*M*	*SD*
NSLA Level 1	840.87	15.104
NSLA Level 2	812.30	20.208
NSLA Level 3	754.70	21.487
NSLA Level 4	653.73	18.029

To test this null hypothesis, the data were screened for outliers and tested for normality as well as homogeneity of variances. An examination of the box and whisker plots indicated a few outliers. Because these outliers were few and non-significant, no adjustment was made to the data (Mertler & Vannatta, 2010). Kolmogorov-Smirnov statistics indicated that the normality assumption was not met. Kolmogorov-Smirnov test of normality with the Lilliefors significance correction indicated that only one NSLA level was at the accepted ($p > .05$) for literacy scores; however, the normality assumption was relaxed because "ANOVA is not heavily dependent upon fulfilling the normality assumption as long as group sample sizes are adequate" (p. 81). Finally, Levene's test of equality of variances was performed to test for homogeneity of variances and indicated no violations of the assumption: $F (3, 236) = .122, p > .05$.

With all the assumptions met, a one-way ANOVA was conducted using NSLA level as the independent variable and the 2009 Arkansas Augmented Benchmark Examination Literacy Scale Scores for eighth grade as the dependent variable. There was sufficient evidence to reject the null hypothesis: $F (3, 236) = 19.186, p = .000, \eta^2 = .196$

as summarized in Table 8. Because the omnibus test was statistically significant,

Bonferroni post-hoc tests were performed to examine the nature of the difference

between the means.

Table 8

One-Way ANOVA for 2009 Arkansas Augmented Benchmark Examination Literacy Scale

Scores (Eighth Grade)

Source	SS	*Df*	MS	*F*	Sig.
Between Groups	1228725.733	3	409575.244	19.186	.000
Within Groups	5038153.867	236	21348.110		
Total	6266879.600	239			

The literacy performance of students in Level 1 schools was significantly

different from that at Level 3 schools ($p = .008$) and at Level 4 schools ($p = .000$). There

also was a significant difference between the literacy performance of students at Level 2

schools versus Level 4 schools ($p = .002$) and at Level 3 schools versus Level 4 schools

($p = .001$).

Hypothesis 4

Hypothesis 4 was that no significant differences would exist among the four

NSLA levels about students' math achievement scores for grade four on the Arkansas

Augmented Benchmark Examination. In Table 9, data are presented for the means and

standard deviations for the different NSLA levels for the fourth-grade 2009-benchmark

examinations.

Table 9

Descriptive Statistics for 2009 Arkansas Augmented Benchmark Math Scale Scores for

Fourth-Grade Students, by NSLA Level

Group	M	SD
NSLA Level 1	674.33	9.546
NSLA Level 2	655.37	10.362
NSLA Level 3	643.67	9.960
NSLA Level 4	592.02	9.685

To test this hypothesis, the data were screened for outliers and tested for normality as well as homogeneity of variances. An examination of the box and whisker plots indicated a few outliers. Because these outliers were few and non-significant, no adjustment was made to the data (Mertler & Vannatta, 2010). Kolmogorov-Smirnov statistics indicated that the normality assumption was met. Kolmogorov-Smirnov test of normality with the Lilliefors significance correction indicated that the null hypothesis for non-normal distribution could be rejected for all NSLA levels ($p > .05$). Finally, Levene's test of equality of variances was performed to test for homogeneity of variances and indicated no violations of the assumption: $F (3, 236) = .884, p > .05$.

With all the assumptions met, a one-way ANOVA was conducted using NSLA level as the independent variable and the 2009 Arkansas Augmented Benchmark Examination Math Scale Scores for fourth grade as the dependent variable. There was sufficient evidence to reject the first null hypothesis: $F (3, 236) = 12.681, p = .000, \eta^2 = .139$ as summarized in Table 10. Because the omnibus test was statistically significant,

Bonferroni post-hoc tests were performed to determine the nature of the difference between the means.

Table 10

One-Way ANOVA for 2009 Arkansas Augmented Benchmark Examination Math Scale Scores (Fourth Grade)

Source	SS	df	MS	F	Sig.
Between Groups	223410.713	3	74470.238	12.681	.000
Within Groups	1385913.583	236	5872.515		
Total	1609324.296	239			

The math performance of students in Level 1 schools was significantly different from that at Level 4 schools (p = .000), the math performance at Level 2 schools was significantly different from that at Level 4 schools (p = .000), and the math performance at Level 3 schools was significantly different from that at Level 4 schools (p = .002).

Hypothesis 5

Hypothesis 5 was that no significant differences would exist among the four NSLA levels concerning students' math achievement scores for grade six on the Arkansas Augmented Benchmark Examination. The means and standard deviations for the different NSLA levels for the sixth grade 2009-benchmark examinations are summarized in Table 11.

Table 11

Descriptive Statistics for 2009 Arkansas Augmented Benchmark Math Scale Scores for

Sixth-Grade Students, by NSLA Level

Group	*M*	*SD*
NSLA Level 1	796.15	10.544
NSLA Level 2	730.68	11.743
NSLA Level 3	707.50	10.740
NSLA Level 4	667.32	11.370

To test this hypothesis, the data were screened for outliers and tested for normality as well as homogeneity of variances. An examination of the box and whisker plots indicated a few outliers. Because these outliers were few and non-significant, no adjustment was made to the data (Mertler & Vannatta, 2010). Kolmogorov-Smirnov statistics indicated that the normality assumption was not met. Kolmogorov-Smirnov test of normality with the Lilliefors significance correction indicated that all NSLA levels were at the accepted ($p > .05$) except for NSLA Level 3 for math scores; however, the normality assumption was relaxed because "ANOVA is not heavily dependent upon fulfilling the normality assumption as long as group sample sizes are adequate" (Mertler et al., 2010, p. 81). Finally, Levene's test of equality of variances was performed to test for homogeneity of variances and indicated no violations of the assumption: $F(3, 236) = .573$, $p > .05$. There was sufficient evidence to reject the null hypothesis for non-normal distribution for all NSLA levels.

With all the assumptions met, a one-way ANOVA was conducted using NSLA level as the independent variable and the 2009 Arkansas Augmented Benchmark

Examination Math Scale Scores for sixth grade as the dependent variable. There was sufficient evidence to reject the null hypothesis: $F(3, 236) = 23.570$, $p = .000$, $\eta^2 = .231$ as summarized in Table 12. Because the omnibus test was statistically significant, Bonferroni post-hoc tests were performed to determine the nature of the difference between the means.

Table 12

One-Way ANOVA for 2009 Arkansas Augmented Benchmark Examination Math Scale Scores (Sixth Grade)

Source	SS	df	MS	F	Sig.
Between Groups	523653.546	3	174551.182	23.570	.000
Within Groups	1747760.617	236	7405.765		
Total	2271414.162	239			

The math performance of students in Level 1 schools was significantly different from all other NSLA levels ($p = .000$). There was also a significant difference between Level 2 schools and Level 4 schools ($p = .000$).

Hypothesis 6

Hypothesis 6 was that no significant differences would exist by the four NSLA levels on students' math achievement scores for grade eight on the Arkansas Augmented Benchmark Examination. In Table 13, data are presented for the means and standard deviations for the different NSLA levels for the eighth grade 2009-benchmark examinations.

Table 13

Descriptive Statistics for 2009 Arkansas Augmented Benchmark Math Scale Scores for

Eighth-Grade Students, by NSLA Level

Group	*M*	*SD*
NSLA Level 1	736.87	9.256
NSLA Level 2	753.52	12.287
NSLA Level 3	700.00	10.082
NSLA Level 4	643.30	12.024

To test this hypothesis, the data were screened for outliers and tested for normality as well as homogeneity of variances. An examination of the box and whisker plots indicated few outliers. Because these outliers were few and non-significant, no adjustment was made to the data (Mertler & Vannatta, 2010). Kolmogorov-Smirnov statistics indicated that the normality assumption was not met. Kolmogorov-Smirnov test of normality with the Lilliefors significance correction indicated that all NSLA levels were at the accepted ($p > .05$) except for NSLA Level 4 for math scores; however, the normality assumption was relaxed because "ANOVA is not heavily dependent upon fulfilling the normality assumption as long as group sample sizes are adequate" (p. 81). Finally, Levene's test of equality of variances was performed to test for homogeneity of variances and indicated no violations of the assumption: $F(3, 236) = .055$, $p > .05$. There was sufficient evidence to reject the null hypothesis for non-normal distribution for all NSLA levels.

To test the hypothesis, a one-way ANOVA was conducted using NSLA level as the independent variable and the 2009 Arkansas Augmented Benchmark Examination

Math Scale Scores for eighth grade as the dependent variable. There was sufficient

evidence based on the effect of the variable to reject the first null hypothesis: F (3, 236) =

19.756, p = .000, η^2 = .201 as summarized in Table 14. Because the omnibus test was

statistically significant, Bonferroni post-hoc tests were performed to determine the nature

of the difference between the means.

Table 14

One-Way ANOVA for 2009 Arkansas Augmented Benchmark Examination Math Scale

Scores (Eighth Grade)

Source	SS	df	MS	F	Sig.
Between Groups	429265.979	3	143088.660	19.756	.000
Within Groups	1709292.517	236	7242.765		
Total	2138558.496	239			

The math performance of students in Level 1 schools was significantly different

from Level 4 schools (p = .000). There was also significant differences in Level 2

schools versus Level 3 schools (p = .004) and Level 4 schools (p = .000), and in Level 3

schools versus Level 4 schools (p = .002).

Research Question

The purpose in the second research question was to analyze NSLA expenditures

for the four NSLA levels across 11 spending categories for the 2009–2010 school year to

determine spending patterns, and if so, the most efficient spending patterns. Expenditures

for each of the four NSLA levels in each of the 11 categories were summed for the six

districts in each level and then divided by the total expenditures for the all the districts in that NSLA level to obtain a percentage for that category.

The first category of expenditures was pre-school (pre-K). Pre-K program expenditures could include salaries and benefits, materials and supplies, and purchased services. A summary of pre-school expenditures by NSLA level are presented in Figure 1.
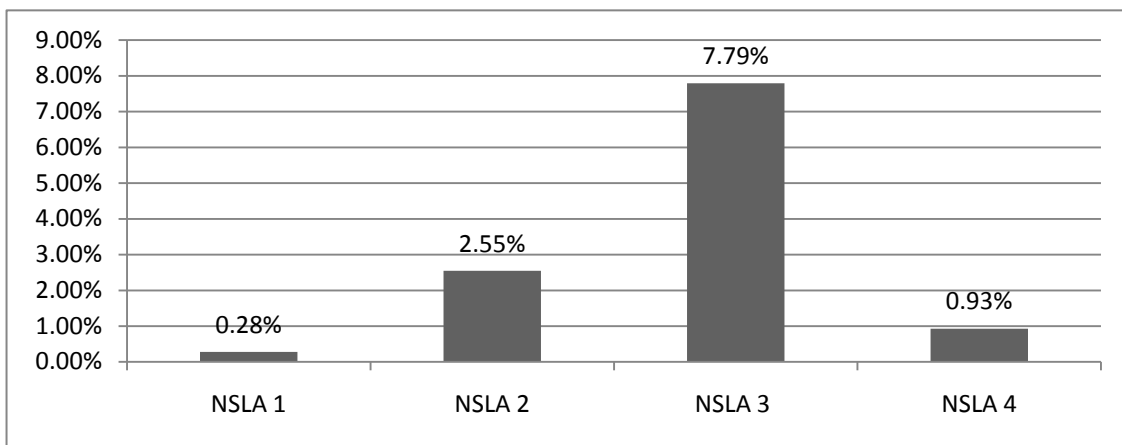

Figure 1. Expenditures for pre-K programs for all NSLA levels.

Category 2 was math, literacy, and science coaches (academic coaches). These positions support classroom teachers in delivering instruction in the respective subject areas. Generally, academic coaches are not assigned students. Expenditures for academic coaches are presented in Figure 2.
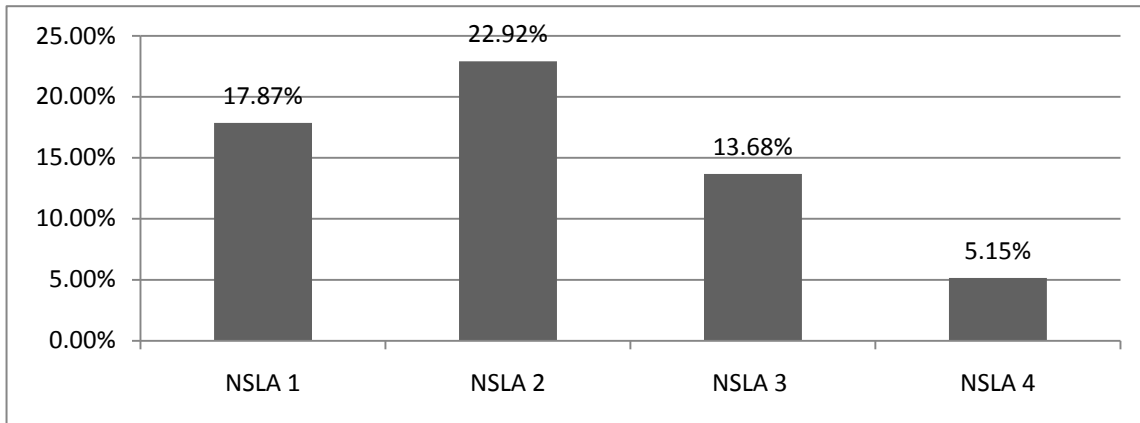
Figure 2. Expenditures for math/literacy/science coaches for all NSLA levels.

Teachers' aides are used in assisting the classroom teacher. The intent is for teachers' aides to be used the majority of time in assisting students with instruction. For the most part teachers' aides are not certified teachers; however, in some instances they could be certified teachers. A summary of the third expenditure category, teachers' aides, is presented in Figure 3.
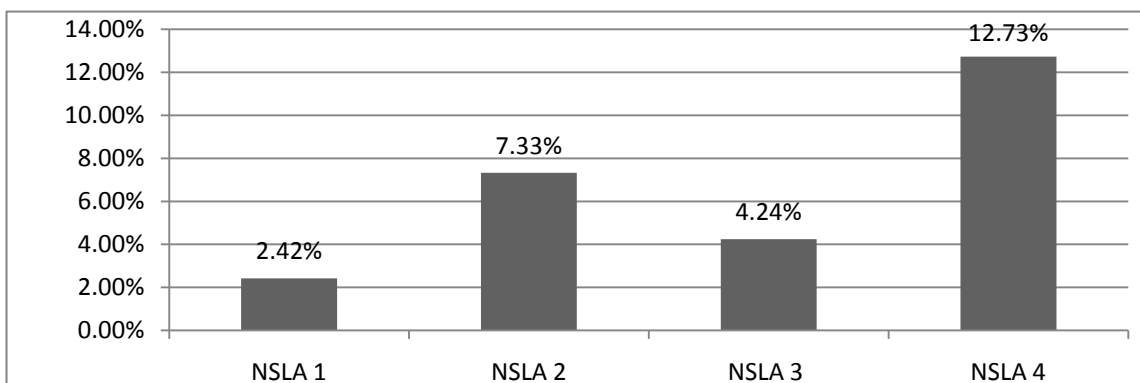

Figure 3. Expenditures for teachers' aides for all NSLA levels.

Category four expenditures included nurses, social workers, and counselors. District administrators may not use NSLA funds to pay for any of the positions that are

required for the district to meet standards for accreditation. NSLA funds may only be used for the positions that are above the minimum requirements. Figure 4 is a summary of the NSLA expenditures for nurses, social workers, and counselors.
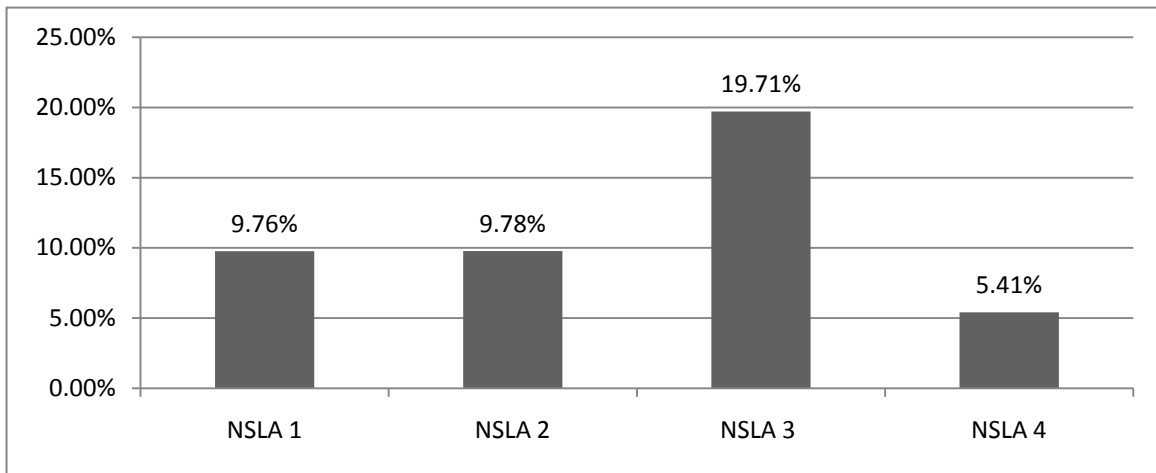

Figure 4. Expenditures for nurses, social workers, and counselors, for all NSLA levels.

Category 5 includes expenditures for before- and after-school programs, summer school, and tutors. The intent in all of these programs is to provide additional instruction and/or remediation to students who are not at grade level. A summary of NSLA expenditures for before- and after-school programs, summer school, and tutors is presented in Figure 5.
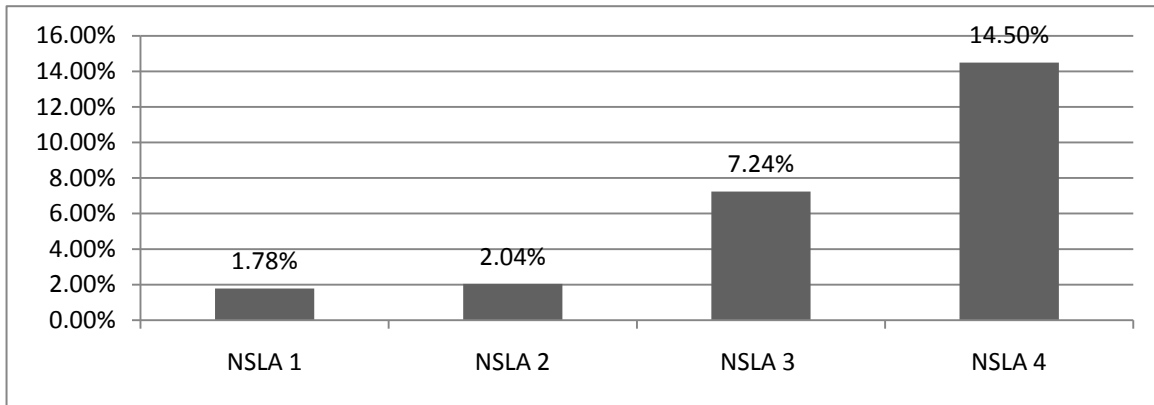
Figure 5. Expenditures for before/after-school programs, summer school, and tutors, for all NSLA levels.

Curriculum specialists comprised the expenditures for category six. Individuals in these positions do not generally work directly with students. The role of the curriculum specialist is to work with building principals and teachers to improve curriculum, instruction, and assessment. Figure 6 is a summary of NSLA expenditures for curriculum specialists.
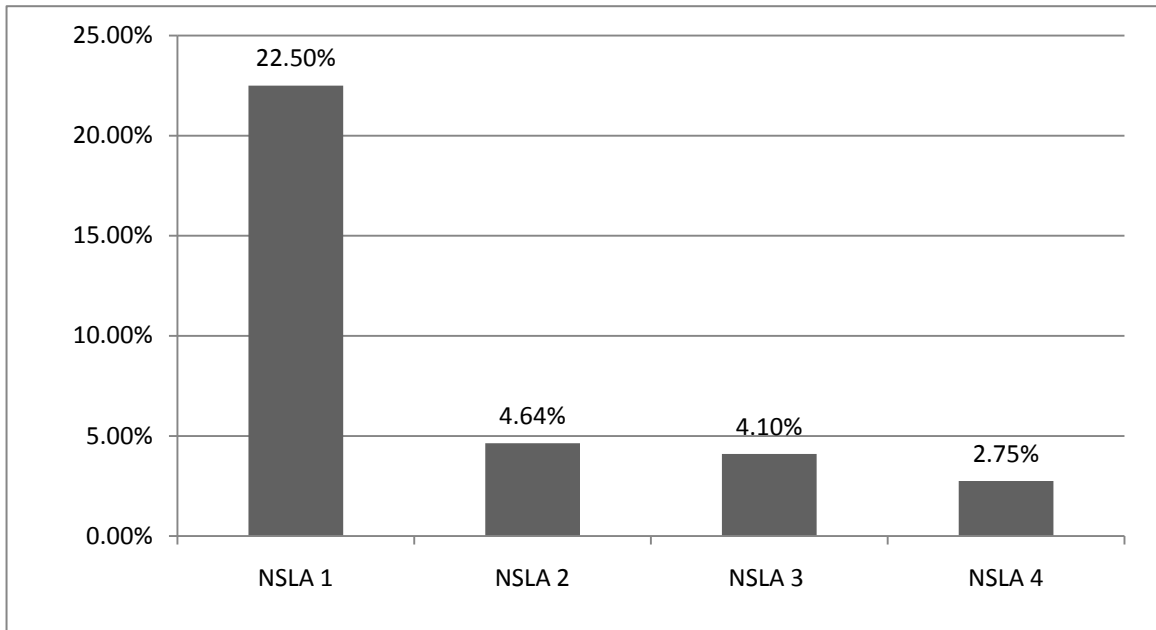
Figure 6. Expenditures for curriculum specialists for all NSLA levels.

Professional development expenditures were the seventh category of NSLA expenditures. Professional development is designed to improve knowledge and skills in order to facilitate improvements for the purpose of increasing student achievement. A summary of professional development NSLA expenditures is summarized in Figure 7.

Figure 7. Expenditures for professional development for all NSLA levels.

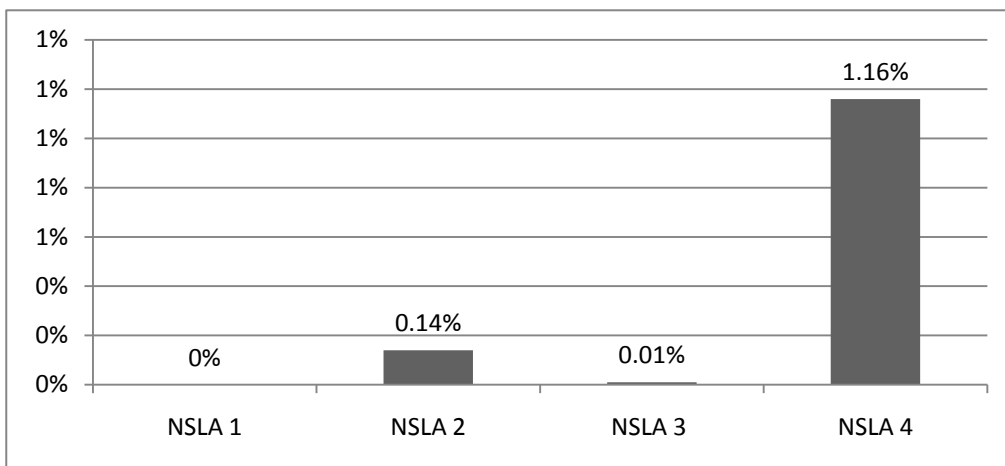Classroom teachers comprised the eighth NSLA expenditure category. NSLA funds cannot be used for teachers' salaries to meet the minimum standards for accreditation. Teachers' salaries above the requirements to meet standards are the only way NSLA funds can be used for this category. An example is hiring additional teachers to reduce class sizes. Classroom teacher expenditures are summarized in Figure 8.
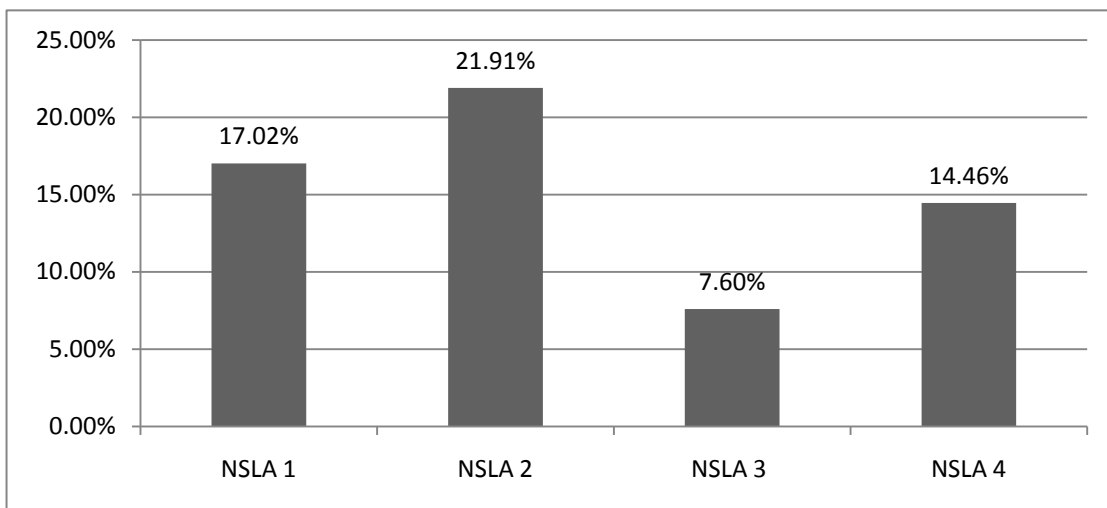
Figure 8. Expenditures for classroom teachers for all NSLA levels.

The ninth category of NSLA expenditures was transfers to categorical funds. Categorical funds are used for English language learners (ELL), professional development, and alternative learning environment (ALE). District administrators may transfer NSLA funds into one of these other categorical funds if approved in the district's Arkansas Comprehensive School Improvement Plan (ACSIP). Figure 9 is a summary of the NSLA expenditures for transfers to categorical funds.
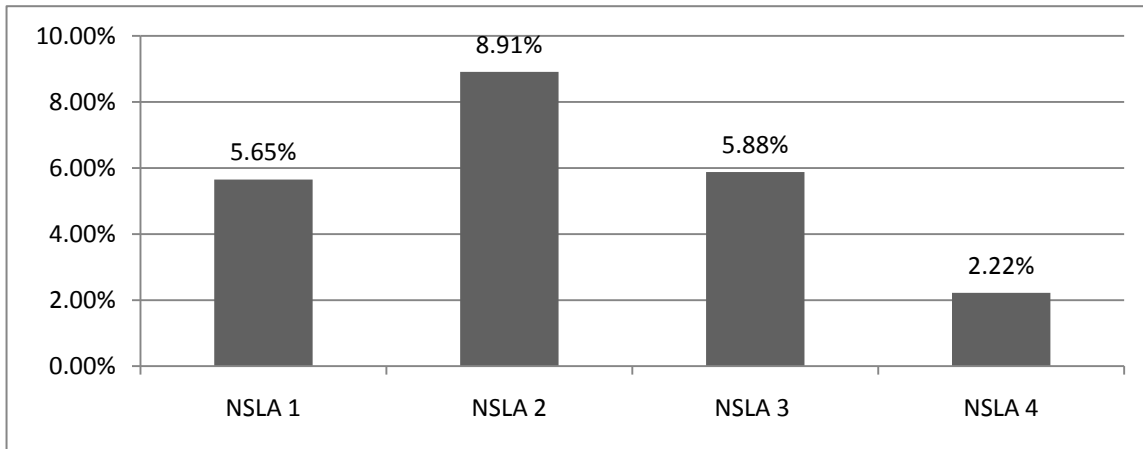
Figure 9. Expenditures for transfers to categorical funds for all NSLA levels.

School improvement planning was the tenth category for NSLA expenditures. Expenditures in this category are related to activities of districts that have been identified as not meeting adequately yearly progress (AYP) based on student achievement. A summary of the NSLA expenditures for school improvement planning are presented in Table 10.

Figure 10. Expenditures for school improvement planning for all NSLA levels.

The eleventh NSLA expenditure category encompassed all other allowable expenditures. Some of these are parent education, early intervention, technology, and any other activity as approved by the ADE. The expenditures in this category are summarized in Figure 11.

Figure 11. Expenditures for all other items, for all NSLA levels.

CHAPTER V

DISCUSSION

The Continuing Adequacy Evaluation Act of 2004 (J. Kunkel, personal communication, April 11, 2010) included provisions for adequacy funding; meani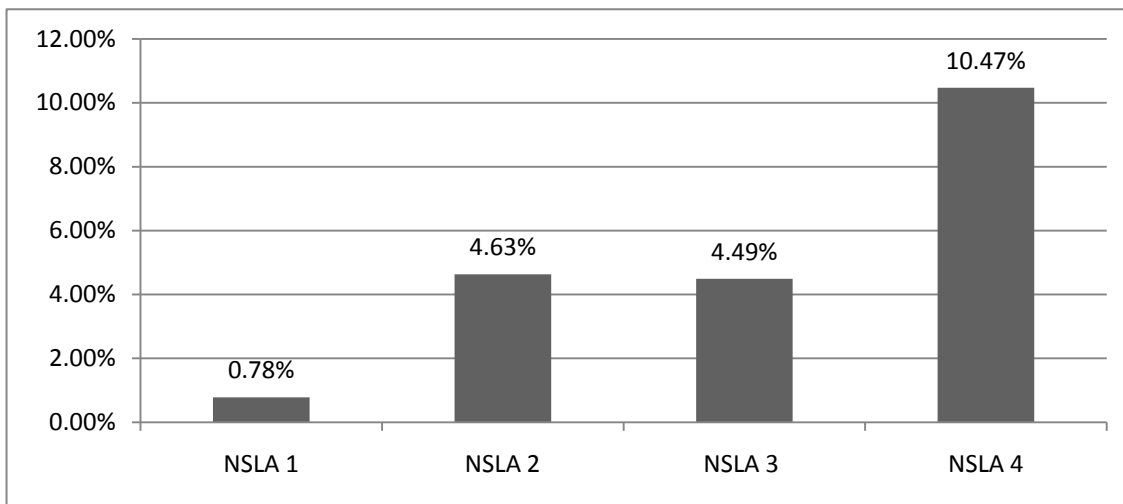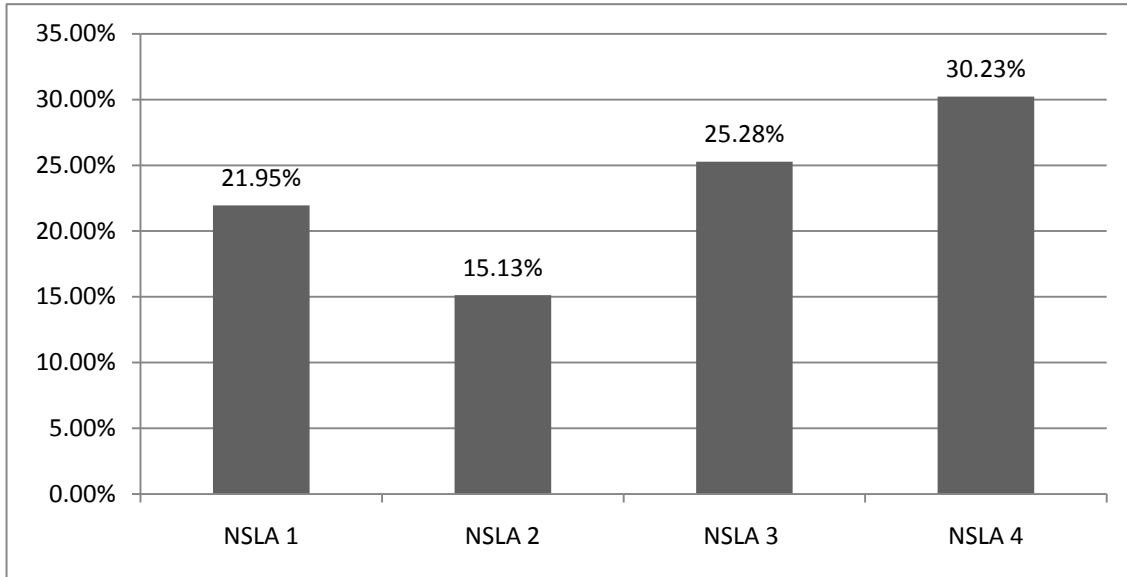ng that education would be funded based on what was needed and not on what was available. Even though education funding is considered protected in many ways because of this act, scrutiny of the effectiveness of educational expenditures continues. NSLA funds are just one area of educational expenditures that have been challenged in recent years (Reeve, 2010). As was explained in Chapter 2, there is widespread support for the belief that additional funding is required to educate students of poverty. In Arkansas, the *Adequacy Study* by Odden and Picus (2003) included recommendations for a categorical fund called the National School Lunch Act (NSLA) to assist students living in poverty. The members of the Arkansas General Assembly accepted these recommendations by passing.

Although the legislators created NSLA funding, there has been some dissension concerning how NSLA funds are spent, NSLA balances that are being carried over, how much revenue should be allocated for NSLA funds, and whether or not the funds are even needed. Since the creation of NSLA funding, a comprehensive study has not been conducted to determine the relationship between NSLA funding and student achievement. One focus in this study was to examine the relationship of NSLA funding to literacy and math achievement for fourth-, sixth-, and eighth-grade students in the state

of Arkansas. This issue was investigated in relation to four different NSLA levels. The independent variable was the NSLA level and the dependent variables were literacy and math achievement as measured with the state's Augmented Benchmark Exam. Another focus in the study was to examine how district administrators choose to allocate their NSLA funds by looking at districts' NSLA expenditures across the four NSLA levels. Descriptive statistics were used to analyze the data for this part of the study.

In this quantitative study, the achievement scores of 720 students were examined using the 2009 Arkansas Augmented Benchmark Exam for literacy and math for students in grades four, six, and eight. Analyses of this data were presented in Chapter 4 by examining each grade by NSLA level for literacy and math. Conclusions and reflections about the data collected and the analyses performed in this study are included in this chapter. Recommendations, implications, and the significance of the study are also described.

Conclusions

To address the hypotheses, the following statistical analyses were performed: Fourth-grade literacy scores were analyzed using a one-way ANOVA with NSLA level being the independent variable and literacy scores as the dependent variable. Sixth- and eighth-grade literacy scores were analyzed in the same way with the independent and dependent variables the same. Fourth-grade math scores were analyzed with a one-way ANOVA with NSLA level being the independent variable and math scores as the dependent variable. Sixth- and eighth-grade math scores were analyzed in the same manner with the same independent and dependent variables. Each hypothesis was tested at a .05 level of significance.

Hypothesis 1

Hypothesis 1 was that no significant differences would exist in the literacy achievement of fourth grade students in Arkansas public schools based on NSLA funding. Results from the one-way ANOVA indicated significant differences between the four NSLA levels. As a result, the null hypothesis was rejected. Bonferroni's post-hoc analyses were performed to examine differences among groups. NSLA level 1 showed significant differences from NSLA levels 2 and 4, and NSLA level 3 also showed a significant difference from NSLA level 4.

A review of the mean scores for fourth grade literacy achievement indicated NSLA Level 1 to be the highest, followed by NSLA Level 3, NSLA Level 2, and NSLA Level 4. These results were mixed when compared to current research. NSLA Level 1 is the lowest level of districts' free or reduced-cost lunch percentage, at less than 50%, and NSLA Level 4 is the highest level of districts' free or reduced-cost lunch percentage, at 90% and above. The mean scores of NSLA Level 1 and Level 4 support research indicating poverty as the most consistent predictor of academic failure (Land & Legters, 2002). However, NSLA Level 3 was in contradiction to that body of research with a higher mean score than NSLA Level 2. Another contradiction is that while NSLA Level 1 had a higher mean score than NSLA Level 3, the difference did not reach statistical significance, even though NSLA Level 3 districts have a 70% to 89% free or reduced-cost lunch percentage.

The lack of statistical significance between NSLA Level 1 and NSLA Level 3 and between NSLA Level 2 and NSLA Level 3 is also consistent with previous findings indicating that an increase in funding for students in poverty resulted in higher

achievement scores (Grissmer et al., 1998). A possible explanation may be the fact that in the current study NSLA Funding Level 1, which consists of all districts with less than 70% free or reduced-cost lunch percentage, was split into two groups, NSLA Level 1 and NSLA Level 2. Schools in both of these groups receive the same amount, $496 per free or reduced-cost student. School districts in NSLA Level 3 receive twice the amount of funding, at $992 per free or reduced-cost student. The NSLA Level 3 mean score was higher than NSLA Level 2 and NSLA Level 3 did not show statistical significance with NSLA Levels 1 and 2, indicating a possible relationship between the higher amount of funding and higher achievement scores. NSLA Level 4 schools receive the highest amount of funding at $1,488 per free or reduced-cost student, but their students had the lowest average scores of all the levels, significantly different from NSLA Levels 1 and 3. These results indicate that additional funding may have lead to improvements in literacy achievement in the mid-poverty schools (NSLA Level 3); however, it may not have led to the same results among fourth graders in situations of very high poverty (NSLA Level 4). A contributing factor that should be taken into consideration is that NSLA Level 4 schools not only have 90% and above free or reduced-cost lunch percentages, but also 90% and above minority populations, which researchers have found to be another factor that is negatively related to student achievement (Berne et al., 1999).

Hypothesis 2

Hypothesis 2 was that no significant differences would exist in the literacy achievement of sixth grade students in Arkansas public schools based on NSLA funding. Results from the one-way ANOVA indicated significant differences between the groups. As a result of this, the null hypothesis was rejected. Because there were violations of the

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assumption of homogeneity of variances for this analysis, the Games-Howell post-hoc was performed to determine differences among groups. NSLA Level 1 had a significant difference from the other three levels, as did NSLA Level 2 versus NSLA Level 4, and NSLA Level 3 versus NSLA Level 4.

A review of the mean scores for sixth grade literacy achievement indicated that NSLA Level 1 was the highest, followed by NSLA Level 3, NSLA Level 2, and NSLA Level 4. The results for sixth grade literacy were very similar to the results for fourth grade literacy. Results were again mixed when compared with other research. The mean scores of NSLA Levels 1 and 4 are consistent with research indicating poverty as the most consistent predictor of academic failure (Land & Legters, 2002). Surprisingly, NSLA Level 3 was in contrast to that body of research with a higher mean score than NSLA Level 2. The only difference with the sixth grade literacy scores was that NSLA Level 1 scores were significantly different from scores for all the other NSLA levels. In addition, NSLA Level 2 scores were significantly different from NSLA Level 4 scores for the sixth-grade students, while it was not been for fourth-grade students.

Scores for sixth-grade literacy also lead to mixed results when compared to research indicating that funds directed at poverty students are associated with higher achievement scores (Grissmer et al., 1998). As with the fourth grade, the NSLA Level 3 mean score was again higher than NSLA Level 2, indicating a possible relationship between the higher funds and higher achievement. The difference between these two levels was, however, not statistically significant. Similarly, NSLA Level 4 had the lowest scores of all levels with mean differences that were statistically significant compared to all other NSLA levels. This seems to lead to the conclusion that the additional funding

was not associated with higher literacy achievement for this level of poverty. As stated earlier, these results must be viewed in light of other intervening factors. For instance, NSLA Level 4 schools not only have 90% and above free or reduced-cost lunch percentages, but also 90% and above minority populations (Berne et al., 1999).

Hypothesis 3

Hypothesis 3 was that no significant differences would exist in the literacy achievement of eighth-grade students in Arkansas public schools based on NSLA funding. Results from the one-way ANOVA showed significant differences between the groups. As a result of this, the null hypothesis was rejected. Bonferroni's post-hoc analyses were performed to determine differences among groups. The results were that NSLA Level 1 had significant differences in mean literacy scores as compared to NSLA Level 3 and NSLA Level 4 schools. There were also significant differences between NSLA Level 2 scores versus NSLA Level 4 scores, and between NSLA Level 3 scores versus NSLA Level 4 scores.

A review of the mean scores for eighth-grade NSLA levels indicated NSLA Level 1 as the highest, followed by NSLA Level 2, NSLA Level 3, and NSLA Level 4. These mean scores are consistent with most research findings that indicate students of lower poverty have higher achievement scores.

The scores for eight-grade literacy were not consistent with research indicating that money directed at poverty students brings higher achievement scores (Grissmer et al., 1998). Even though districts in NSLA Level 3 and NSLA Level 4 receive substantially more NSLA funds that NSLA Levels 1 and 2, in this case, higher literacy achievement scores were not obtained.

Hypothesis 4

Hypothesis 4 was that no significant differences would exist in the math achievement of fourth-grade students in Arkansas public schools based on NSLA funding. Results from the one-way ANOVA indicated significant differences among the four funding levels. As a result, the null hypothesis was rejected. Bonferroni's post-hoc analyses were performed to determine differences among groups. NSLA Level 1 showed a significant difference from NSLA Level 4, NSLA Level 2 was significantly different from NSLA Level 4, and NSLA Level 3 was significantly different from NSLA Level 4.

A review of the mean scores for fourth grade math achievement indicated NSLA Level 1 to be the highest, followed by NSLA Level 2, NSLA Level 3, and NSLA Level 4. The fourth-grade math scores showed mixed results when compared to current research indicating poverty as the most consistent predictor of academic failure (Land & Legters, 2002). The mean scores for NSLA Level 1 were the highest and NSLA Level 4 math scores were the lowest among the groups. However, the differences between NSLA Level 1 and NSLA Level 2 and the differences between NSLA Level 1 and NSLA Level 3 did not reach statistical significance, meaning that there really was no measurable difference among these groups. This is surprising since school districts in NSLA Level 3 have a much higher free or reduced-cost lunch percentage than do school districts in NSLA Level 1.

Since there were no real differences between NSLA Level 1 and NSLA Level 3 and between NSLA Level 2 and NSLA Level 3, this is consistent with previous findings indicating an increase in funding for students in poverty resulted in higher achievement scores (Grissmer et al., 1998). Even though the mean scores for NSLA Level 1 were

higher than NSLA Level 2 and NSLA Level 3, the differences did not show significance. Since school districts in NSLA Level 3 receive twice the amount of funding as the school districts in NSLA Levels 1 and 2, these results indicate that the additional funding may have lead to improvements in math achievement. These results indicate that additional funding may have lead to improvements in math achievement in the mid-poverty schools (NSLA Level 3); however, it may not have led to the same results among fourth graders in situations of very high poverty (NSLA Level 4).

Hypothesis 5

Hypothesis 5 was that no significant differences would exist in the math achievement of sixth-grade students in Arkansas public schools based on NSLA funding. Results from the one-way ANOVA indicated significant differences among the four NSLA levels. Based on the results, the null hypothesis was rejected. Bonferroni's post-hoc analyses were performed to determine differences among groups. NSLA Level 1 showed a significant difference from all other levels; and NSLA Level 2 from NSLA Level 4.

A review of the mean scores for sixth grade math achievement indicated that NSLA Level 1 was the highest, followed by NSLA Level 2, NSLA Level 3, and NSLA Level 4. The results for sixth-grade math achievement are consistent with research indicating poverty as the most consistent predictor of academic failure (Land & Legters, 2002); since the mean scores were lower as the free or reduced-cost percentages of the districts increased. One point that was not consistent with previous research was that the difference in the mean scores between NSLA Level 2 and NSLA Level 3 and between NSLA Level 3 and NSLA Level 4 did not reach a statistical significance.

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The mean differences between NSLA levels for sixth-grade math were not consistent with research indicating that money directed at poverty students leads to higher achievement scores (Grissmer et al., 1998). NSLA Level 1 school districts showed a statistical significance with all the other levels. Districts in NSLA Level 2 were not significantly different from those at Level 3, and neither was NSLA level 3 and 4. This result indicates that districts with higher poverty were not different from the districts in the level directly below them, with the exception of NSLA Level 2. Although this is not strong evidence, there may be some indication that the additional funding is associated with higher math achievement in the mid-level, NSLA Level 3, and the highest level, NSLA Level 4.

Hypothesis 6

Hypothesis 6 was that no significant differences would exist in the math achievement of eighth-grade students in Arkansas public schools based on NSLA funding. Results from the one-way ANOVA showed significant differences among the four NSLA levels. As a result, the null hypothesis was rejected. Bonferroni's post-hoc analyses were performed to determine differences among groups. NSLA Level 1 showed a significant difference from NSLA Level 4, NSLA Level 2 showed a significant difference from NSLA Level 3 and NSLA Level 4, and NSLA Level 3 showed a significant difference from NSLA Level 4.

A review of the mean scores for eighth-grade math achievement indicated that NSLA Level 2 was the highest, followed by NSLA Level 1, NSLA Level 3, and NSLA Level 4. Results were mixed when compared to other research. The mean scores of NSLA Levels 3 and 4 were consistent with research indicating poverty as the most

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consistent predictor of academic failure (Land & Legters, 2002). The results for NSLA

Level 2 were not consistent with that body of research, although the difference in this

case was not statistically significant.

Even though NSLA Level 2 mean scores were higher than NSLA Level 1 mean

scores, this cannot be said to be consistent with research indicating that money directed at

poverty students leads to higher achievement scores (Grissmer et al., 1998). As stated

earlier, for the purposes of this study NSLA Level 1 and NSLA Level 2 were both at

NSLA Funding Level 1. Both of these levels receive the same amount of funding per free

or reduced-cost student; therefore, the higher achievement scores of the NSLA Level 2

school districts could not have been attributed to higher NSLA funding. In addition,

NSLA Levels 3 and 4 showed statistical significance from NSLA Level 2. Even though

the school districts in NSLA Levels 3 and 4 receive double and triple the amount of

NSLA funding than school districts in NSLA Level 2, the additional funding was not

associated with higher math achievement.

Research Question

The second research question was, "How do Arkansas public schools in the four

NSLA levels allocate their resource across 11 spending categories?" This question was

examined by using descriptive statistics. The top five categories of NSLA expenditures

for NSLA Level 1 in order from highest to lowest were curriculum specialists, other,

math/literacy/science coaches, classroom teachers, and nurses/counselors/social workers.

The "other" category combined several smaller expenditure categories (e.g., parent

education, early intervention, technology), as well as any other activities approved by the

ADE. Three of the five highest expenditure categories for NSLA Level 1 had a direct link to classroom instruction.

For NSLA Level 2, the top five categories of expenditures were classroom teachers, math/literacy/science coaches, other, nurses/counselors/social workers, and transfers to categorical funds. Two of the top three categories for NSLA Level 2 expenditures had a direct link to instruction. The fourth and fifth categories for NSLA Level 2 were less than 10% of the total expenditures.

Expenditure categories for NSLA Level 3 in order from highest to lowest were other, nurses/counselors/social workers, math/science/literacy coaches, pre-kindergarten, and classroom teachers. Only one of the top three categories had a direct link to instruction. The fourth and fifth expenditure categories for NSLA Level 3 were less than 10% of the total expenditures.

For NSLA Level 4, the top five categories of expenditures were other, before/after/summer school programs, classroom teachers, teachers' aides, and school improvement plan. Three of the top five expenditure categories for NSLA Level 4 had a direct link to instruction.

The four NSLA levels had two expenditure categories in common in the top five categories: classroom teachers and other. For NSLA Level 1, "other" was the second highest category, for NSLA Level 2, "other" was the third highest category, and for NSLA Levels 3 and 4, "other" was the highest expenditure category. The "other" category cannot be interpreted as a pattern of expenditures since no details can be extracted. NSLA Levels 1 and 4 had the most expenditure categories with a direct link to instruction. However, NSLA Level 4 had such a large percentage of its NSLA funds

allocated to the "other" category that the categories directly linked to instruction received a very small percentage of the overall allotment. None of the top five expenditures for Level 4 was allocated for math/literacy/science coaches or curriculum specialists. For NSLA Level 3, only one the top three expenditure categories could be directly related to instruction. The fourth and fifth categories were related to instruction, but were less than 10% of the total expenditures. NSLA Level 2 also had the fourth and fifth expenditures at less than 10% of the total. Of the top three expenditures for NSLA Level 2, two of them were directly related to instruction.

Expenditure categories that are not directly related to instruction, such as nurses, social workers, and counselors, are an allowable expenditure for NSLA funds. In three of the four NSLA levels, this category was found to be in the top five expenditure categories. If students' basic needs are not being met, it is very difficult for learning to be achieved (Maslow, 1987). Nurses, counselors, and social workers provide services to students to ensure that basic needs are being met. While this category may be an allowable expenditure, school districts should examine the evidence to see if it is related to student achievement.

The results of this study indicated that there were significant differences in the 2009 Arkansas Augmented Benchmark Examination scale scores for both literacy and math for the four NSLA levels for students in fourth, sixth, and eighth grades. For five of the six hypotheses, NSLA Level 1 students from districts with the lowest free or reduced-cost percentages outperformed all other schools. In the literacy evaluations, NSLA Level 3 students outperformed NSLA Level 2 at two of the grade levels, although the differences were not statistically significant. NSLA Level 4 students scored the lowest in

all six comparisons. Although NSLA Level 1 had higher scaled scores at almost all grades on both math and literacy, in three of the six comparisons the differences were not statistically significant.

The results of the study were mixed when compared to research that indicates low poverty levels to be the biggest indicator of achievement. Three of the six analyses did not coincide with that research when examining the mean scaled scores of the NSLA levels; however, even in the instances where students in a higher-poverty district scored higher, the differences were not statistically significant. Research indicating more funds provided to poverty students is also mixed using the same data. Even though some of the analyses indicated that students in higher-poverty districts performed higher when examining scaled scores, the differences were not statistically significant. Although the additional funding for poverty students may not have indicated significantly higher achievement scores for the districts with higher poverty levels, it should be noted that these districts showed no real differences. This lack of differences contradicts research that districts with lower poverty have higher achievement than districts with high poverty. The additional poverty funds could be a factor for this contradiction.

Data from the expenditure categories by NSLA levels did not indicate clear, specific patterns in expenditures. One point is that districts with lower poverty expended a larger percentage of their NSLA funds for academic coaches, curriculum specialists, and other items that were directly related to instruction. Schools in the two NSLA levels with the highest poverty had the most funds allocated to the "other" category. No details were given for what activities these funds were spent.

Recommendations

The results of this study were mixed in that in some instances the findings were consistent with current research indicating poverty as the most consistent predictor of academic failure (Land & Legters, 2002), but in other measurements the findings were in contradiction with that research. In some instances, students in higher-poverty districts performed higher on literacy and math achievement scores than did students in districts with lower poverty. The same data indicated mixed results in relation to the idea that money directed at disadvantaged students leads to higher achievement scores (Grissmer et al., 1998). Some of the findings were consistent with Hanushek's (1997) research indicating that increased funds did not show a relationship to increased student achievement. Research indicating the specificity of how education dollars are spent in relationship to student achievement is not always clear and even sometimes contradictory. However, the analysis of how NSLA funds were allocated at different NSLA levels was consistent with research indicating that increased funding for instruction and the reduction of class sizes increased student achievement (Wenglinsky, 1997).

The first recommendation is that a thorough examination of NSLA expenditures be conducted by to determine which allowable expenditures show the highest relationship to improving student achievement in literacy and math. Based on the results, district administrators could be provided with training on best practices for spending NSLA funds to make sure expenditures are having the highest possible impact on student achievement. Some of the allowable expenditures may prove to have minimal, if any relationship to improving student achievement. Some of the expenditure categories are

more directly related to instruction than others are. An extension of this recommendation could be for state administrators to provide school district leaders with recommended percentages for each expenditure category based on their research. A thorough analysis and recommendations for district administrators would be supported by a body of research indicating that it is not just more money that is related to improving student achievement, but specifically how the money is spent (Wenglinsky, 1997). Another suggestion is that different expenditure recommendations are implemented based on a school district's annual performance. District administrators meeting these standards could have more flexibility with NSLA expenditures than those who were not meeting the standards.

A substantial body of literature indicates that additional resources are needed so that students living in poverty can be provided with support services so that they can be successful in school. In one study, researchers have even asserted that twice the amount of funding is needed to educate students who are living in poverty (Duncombe et al., 2002). Based on this evidence, a second recommendation is for legislators to re-evaluate how they determine the percentages for the NSLA funding levels and the number of NSLA funding levels currently in place. NSLA Funding Level 1 encompasses all school districts with up to 69% free or reduced-cost lunches. The district with the smallest free or reduced-cost lunch percentage in the state in the school year 2008–2009 was 21%. The difference in a district at a 21% free or reduced-cost lunch percentage and one at a 69% free or reduced-cost lunch percentage is quite large. NSLA Funding Level 1 is also the largest of the three levels at 173 school districts.

To expand on the division of the NSLA funding levels, an analysis of the amount of money allocated to each NSLA level should also be conducted. Currently, school districts in NSLA Funding Level 1 receive $496 for every free or reduced-cost lunch student, NSLA Funding Level 2 receives $992 for every free or reduced-cost lunch student, and NSLA Funding Level 3 receives $1,488 for every free or reduced-cost lunch student. Results from this study indicate that additional funds may be a factor at raising student achievement. In two of the three literacy measurements, NSLA Level 3 school districts outperformed NSLA Level 2 districts. In three of the six measurements, NSLA Level 1 districts may have had higher mean scaled scores than NSLA Level 3, but the Bonferroni post-hoc did not show a statistical significance. NSLA Level 2 receives the same amount of funds as NSLA Level 1; however, NSLA Level 3 districts receive twice the amount of funds. There were areas where NSLA Level 3 students outperformed NSLA Level 2 students on achievement scores; therefore, the increased NSLA funds for Level 3 could be a factor in the increased achievement. Those districts in which higher-poverty students scored higher are certainly in contradiction with what most research shows (Land & Legters, 2002).

Another recommendation to incorporate with adding another NSLA level, bringing the total to four, is to change the amounts allocated to each level to provide a smoothing effect over the four levels. In the current law, the amount of funding per student for NSLA Funding Level 2 is double NSLA Funding Level 1, and NSLA Funding Level 3 is three times the amount of NSLA Level 1. These amounts are very drastic increases. Smoothing would be a process of retaining funding for districts with higher free or reduced-cost percentages but not at such extreme increases. A suggestion

would be to set NSLA Funding Level 1 at $300, NSLA Funding Level 2 at $600, NSLA Level 3 at $900, and NSLA Level 4 at $1,200.

Implications

Significance and Expansion of Knowledge Base

This study was focused on measuring literacy and math achievement scores at various NSLA levels and examining NSLA expenditures for a one-year period. A more extensive study that involved multiple years dating back to when NSLA funds were first created would lead to a more accurate and comprehensive picture of the relation between NSLA funds and student achievement. Student scores in NSLA Level 4 schools may be the lowest scores at all grade levels; however, a longitudinal study could be used to reveal if a pattern of increase or decrease in test scores is evident over time.

Since there has not been a study about the effects of NSLA funds on student achievement in Arkansas, the focus in this study was from to provide a general overview and a starting point for further conversations. A study in which a comparison was made of how legislators in other states are providing additional funds to impoverished students would be beneficial in determining if the categorical NSLA funds are the most effective way to allocate money among school districts.

The current study only involved NSLA funds and levels of poverty within the school districts. A study, in which other issues of the districts were addressed, such as minority levels, would also be useful in providing a more comprehensive look at other factors that could be related to student achievement. Although the districts in NSLA Level 4 had the lowest scores in all six measurements, it should be noted that all of those districts were not only over 90% free or reduced-cost lunches, but also over 90%

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minority. There is a large body of research indicating that student achievement is negatively associated with a high percentage of minority students (Berne et al., 1999; Grissmer, et al., 1998; King et al., 2003). Slavin (1999) even suggested weighted funding for poverty students and minority students.

Analyses of NSLA expenditures did not indicate clear and specific patterns that could be used to influence decisions affecting student achievement. More detailed expenditure information is needed instead of just district-level expenditures. District administrators who have allocated the majority of funds at the primary grades may be seeing increased student achievement at those grades; however, the middle-level grades may not benefit from increased student achievement. The mean scores for NSLA Level 3 students were higher than NSLA Level 2 students on literacy achievement for fourth- and sixth-graders, but not for eighth-graders. It would be interesting to see how those district administrators had allocated the NSLA funds among different grade levels. If academic coaches or teachers were all funded at the elementary level, then that could be a reason for the increase at the elementary level, but not at the junior-high level. Another issue is that the "other" expenditure category was one of the largest categories for all NSLA levels. Information that is more specific would need to be provided by districts to allow for an accurate analysis to determine the effectiveness of how the NSLA funds are being allocated.

Future Research Considerations

One possible focus for future researchers could be to do a multi-year analysis of student achievement by NSLA levels beginning with the 2004–2005 school year. Such a study would involve more than a snapshot for just one year, and would lead to an in-

depth perspective on changes in student achievement over several years. Future researchers could also study in more detail the expenditures of district administrators and compare this to student achievement. As with the previous suggestion, such a study could be used to provide educators with an insight of how high-achieving district administrators allocate their NSLA funds. Another possibility for future research would be to include other factors such as minority and LEP students with NSLA level and perform a factorial ANOVA to determine any interaction effects.

Potential Policy Changes

Accountability for education has become even more rigorous with the increased amount of public funds that are going to support education (Granger, Durlak, Yohalem, & Reisner, 2007). School administrators must therefore strive more than ever to make decisions about the expenditure of funds that are based on practices supported by empirical research and that are shown to be positively related to student achievement. Policy makers at the state level must also come to terms with the evidence suggesting that it does require additional resources to educate students who are living in poverty (Slavin, 1999). Educators and state policy makers must work together diligently to insure that NSLA funds continue to be allocated to the students that so desperately need additional services and support. Policy makers should and must ask if these funds are making a difference in the achievement of these students for whom they are intended. If, based on research, a determination is made that the funds are not achieving the intended effect, and then policy makers should make every effort to determine the reasons and make appropriate changes in how the funds are expended. All of these decisions should be

based on solid research, not just on the personal opinions of educators or state policy

makers.

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APPENDIX

Appendix A

Status of Request for Exempted Review

HARDING UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Status of Request for Exemption from IRB Review
(For Board Use Only)

Date: May 6, 2010

Proposal Number:
(to be assigned by IRB administrator)   2010-38

Title of Project: Effects of Poverty on Math and Literacy Achievement in Arkansas

Name and contact information for the Principal Investigator: Karen C. Smith

■ Research exempted from IRB review.

☐ Research requires IRB review.

☐ More information is needed before a determination can be made. (See attachment.)

I have reviewed the proposal referenced above and have rendered the decision noted above. This study has been found to fall under the following exemption(s):

1 ☐   2 ☐   3 ☐   4 ■   5 ☐   6 ☐

In the event that, after this exemption is granted, this research proposal is changed, it may require a review by the full IRB. In such case, a *Request for Amendment to Approved Research* form must be completed and submitted.

This exemption is granted for one year from the date of this letter. Renewals will need to be reviewed and granted before expiration.

The IRB reserves the right to observe, review and evaluate this study and its procedures during the course of the study.

[signature]

Chair
Harding University Institutional Review Board