

The Pennsylvania State University

The Graduate School

College of Education

**ESTIMATING THE COST OF "NO CHILD LEFT BEHIND" AT THE LOCAL
SCHOOL LEVEL**

A Thesis in

Educational Administration

by

George E. White

© 2006 George E. White

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Education

December 2006

The thesis of George E. White was reviewed and approved* by the following:

William T. Hartman
Professor of Education
Thesis Advisor
Chair of Committee

James F. Nolan
Hermanowicz Professor of Teacher Education

Roger C. Shouse
Associate Professor of Education

Edgar P. Yoder
Professor of Agricultural and Extension Education

Nona A. Prestine
Professor of Education
Professor in Charge of Educational Leadership

*Signatures are on file in the Graduate School

ABSTRACT

The ingredients approach was used to estimate the cost of one school's effort to comply with the reading and writing achievement goals as established for Pennsylvania schools in response to the No Child Left Behind (NCLB) Act of 2001. The improvement strategies used in this study were aimed at raising the achievement of all students. While successful in moving students to proficient and advanced performance levels as measured by the Pennsylvania System for School Assessment, the intervention strategies failed to move all students to proficiency. Students with disabilities were among those most resistant to the intervention strategies. Three constituents, including the District, the Federal Government, and Teachers and Administrators, bore the three year best estimate cost of \$352,264. Personnel costs, specifically classroom teachers, accounted for the largest percentage of this total cost. Teacher after-school work accounted for 44.4% of the total cost.

TABLE OF CONTENTS

List of Figures	v
List of Tables	vi
Acknowledgements	vii
Chapter 1: INTRODUCTION.....	1
Statement of Purpose.....	3
Chapter 2 : A REVIEW OF LITERATURE.....	6
Chapter 3: METHODOLOGY.....	23
Chapter 4: RESULTS.....	45
Chapter 5: CONCLUSIONS.....	70
Bibliography.....	80
Appendix A: Intervention Log.....	85
Appendix B: 1999 PSSA Reporting Format.....	93
Appendix C: Concentric Circle Model.....	94
Appendix D: Personnel Costs.....	95
Appendix E: Facilities Costs	96
Appendix F: Equipment Costs.....	99
Appendix G: Supply Costs.....	100
Appendix H: Utilities Costs.....	102

LIST OF FIGURES

1 Concentric Circle Model.....	22
--------------------------------	----

LIST OF TABLES

1	NCLB Annual Targets for Pennsylvania Schools.....	13
2	Exposure to Intervention.....	32
3	Conversion of Pre-2000 PSSA to Post-2000 Format.....	34
4	Sample Cost Worksheet.....	35
5	Consumer Price Index.....	37
6	Intervention Subgroups.....	47
7	Reading PSSA Results: Groups A,B,C and D	49
8	Tracking Individual Score Changes Between Grades 5 and 8: Group C Individual Reading.....	51
9	Tracking Individual Score Changes Between Grades 5 and 8: Group D Individual Reading.....	52
10	Writing PSSA Results: Groups A,B,C and D	53
11	Tracking Individual Score Changes Between Grades 5 and 8: Group C Individual Writing.....	54
12	Reading PSSA Results: Groups A,B,C and D Students with Disabilities...	56
13	Writing PSSA Results: Groups A,B,C and D Students with Disabilities...	57
14	Reading PSSA Results: Groups A,B,C and D Gender.....	58
15	Writing PSSA Results: Groups A,B,C and D Gender.....	59
16	Tracking Individual Score Changes Between Grades 5 and 8: Group C Individual Gender Reading.....	60
17	Tracking Individual Score Changes Between Grades 5 and 8: Group D Individual Gender Reading.....	61
18	Tracking Individual Score Changes Between Grades 5 and 8: Group D Individual Gender Writing.....	62
19	Final Intervention Costs: Constituent Shares.....	63
20	Concentric Circle Model: Resource Allocation.....	64
21	Final Intervention Cost Worksheet: Constituent Shares.....	66
22	Intervention Costs by Category: Best Estimate.....	67
23	Three Costs: Personnel In-School and After-School.....	67
24	Bracketed Costs: In-School Faculty: August 2001 to July 2004.....	68
25	Bracketed Costs: Personnel After-School Faculty: August 2001 to July 2004.....	68
26	Bracketed Costs: Three Year Cost Comparison.....	69
27	Three Year Per Student Cost Estimate.....	74

ACKNOWLEDGEMENTS

I would like to acknowledge the contribution of my wife, Debbie, whose constant encouragement and support were instrumental to the completion of this study.

CHAPTER 1: INTRODUCTION AN STATEMENT OF PUPROSE

Introduction

Accountability has become the driving force in educational policy in the United States. Consequently, America's public schools are under more pressure to perform than ever before. Many educators believe that the current demand for school accountability can be traced back to the 1983 publication of *A Nation at Risk* (McREL, 2002). Whether or not this is the case, one fact is certain, school administrators responded to accountability demands with a new sense of urgency after January 8, 2002, when President George.W. Bush signed into law the No Child Left Behind (NCLB) Act of 2001. While schools had begun to search for the resources necessary to raise test scores before the enactment of NCLB, this federal law raised the stakes by introducing rewards and penalties and by making performance-based accountability a mandate (Hess, 2004). The Pennsylvania System for School Assessment (PSSA) is used in Pennsylvania schools to measure student achievement in Writing, Reading, and Math. Efforts to find the resources necessary to raise student performance on the PSSA have risen commensurate with the penalties that failing schools now face under the new NCLB federal law. And, despite complaints by some states that compliance with the new law is too costly (Hoff, 2004), Pennsylvania Governor Rendell has remained firm in his commitment to achieving the goals of NCLB. In his 2004 budget presentation Governor Rendell, in urging legislators to increase accountability funding by an additional \$75 million, stated "given the demands of the federal No Child Left Behind law, to not make this investment would be unwise" (ILS, 2004a, pg. 1). Thus, in Pennsylvania, as in every state across this nation, schools continue to search for effective programs and services and the necessary resources to meet the goals and requirements contained within NCLB.

Shortly after NCLB became law, several states commissioned studies to examine its cost. These early studies were based on estimates of costs for such programs as tutoring, summer school, and employment of highly qualified instructors (Hoff, 2004). Although important in helping to understand the cost of heightened accountability, such studies painted with broad strokes, relying on statewide assumptions of hypothetical district practices. In fact, some researchers questioned the accuracy of these statewide

cost estimates. Guthrie (2004) noted that many of these studies included unsupported assumptions which led to huge dollar amounts being reported for NCLB compliance. More recently states have pooled their resources to estimate the costs for NCLB compliance at both the state and local levels. The Council of Chief State School Officers NCLB commission (CCSSC), a group of twelve states examining NCLB costs, conducted a series of studies to estimate the cost for NCLB compliance. At least three consortium members have published their results. New Mexico (Augenblick, Palaich et al, 2005), Connecticut (Sternburg, 2005), and Minnesota (Patterson and Alter, 2005), all concluded that NCLB was under funded. A report published by the Pennsylvania School Board Association (PSBA, 2004, pg. 1) attempted to identify the ten most costly compliance requirements which schools should "cost out as a first step in building a financial strategy." Among these top ten cost items they include curriculum development and class size reduction, two approaches utilized in this study.

A complete understanding of the financial impact of accountability under NCLB requires insight into what is happening at the school level. An analysis of school-level costs tied to interventions specifically aimed at raising scores on statewide tests can provide a more complete picture of the costs for NCLB in Pennsylvania and help to address concerns, such as those raised by Guthrie, that current estimates are inaccurate. Administrators and policymakers need to have access to more detailed information concerning the programs and services that schools are actually implementing to move all students to proficiency on the PSSA and how schools are finding the resources to support these efforts. Understanding the impact of accountability legislation at the local school level is a critical component of our overall understanding of this legislation and how it is impacting resource allocation. As Picus (2000, pg. 1) explained in referring to the ambiguous results of productivity studies, "One thing is clear-before we fully understand how to make schools more productive, we must better understand how schools use the resources currently available to them."

Purpose

The purpose of this study was to examine the cost and resource allocation patterns associated with one rural Pennsylvania high school's attempt to move students toward higher performance on the Pennsylvania System for School Assessment (PSSA) as required under the No Child Left Behind Act (NCLB) of 2002. Specifically, it analyzed the cost and resource allocation pattern for an intervention selected and implemented by the high school to raise PSSA scores for all students in grade 8 Reading and grade 9 Writing over a three year period beginning in September 2001.

Specific research questions examined were:

1. How were students identified for intervention strategies and how many were there in each subgroup? What was the performance of each subgroup?
2. What intervention strategies were used to prepare students to take the eighth grade Reading and ninth grade Writing PSSA?
3. What were the results of this intervention in terms of the number of students attaining proficiency? How did the results compare to student scores before the intervention?
4. What resources were used with the intervention strategies? Were the resources that were utilized new or additional to the existing program or were they reallocated from existing high school or district resources? Who are the constituents sharing costs and what is the percentage of each constituent's share?
5. What were the costs of resources used for intervention strategies?

Identifying the true cost for NCLB compliance and understanding how this law has impacted resource allocation at the school level is an important first step in assessing the law's impact and viability. Unfortunately, several factors make such a cost analyses

difficult. The NCLB law is complex with many requirements. However, of all its many requirements, that of raising all students to proficient levels of performance is widely considered to be its most costly. This study focused on raising student achievement in reading and writing.

In addition to the many requirements contained within NCLB, at least one additional factor has complicated attempts to estimate the cost for its implementation. Each school has responded to NCLB with different programs unique to their local situation. All of this variability confounds attempts to estimate the true cost for NCLB compliance and, thus, our understanding of how it has impacted resource allocation at the local school level. Ultimately, a true understanding of the cost for NCLB compliance will emerge only when numerous school level cost studies are available from which to build an overall cost picture. This study proposes to contribute to this process by providing a piece of this puzzle. Answers to the questions posed above will provide accurate data on the cost of the specific steps one school took to move all students to proficiency in reading and writing as measured by Pennsylvania's statewide test, the PSSA. The results of the study will be of obvious value to the school district in future resource allocation decisions. And, combined with similar studies at other schools (Reitz, 2006) it can contribute to an emerging understanding how NCLB compliance is impacting Pennsylvania school budgets. Such information has not been available from early estimates for the cost of NCLB since, of necessity, these estimates were based on assumptions about how schools "might" allocate resources in response to NCLB. More recent studies such as those completed in New Mexico (Augenblick, 2005), Connecticut (Sternberg, 2005), and Minnesota (Patterson, 2005), while examining some school levels cost, do not provide information about costs born by Pennsylvania schools.

Looking Ahead

In Chapter 2, after a brief history of accountability in education is presented, key provisions of the No Child Left Behind Act are reviewed with specific attention paid to student achievement targets and subgroup specifications. The ingredients method, the approach used in this study to determine costs in education, is then described in some

detail. Additionally, the Concentric Circle Model is introduced as a tool for analyzing resource allocation. Chapter 3 specifies the methods used for data collection and presents the implementation methodology for the ingredients approach. Information about the school, the intervention to raise student test scores, and the students that served as the subjects of this study are also provided here. Chapters 4 and 5 present the results and conclusions of the study including suggestions for future cost studies that might reveal further insight into the costs for implementing the No Child Left Behind Act of 2002.

CHAPTER 2: A REVIEW OF LITERATURE

Introduction

The No Child Left Behind Act represents the culmination of two decades of rising accountability pressure on schools. A review of the historical events leading up to NCLB, as well as a discussion of the content of this law, are necessary to put the present study in proper context. This will be followed by a look at approaches to estimating costs in education with special attention paid to the cost approach used in this study, thus providing a foundation for understanding the final cost data. A review of resource allocation research will aid in understanding the impact of NCLB. Finally, the Concentric Circle Model will be presented as a tool for analyzing the resource allocation patterns in this study.

Background :The Rise of Standards, Testing and Accountability

In his book, *Who Controls Our Schools*, Kirst (1984) summarized some of the changing themes in American education from equity issues in the 1960's, to freedom of choice in the 1970's, to excellence in the 1980's. Adequacy and efficiency issues have also been major themes in school finance and educational policy over the past three decades (Chambers, 1999). As we enter the 21st century, the new buzzword is "accountability." Alarmed by reports such as *A Nation at Risk*, which showed that our students were not performing as well as those in other countries, Americans began to lose faith in public schools (Boyd, 1999; Boyd & Hartman, 1998). Indeed, many experts began to assert that public schools could not provide the "excellence" in education that was required if America was to compete in an emerging global economy. Proponents of free market solutions such as vouchers, school choice, and charter schools began to call for radical changes in educational policy (Chubb & Moe, 1990). These free market approaches sprang from the belief that schools were failing due to their lack of "accountability" since they do not conform to market mechanisms.

During this same period members of the Reagan administration used their "bully pulpit" (Boyd, 1988) to bring education into the federal spotlight while placing

responsibility for raising student achievement squarely on the shoulders of states. State officials soon began searching for strategies for improving student performance. Diane Ravitch (1995), Secretary of Education under George Bush, Sr., called for the establishment of national education standards. Although national standards never evolved, standards were quickly adopted by states after passage of the Goals 2000: Educate American Act in 1989 (CEPI, 2004). This legislation encouraged states voluntarily to adopt rigorous standards linked to testing or assessments. By the late 1990's every state except Iowa had developed standards along with statewide testing (McREL, 2002). The emerging high stakes testing environment has increased the pressure on public schools. Test results are now readily available to the public in newspapers and on websites. Parents have used these test results both to rate their own schools and to compare public school performance to nonpublic alternatives. Thus, as the 1990's came to a close, the accountability movement was in full bloom. Pennsylvania was a part of this movement. In fact, Boyd (1988) points to Pennsylvania as one example of how the *Nation at Risk* rhetoric influenced states. Pennsylvania's educational-reform package at that time was called "Turning the Tide", an obvious reference to the oft repeated *Nation at Risk* phrase, "rising tide of mediocrity."

Inevitably, as the demand for accountability increased, tensions arose between accountability and money. As the federal government continued to demand that schools move all students to high standards of proficiency, state and local education officials asked where the money would come from to implement new programs and services needed to raise student achievement. In Pennsylvania, student achievement for NCLB is measured by the PSSA. In discussions with other principals, this author observed that schools employed a variety of strategies to raise these PSSA scores including hiring tutors, purchasing PSSA workbooks, revising courses, reducing class sizes, and developing special PSSA courses for "at-risk" students (Clarion County Principals Association meeting, October 9, 2003) These programs and services were intended to help students become proficient in Reading, Writing, and Math. However, the costs to schools of these efforts are unknown; likewise the revenue sources to support these activities are unclear. The full costs related to raising test scores are even murkier; these

include costs born by constituents other than the school such as parents, faculty, and other agencies. For example, no information is available regarding the cost to faculty for after-school time associated with NCLB activities. Such information cannot be determined from examining either state or local school district budgets. Only a full cost analysis can determine these costs. A study commissioned by the Office of the Legislative Auditor for the state of Minnesota (Patterson & Alter, 2005) was among the first to collect school level data on the cost of implementing NCLB. The Minnesota State Department of Education identified two-hundred activities and queried a sample of nine schools regarding their estimate of the cost for each activity. New Mexico (Augenblick et al, 2005) and Connecticut (Sternburg, 2005) conducted similar studies. Each of these studies noted the subjective nature of their NCLB cost estimates because the school level data they collected were based on the best recollection of staff as to the time devoted to specific activities. Although the present study suffers from this same subjectivity, this problem was mitigated by the use of documents such as logs and lesson plans to corroborate estimates.

The Cost of High Standards

Even before passage of NCLB in January 2002, many researchers had turned their attention to the cost of moving all students to high levels of achievement. Columbia University professor, Gary Natriello, in reviewing costs of changes in the New York regents exam, affirmed that to get better outcomes, "is going to cost the public a lot." In a presentation to New York City superintendents entitled *Estimating the Resources Necessary to Meet the New Standards*, Natriello (1998) remarked, "I don't think there is a clear sense what new standards involve. I do not believe people have seriously thought about what has to be in place to achieve the goals they have articulated and certainly no one has thought hard about what it might cost." A similar observation might be made about the framers of NCLB.

The National Education Association estimated that full implementation of NCLB for 2004 would cost the federal government \$41.8 billion (Hoff, 2004). This is nearly twice the \$24.8 billion authorized by the federal government for schools in 2003. The

report also concluded that the effort would hit rural schools the hardest. This result has important implications for Pennsylvania since 243 of the 501 school districts in here are considered to be rural (Center for Rural PA, 2003).

As it became clear that NCLB would become law, states wasted no time in projecting more accurate costs for compliance. One of the first to emerge came from Ohio. This early study, considered at that time to be one of the most thorough, estimated that compliance with NCLB would cost the state over \$1.5 billion or twice what it received in federal funding (Hoff, 2004). While critics downplayed these cost estimates for NCLB (United States Secretary of Education, Rod Paige, called the Ohio study, "overstated.", Education Week, February 2004), most agreed that raising student achievement would probably be the most costly aspect of the NCLB law. Reschovsky (As cited in Hoff, 2004), for example, studied test results data in Texas and estimated they would have to double funding to boost performance in the worst performing school districts. Odden and Archibald (2001), in their book, *Reallocating Resources: How to Boost Student Achievement Without Asking for More*, described strategies for raising achievement without raising expenditures. However, the authors also stated that moving all students to high levels of achievement, especially lower achieving students, would probably require additional resources. Resnick (2004) listed the top ten costs associated with meeting the requirements of NCLB. Fourth on this list were costs associated with new interventions such as those in this study. Also on this list were "staff and opportunity costs." As Resnick explained, "Compliance with NCLB will also require a significant commitment of time by administrators, principals, and teachers for program implementation and reporting" (pg. 2).

Virginia, North Dakota, Vermont, and Utah have also been vocal in expressing their concern about the cost of implementing NCLB. When the Vermont Society for the Study of Education looked at the question of whether it was cost effective for the state to accept monies under NCLB, they concluded that, "in accepting \$56 million the state was committing itself to \$158 million in expenditures."(Mathis, 2002). The state of Utah passed a bill in January 2004 to opt out of the NCLB and later amended it to state that it

would only comply with portions of the law that were funded. The rationale behind their new bill is based on Section 9527 of the NCLB Act which states, in essence, that nothing in the law was to be construed to mandate that states incur costs not paid for by the act (ILS, 2004b).

Other experts have pointed out that many of the expenses included in these early estimates are costs that schools would incur without NCLB. Hanushek (as cited in Hoff, 2004) contends that, "The question is: "How do you separate out the added cost of NCLB from what they would be doing anyway?" (Hoff, 2004, pg. 22) In developing their estimates states such as Ohio, Vermont, and Virginia have assumed that funding will flow into existing allocation patterns. Guthrie (2004) suggests that schools will reallocate funds into new programs which better support NCLB. The results of this study may provide some insight into this contention. Odden (as cited in Hoff, 2004) contends that states committed to raising standards long before NCLB. "If such states backed away from funding needed to raise achievement, many would end up in adequacy lawsuits. (pg. 22)" Hanushek believes that state legislators have actually used the law to get the federal government to pay for services that states would have to pay for anyway.

As states and school districts have begun to implement the provisions of NCLB, data regarding the cost of specific activities related to NCLB have become increasingly available. The Council of Chief State School Officers (www.grassroots.com) have formed a fourteen school consortium to examine state and school level costs for NCLB. The consortium has identified a list of activities so that cost estimates are consistent within each state. Several of the consortium members have reported results. Connecticut was the first to publish their cost results. Three Connecticut districts collected school level data from nine categories requiring eighty activities related to compliance with NCLB. These categories included ensuring highly qualified staff, parent notification, adequate yearly progress tasks, school improvement activities, administering Title I, addressing English Language proficiency, school choice, supplemental educational services, curriculum assessment, and overall NCLB compliance. As a group, these three districts identified funding gaps of between \$3.8 to \$10 million. However, several of the

categories identify costs that would only be incurred by schools that were not making adequate yearly progress.

A New Mexico (Augenblick, 2005) study looked at state and district level costs for NCLB. Five New Mexico school districts collected data using templates developed by the consulting firm of Augenblick, Palaich, and Associates (APA) and adapted to each district's unique costs. These costs included, among other things, such NCLB requirements as aligning to state standards, ensuring highly qualified personnel, school improvement, data management, and parent notification. The cost to districts was estimated to be between \$225-\$335 per pupil statewide. In September 2005 it was reported (CEPI, 2005) that Virginia initiated a study to examine the state and school level costs for NCLB compliance. Eight Virginia schools have begun to collect data on the cost for every aspect of NCLB

If the cost estimates from these studies prove to be accurate, districts will need to be more attentive to their choices when they deploy resources. As Hadderman (1999, pg. 2) commented, " On one thing all [education finance] researchers do agree; resources are shrinking; research should examine how funds are actually spent; and schools must discover more cost effective ways to allocate and utilize existing resources. " Although not specifically a cost-effectiveness study, this study can yield valuable information about how school funds are actually spent.

The No Child Left Behind Act

The No Child Left Behind (NCLB) Act is the most recent incarnation of the 1965 Elementary and Secondary Education Act (EESA), which was passed to provide federal dollars to help educate disadvantaged students. In reauthorizing the 2001 EESA the federal government increased the funds flowing to schools while also increasing school accountability. A full discussion of the one-thousand seven hundred page NCLB law is beyond the scope of this paper. In general, it purports to refocus education on four principles (NASSP, 2003) including accountability for student achievement, increased flexibility and local control, a greater role for parents in their children's education, and

greater emphasis on the use of scientifically based instruction. In addition, the law calls for higher educational standards, annual testing to measure student progress toward achieving higher standards, yearly analysis of test results, and rewards and penalties for schools that do not make "Adequate Yearly Progress" (AYP).

Exactly how AYP is to be measured is left to each state. Complaints from schools regarding fairness have prompted Pennsylvania to change the rules for meeting AYP. At the time of this study both districts and individual schools were required to meet AYP for all subgroups. Pennsylvania reports scores for the following subgroups: gender, disability, socioeconomic class, and race. Subgroups which are required to meet AYP include whites, African Americans, Hispanics, Asians, Native Americans, multicultural students, students with disabilities, students with limited English proficiency and, students who are economically disadvantaged.

In Pennsylvania, the original subgroups targets included four criteria. First, they had to demonstrate proficiency in meeting reading, writing, and math standards as demonstrated by their performance on the PSSA. Although NCLB expects all students to be proficient by the year 2014, interim targets have been established. The annual targets for Pennsylvania are shown in Table 1. Second, all subgroups were required to demonstrate 95% participation rate for the PSSA. Third, all subgroups were required to attain at least an eighty percent (85) graduation rate or show growth over time. Fourth, all subgroups had to maintain a 95% attendance rate or show growth. In 2005, this final criteria was removed and the graduation rate was been reduced to 80% or growth.

Schools failing to meet any of the three criteria for one or more subgroups for two consecutive years are deemed to have not met AYP. The sanctions increase each year. Once schools have been identified as having failed to meet AYP, they must provide the option for students to attend another high performing school within the district and they must enact a two-year improvement plan. The state provides technical assistance in the development of this plan. Once identified, if schools again fail to make AYP for a second straight year, they must continue to permit students the option of attending other schools

in the district and provide supplemental education services to students. After two years as an identified school "corrective action" is required. This can include a number of actions such as replacing staff, implementing research-based curricula, decreasing management authority, seeking outside advice, extending the school year, or restructuring internal organization. After one full year of "corrective action" schools are required to pursue restructuring if they again fail to make AYP.

Another critical requirement of NCLB is that all student subgroups must make AYP. Thus, an entire school could make AYP; however, if any of the identified subgroups do not, the entire school is classified as failing to make AYP. For purposes of NCLB, data are disaggregated for poverty levels, race, gender, ethnicity, migrant status, disability, and limited English proficiency.

This study focuses on achievement of proficiency on Pennsylvania standards as measured by performance on the Pennsylvania System for School Assessment (PSSA).

Table 1

NCLB Annual Targets for Pennsylvania Schools¹

Year	Reading Targets	Math Targets
2002-03	45% proficient	35% proficient
2003-04	45% proficient	35% proficient
2004-05	54% proficient	35% proficient
2005-06	54% proficient	45% proficient
2006-07	54% proficient	45% proficient
2007-08	63% proficient	56% proficient
2008-09	63% proficient	56% proficient
2009-10	63% proficient	56% proficient
2010-11	72% proficient	67% proficient
2011-12	81% proficient	78% proficient
2012-13	91% proficient	89% proficient
2013-14	100 % proficient	100% proficient

Source: Pennsylvania School Boards Association Bulletin, Vol. 68 (1), pp. 32, February 2004

¹The proficiency targets begin at a statewide baseline that was derived from the 2002 test scores.

As required by NCLB, Pennsylvania has described performance levels for the PSSA. These four levels are "below basic", "basic", "proficient", and "advanced." For a school to demonstrate AYP, all students must score in the "proficient" or "advanced" range by the year 2014. In their analyses of the costs of implementing NCLB, the state of Ohio determined that this provision of the law would be the most costly (Hoff, 2004). It is this requirement that caused the high school in this study to implement an intervention aimed at moving, if not all, at least more students to proficiency.

Cost Analysis

Given the rise of accountability in education it would seem logical that school leaders would want to know what their money is buying. A variety of fiscal analysis tools have been developed to analyze school spending. Rothenburg (1975) was among the first to suggest the use economic evaluation to help to direct the planning of social policies. Levin (1975) is widely regarded as a pioneer in applying economic evaluation to educational decision making. His book, *Cost-Effectiveness: A Primer(1983)*, discusses four approaches to cost analysis including cost-benefit, cost-effectiveness, cost-utility, and cost-feasibility studies. Levin's "ingredients" approach has become one of the primary methods for measuring educational resources.

There are other methods for analyze educational costs. The Resource Cost Method (RCM) also measures resources in terms of the ingredients used but takes the further step of organizing these ingredients in terms of service delivery (Chambers,1999). This approach has as its primary goal to gather data that permit the relationship between inputs and outputs to be more clearly observed. To do this, data on inputs are organized around the ways in which services are delivered to students. A "service delivery system" is defined as a collection of resources (inputs) that are aimed at providing a specific service to an identified group of students. Often this is a self-contained classroom or a pull-out program. A primary goal of those who support RCM is to standardize cost methods so that inputs and outputs are more closely linked and to permit comparison of programs and services across different states. By tracing costs back to the classroom level, as Monk suggests (as cited in Chambers, 1999) or even to the student level (See

Berne & Stiefel, 1995), it is hoped that services and programs can more easily be compared between schools.

Despite the availability of cost analysis tools, Rice (2002) reports that they are seldom used to analyze school spending. Levin (1991) found little evidence of cost analyses in his review of studies presented at the American Educational Research Association meetings between 1985 through 1988. Monk and King (1993) reported a similar finding when reviewing scholarly journals in the field of school finance. In examining the educational research to determine if cost analysis techniques were being properly applied, they reviewed articles published in the *Education Evaluation and Policy Analysis* and the *Journal of Policy Analysis and Management*. Among other things, they found twice as many references to cost analysis in EEPA than JPAM. They attributed this difference to the difficulty in identifying and linking educational inputs to student outputs.

Other researchers have noted the lack of sound cost analysis studies in education and have attempted to address it. Hummel-Rossi and Ashdown (2002) looked at economic evaluation in health and medical fields in an attempt to offer recommendations for improving cost analysis in education. In their study they cite the work of Barnett as exemplary in giving further direction to the development of cost analysis in education. Barnett (as cited in Hummel-Rossi and Ashdown, 2002), based on his study of Perry pre-school, cited nine steps for cost-benefit or cost-effectiveness analysis that complement Levin's ingredients approach by helping to consider often overlooked costs and program effects. However, these nine recommendation are specific to cost-benefit and cost-effectiveness studies and provide very little direction for a simple cost analysis. Hummel-Rossi and Ashdown (2002) also refer to a 1996 report from the U.S Department of Health and Humans Services which makes seven specific recommendations for improving the value of cost analysis. Although these suggestions were originally directed to health field researchers, they easily adapt to education and do inform this study.

Rossi and Ashdown cite, for example, the importance of identifying all resources as a key to conducting a meaningful cost analysis. This recommendation can be particularly problematic when it comes to identifying human resources. People typically form the core of any intervention program. However, their interactions and motivations of are in constant flux, thus making it difficult to identify or characterize their role in the success of an intervention (Murnane & Nelson, 1984). Obviously, the ability to identify such human resources would be critical to determining the potential to repeat the intervention at other schools. For example, the knowledge level of existing faculty is critical to the success of an intervention yet would be difficult to transport to another schools. Likewise, the impact of local school culture on an intervention is difficult to assess. For example, it might be expected that high academic press (Shouse,1996) would impact the implementation of an intervention. If so, this aspect of school culture becomes a hidden resource which is difficult to value. Monk and King (1993) refer to these as "subtle costs" which analysts must be aware of. These "subtle" costs seem to resonate with Resnick's "staff and opportunity costs." discussed above. Identification of these costs was a focus for this study.

Resource Allocation

Beyond the enduring controversy surrounding the link between money and school productivity is the simple fact that some resources are necessary to produce student outcomes. Schools have two sources for additional resources: they can reallocate current funds or raise additional funds. Odden and Clune (1995) projected that "the future challenge [of school finance] will be to produce substantially higher student achievement with flat or stable resources." This prediction does not bode well for schools given the fact that many researchers have concluded public education does a poor job of resource allocation. In fact, Odden and Clune (1995) found poor resource distribution to be evident across all states, districts, and schools.

Hartman (1998) explored resource allocation at four high schools in Oregon. He concluded that, "Student outcomes were not explicitly considered in the resource allocation process of any of the four high schools studied"(pg. 146). This result would

seem to echo Picus' (1996) conclusion that districts tend to deploy resources in the same basic proportions regardless of available funding. Hartman (1998) posited three explanations for this observation; lack of incentives, lack of knowledge, and lack of public interest in specific school results.

This evidence of poor resource allocation in our nation's schools is cause for concern since, despite Levin's (1997) contention that reallocation of resources is not the way to greater efficiency gains, there is a great deal of research to demonstrate that specific resource allocation patterns are tied to greater student achievement. Rubenstein (2000), for example, found that higher performing schools "tend to allocate a larger share of their discretionary resources for instructional purposes...." Linda Darling-Hammond (1997) found that schools that reallocated existing staff, expanded staff development, and reduced class loads were able to increase student achievement. Likewise, Weglinsky's (1997) study found that lower teacher-student ratios resulted in higher math achievement in fourth and eighth graders. All of these studies seem to support the conclusion of Odden and Clune (1995) who found that low productivity in schools was tied, not to wasteful administration or high teacher salaries, but to poor resource distribution and unimaginative use of existing resources. Odden and Archibald (2001) build on this notion and describe in great detail how some schools have managed to improve student achievement without asking for more money. However, the authors admit that to achieve the ambitious goals of NCLB may not be possible under current funding levels.

Despite the poor track record for resource allocation observed by researchers to date, there is cause for hope. The heightened accountability environment created by NCLB may very likely change this situation. Politicians are increasingly using education to garner votes. Whether or not increased accountability will lead school leaders to make more informed decisions concerning resource allocation is yet to be seen. However, even casual observation of school decision making since NCLB provides anecdotal evidence that the basis for resource allocation choices are changing. In Pennsylvania schools this author has observed more consistent discussion of ways to improve student performance

on the PSSA coupled with scrutiny of existing resource allocation patterns. High school principals, in particular, are taking seriously the public scrutiny of published test scores even if they do not fully embrace the instrument (PSSA) being used to measure their effectiveness. New courses are being developed, thus shifting resources. New teaching positions are being created. Workbooks are being purchased. Tutors are being hired. However, such decisions are still piecemeal and are not driven by a comprehensive model for resource allocation thus proving what Allison (1971) suggested, that administrators are simply making decisions to satisfice as opposed to optimizing student learning. One of the goals of the proposed study is to contribute toward making administrators more aware of the importance of connecting resource allocations to planned educational goals.

The Ingredients Approach to Cost Estimation

Every intervention aimed at raising test scores requires resources that must be directed to the intervention goals and away from other school goals. Thus, the true "cost" of an intervention is the value of the resources it draws from other purposes. As Levin and McEwan explain:

"Economists define the cost of an intervention as the value of all of the resources that it utilizes had they been assigned to their most valuable alternative uses. Defined in this sense, all costs represent the sacrifice of an opportunity that has been forgone. It is this notion of opportunity cost that lies at the base of cost analysis in evaluation" (Levin & McEwan, 2002).

It is not an easy task to place a value on these "opportunity costs." However, one common method for doing so is the "ingredients method." The summary of this method that follows is drawn from the work of Levin (1983) and Levin and McEwan (2001). The ingredients approach to estimating costs requires the analyst, wishing to determine the cost of an intervention, first to identify all of the ingredients used and then to determine a value for each ingredient. Five main categories for ingredients are recommended: personnel, facilities, equipment and materials, client inputs, and other inputs. The first three categories are self-explanatory. "Client inputs" in this study would refer to

contributions made by students and their parents. "Other inputs" are ingredients that do not fit easily into another category such as heating, additional insurance costs, or Internet service. A Cost Worksheet is the instrument used to record and analyze these ingredients and their costs.

The cost worksheet identifies two important pieces of information. First, it identifies the cost for each ingredient. Second, it identifies the constituent that bears each cost. They are listed at the top of the worksheet. Once all of the ingredients have been identified, the next step is to place a value on them. Here Levin makes several recommendations. For those ingredients with market prices, this becomes the best measure of cost. This approach is based on simple supply and demand economic theory. Since there are competitive markets for many of the ingredients, such as equipment and supplies, this approach makes sense. However, in some cases there are no competitive markets or there is no market at all for a particular ingredient. Where no market price is available a shadow price must be determined. For example, in the proposed study, no market value exists for valuing the time faculty dedicated to scoring student work at home. Here it is necessary to ask what the price would be if there were a market for such work. The cost for homebound instructors, for example, might provide a meaningful shadow price for determining the cost for teachers working at home to score papers.

In a study which spans more than a single year it is also necessary to consider the effects of inflation. The costs of ingredients must be equalized since dollars spent in earlier years purchase more than dollars spent in the final year of an intervention. Typically, all costs are adjusted to the price levels of a specific year based on the average Consumer Price Index. Another consideration for multi-year interventions is the need to discount future costs. In a three year project such as the one in this study, money spent in the first year is no longer available for investment. Thus, from a taxpayer's point of view, costs in the last year of the project are less of a burden than those in the final year. This can be understood more clearly by recalling that, in cost analysis, cost is defined as the value of opportunities lost. Thus, costs born in the first year of a project require schools to give up more opportunities than costs in the final year.

After all ingredients are identified and valued, two additional cost adjustments must be calculated. These involve those costs, users fees and cash subsidies, that do not change the overall cost of the intervention, but rather change the distribution of costs among constituents. User fees include any charges paid by participants to be involved in the intervention. For example, the school might charge students a fee for use of the computer lab after school hours. These fees represent a cost to parents but a revenue to the school. Thus, this amount would be added to parent's cost and deducted from the school's cost. A similar approach is taken to adjust for cash subsidies, such as a state grant, received by the school. These represent a cost for the state agency and a revenue for schools. Again, they reduce the overall cost for the school or school district.

Local school budgets do not possess sufficient specificity (Chambers, 1999) to conduct a cost analysis. Levin details specific problems with relying on the school budget to analyze costs. First, the budget does not include costs born by other constituents such as volunteers, "in-kind" resources, or other donated resources. Second, the budget does not permit specific analysis of resources provided by other agencies such as other governmental organizations. Third, budgets do not represent an accurate cost for major projects such as construction since these costs are not amortized. Fourth, intervention costs are often embedded in a larger expenditure. For example, the cost of equipment for a computer lab that is only partially used for the intervention is not separated by different purposes. Last, the budget is a planning document and does not reflect what was actually spent. Thus, the budget is only one source of information in a cost analysis.

Since the budget cannot be the sole source of information for determining ingredients, other sources must be analyzed. Interviews of intervention participants, direct observation of the intervention, and a thorough review of all documents related to the intervention are sources that can be used to identify all of the ingredients. Interviews are especially critical for estimating consumption of supplies such as paper, printing, and related materials. Naturally, estimates of the time devoted to intervention activities were critical to obtaining an accurate estimate of costs.

Concentric Circle Model

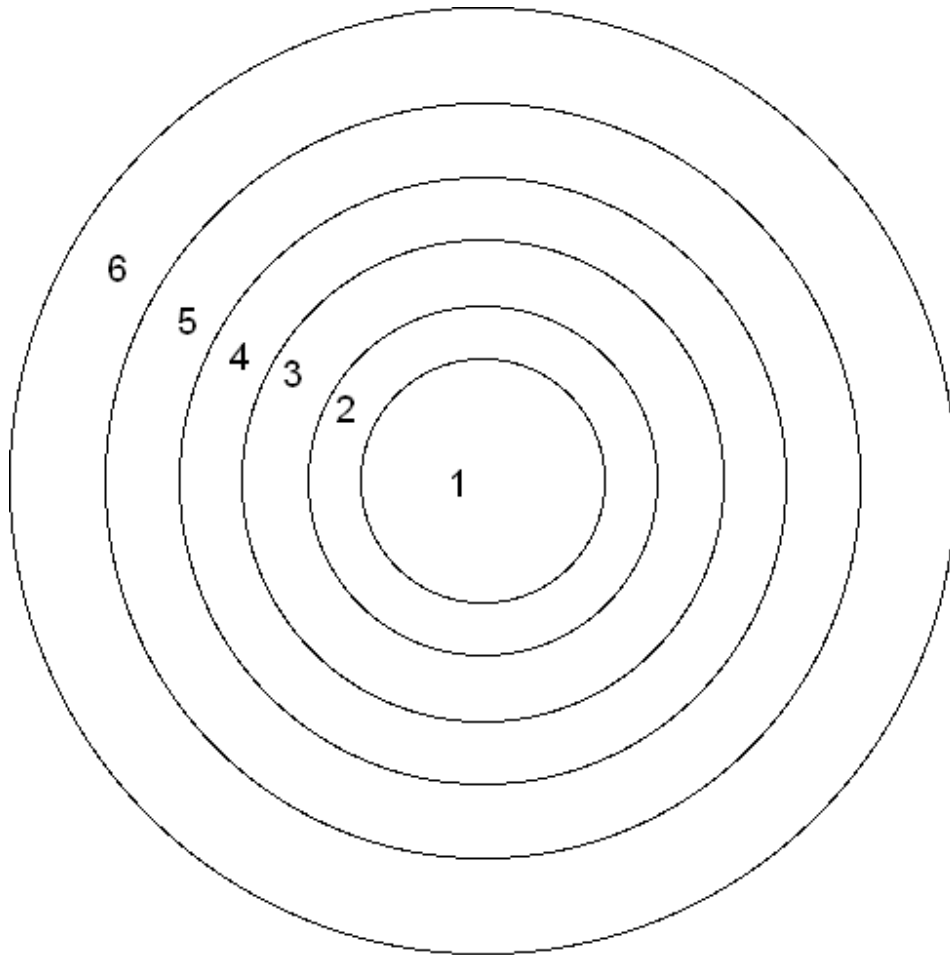
Any school budget is, in essence, a reflection of the values of those who develop it. The Concentric Circle Model (Hartman, 1992) permits schools to place a value on school expenditures as a means of analyzing possible budget reductions. Six categories of school expenditures are used to classify resources and activities. These categories, illustrated in Figure 1, are: 1) Teacher and Students in Classroom, 2) School-Based Instructional Support, 3) School-Based Operational Support, 4) District-Level Instructional Support, 5) District-Level Operations Support, and 6) Other District Programs.

Activities and resources which are closest to the core mission of the school occupy the center circle identified as number one. Those in the outer circles are furthest removed from the core mission. Thus, teachers and students are placed in the center circle and programs such as maintenance and transportation occupy outer circles. Distance from the center circle does not indicate that a budget item is not essential, only that it is removed from the central classroom activity.

The CCM can assist a school board in analyzing a budget and examining more intentionally the values inherent in that budget. Typically, the model is used to examine proposed expenditures before building a budget. Thus, administrators may decide that an expenditure in an outer circle might be removed so that funds can be reallocated to a programs or service more directly related to instruction in the Circle 1. For this study, the CCM was adapted to examine resource allocation patterns after the fact. Once the final ingredients of the intervention were identified, they were classified in the same way as expenditures. In this case, rather than using the model to inform decision-making, it was used to evaluate previous decision-making. Additionally, costs born by other constituents were examined and classified based on their distance from classroom instruction.

Figure 1

Concentric Circle Model



- 1-Teacher and Students in Classroom
- 2- School-Based Instructional Support
- 3- School-Based Operations Support
- 4- District-Level Instructional Support
- 5- District-Level Operations Support
- 6- Other District Programs

Reprinted from Hartman, W. T. (1992) *Public School Finance*, University Park, PA: The Pennsylvania State University, pg. 44.

CHAPTER 3: METHODOLOGY

Introduction

The primary purpose for this study was to examine costs associated with one school's attempt to raise student achievement in reading and writing as measured by the Pennsylvania System for School Assessment (PSSA). In concept, conducting a cost analysis is straightforward and consists of two basic steps: identifying resources directed toward the intervention and assigning costs to each resource. However, in practice both of these steps become more complicated. Several methods for conducting cost analyses have been developed. The ingredients approach, as described by Levin & McEwan (2001), was selected as the most appropriate approach to determine actual costs for this intervention and is described in more detail below as it was applied to this study.

After providing some brief background information on the school setting for this intervention as well as an overview of the intervention itself, the specific steps for calculating the cost of the intervention are presented. In addition, since the success of the intervention is to be gauged by student performance on the PSSA, methods for compiling and analyzing this test results will be discussed. Finally, methods for analyzing resource allocation patterns, using the concentric circle model, will be explained and applied.

The School

The school district under study, which for purposes of this study is given the fictitious name of Liberty School District, is situated in a college town of approximately 7000 residents. The annual school district budget is \$10.2 million and is composed of Liberty Junior-Senior High School (LJSHS), the subject of this study, which serves approximately 455 students in grades 7-12, and is fed by a single K-6 elementary school of about 480 students. LJSHS provides an academic curriculum wherein virtually all students take the same social studies and English courses through their sophomore year. Only students with disabilities, who take core subjects in the special education resource room, would be exceptions to this policy. Thus, while about 10.5% of students 7-12 are students with disabilities, about 5% take courses in the resource room.

The typical LJSHS graduating class is seventy-five students. On average, sixty-three of these students continue to post-secondary schooling with the remainder entering the armed forces or the work force. Twenty-one percent of LJSHS students in grades 7-12 qualify for the federally supported free and reduced lunch program for low income families. At the time of the study between 30-35 students in grades 9-12 attended the local vocational school during any given year. In 2003 the Pennsylvania Department of Education website [PDE, 2005] recorded the LHS student population as 94% white, 2.2% Asian/Pacific Islander, 2.1% black, 0.8% Hispanic and 0.4% American Indian/Alaska Native. This same website placed Pennsylvania's number of students with disabilities at 13.3%.

LJSHS students have always performed well on standardized tests with average Scholastic Aptitude Test (SAT) scores exceeding state and national norms. For both the SAT and the PSSA, the junior-senior high school was at the top of the seventeen schools in its Intermediate Unit for the years 2001 through 2004. Liberty Junior-Senior High School is known locally for its outstanding participation rate. In addition to sports, the arts enjoy unusually high involvement. The marching band, for example, regularly attracts more than one hundred members. The Art program boasts many students who are accepted into Pennsylvania Governor's School each year. The school also supports a show choir group which, unlike many area schools, involves many athletes as well as music majors. Perhaps parents best express the climate at LJSHS when they proudly proclaim, "It 's O.K. to be smart at Liberty School District."

The Intervention

By the end of the 2000-01 school year, the Pennsylvania System for School Assessment had already begun to focus the attention of Pennsylvania school administrators on raising test scores. Anticipation of the No Child Left Behind Act and its proposed sanctions served to heighten this concern. Thus, in seeking to replace a retiring English teacher, the LJSHS principal learned of the availability of a curriculum specialist looking to leave the local Intermediate Unit to return to the classroom as an English teacher. With her hiring in June 2001, the high school principal began to discuss the need

to develop curricula and classroom strategies to insure that students were able to perform well on the PSSA. This teacher, hereon to be called the Lead Teacher, recommended a series of strategies which could help to raise student achievement in reading and writing. These strategies, which were implemented in all of the Lead teacher's seventh classes during the 2001-02 school year, included:

- implementation of quarterly assessments in reading and writing
- use of the PSSA rubric to score these assessments
- deconstruction of the PSSA exams to aid in the development of assessments
- teaching students test taking strategies
- Expanded feedback to students based on the PSSA rubric

Implementation of these strategies (August , 2001) marked the beginning of the intervention. The quarterly assessments implemented by the Lead Teacher consisted of reading and writing assessments which were scored using the same four point rubric as that used for the PSSA. The format of these assessments also mimicked the PSSA. The results of these assessments were used both as a local district assessment as well as a grade for each student. Seeing the improvement in assessment results after implementation of these strategies, the high school principal decided to implement them throughout the English curriculum in grades 7-12. However, noting the labor intensiveness of reviewing, scoring, and providing feedback for these quarterly assessments, the principal decided that expansion of the English Department would be required for successful implementation. This determination was based on three related assumptions:

- improving a student's reading and writing performance required practice with feedback.
- a teacher supporting seventy-five students could deliver more complete and specific feedback to students, and do it more often, than a teacher supporting ninety students.
- increasing the specificity and frequency of feedback would enhance student performance both in the classroom and on standardized tests such as the PSSA.

The opportunity for expansion came when another English faculty member announced her retirement in January 2002. At this time the principal requested, not only replacement of the retiring teacher, but also the hiring of an additional English teacher to facilitate the implementation of the strategies employed by the newly hired Lead Teacher. This additional teacher was approved in February 2002 and began work in August 2002. Although all three of the English faculty hired in 2001-02 were veterans, this fact was not in response to intervention needs but rather reflected a long time hiring practice of the district to secure the most talented teachers available. Obviously, by hiring teachers who were placed at the top of the salary matrix, the district forfeited any potential savings that could have been accrued by hiring teachers at the entry level.

Expansion of the English Department by one member resulted in average class loads for teacher of seventy-five (75) students for all required English classes. Previously, teachers had carried class loads of over ninety students for core courses. Teachers in grades 7-10 taught between 70-80 total students and taught only core, required English courses. However, the two teachers serving eleventh and twelfth grade, due to other electives, experienced teaching loads of between 85-90 students for each of the three years of the intervention. Their teaching load for the core courses they taught were still at or below seventy-five students.

In addition to reduced student loads, every English teacher was scheduled for at least one additional planning period per day. Beginning in August 2002, the Lead Teacher was scheduled with four "curriculum" periods per day wherein she was able to work with other faculty to improve instruction and assessment in reading and writing. This work involved helping English teacher's implement strategies to raise PSSA scores. Since, at the time of the intervention, Pennsylvania permitted students with Individual Education Plans (IEPs) to graduate under this plan, and because the learning resource teachers were involved with other training aimed at raising student performance in reading, only those special education students placed in regular classrooms were exposed to intervention strategies. This meant that between 3-5 students per class who took English in a separate resource room were not involved directly in the intervention.

Beginning in June 2002, the Lead Teacher conducted training for all other English faculty including the additional faculty member. This permitted quarterly assessments in Reading and Writing could be conducted at every grade level. Training and assistance continued as needed through June 2004. Much of this training was individualized and took place during planning periods within the regular school day. Beginning in the 2002-03 school year, all English teachers were required to conduct one assessment in Writing and Reading during each grading quarter. These assessments were scored with the same rubrics used by the state for the PSSA Writing and Reading exams. Since each English teacher began the 2002-03 school year with a different level of knowledge and skill in preparing students to perform well on the PSSA Writing and Reading exams, some of the early local assessments were conducted before all faculty had been fully trained. This was accomplished by having the Lead Teacher assist with developing and scoring the assessments for some faculty.

In addition to implementing quarterly assessments, English teachers were instructed on how to incorporate additional writing into lessons. This writing instruction included strategies for familiarizing students with the Pennsylvania five domain scoring rubric for Writing. No effort was made to monitor or control the amount or type of writing in each grade beyond the required quarterly multi-draft paper scored using the PSSA rubric. Thus, the amount and nature of writing assigned to students beyond the required intervention activities varied from grade level to grade level. Results of quarterly assessments were reported to the board of education. This report indicated the number of students at each grade level scoring at each of the four performance levels for the PSSA. Results were released each quarter for reading and writing .

Teachers also learned test taking strategies which were incorporated into their lessons so that they could be taught to students. For example, the Lead Teacher analyzed the PSSA reading exam and determined that the scoring rubric paralleled Bloom's taxonomy. In other words, in the written portion of this exam, the highest score of four would be received if the student gave supporting evidence which demonstrated mastery of four domains, namely knowledge, comprehension, application, analysis and synthesis.

Thus teachers were trained to understand these domains and instructed on how to help students to include them in their written responses to the reading exam. In addition, the Lead Teacher, using released reading PSSA items, deconstructed the stem portion of multiple choice questions. These question stems were distributed to faculty so that they might be included both on local assessments as well as on other classroom assessments.

In summary, the intervention under study consisted of the following steps:

- 1) Hiring of a veteran teacher with expertise in standards and assessment
- 2) Expansion of the English department by one faculty member, which reduced class loads from ninety (90) to seventy-five (75) students in core English courses.
- 3) Implementation of quarterly assessments in reading and writing which employed the same scoring rubric used by Pennsylvania for the PSSA
- 4) Training for teachers in the use of the scoring rubrics for both the writing and reading PSSA and in strategies for incorporating reading and writing in their lessons.
- 5) Training for all students in understanding the state's scoring rubric for both the reading and writing PSSA. This included thorough familiarity with the five domains of writing. In addition, specific strategies were taught for responding to prompts on the written portion of the reading PSSA.
- 6) Acquisition of resources to aid in PSSA preparation such as workbooks and locally developed reading assessment tools.
- 7) Recording, storing, reporting and analyzing local assessment results.
- 8) Analyses of the writing and reading PSSA.

It is important to note that, in calculating the time devoted to intervention activities, the focus was on activities directly related to improving PSSA results. Although some activities were aimed at enhancing writing skills, this instruction, it was determined, would have been conducted in the absence of NCLB. The critical added

tasks were directed specifically at learning the Pennsylvania PSSA rubric, scoring papers using this rubric, and having students rehearse test taking strategies quarterly.

The Intervention Subjects

Liberty School District is composed of two buildings; a single K-6 elementary building and a single 7-12 junior-senior high school building. The intervention efforts examined in this study were implemented at the junior-senior high school. All students in the junior-senior high school were exposed to the intervention strategies with the exception of those students who received their English instruction in a learning resource room. Although this number varied from class to class, students with disabilities taking English in the learning resource room accounted for roughly five percent of all students in the building during any given year. Thus, during any given year of the intervention, approximately 435 students out of 458 benefited from intervention activities.

Despite the fact that almost all students in grades 7-12 were exposed to intervention activities, and for reasons explained below under "Analyzing Intervention Effect", it was only feasible to assess the performance for those in sixth grade or junior high at the time of the study. Thus, for purposes of assessing the impact of the intervention, only the performances of students in grades 6-9 during the initial year of the study were considered.

Subgroups

NCLB requires that all subgroups make Adequate Yearly Progress (AYP). In other words, each subgroup must meet the targets established in Table 1 above. As discussed earlier, Pennsylvania reports scores for the following subgroups: gender, disability, socioeconomic class, and race. However, for LJSHS, only two of these subgroups were large enough to be reported on the Pennsylvania Department of Education website. This website (PDE, 2005), which reports the scores for all of the state's 501 school districts, only reported LJSHS scores for the subgroups of gender and disability. Thus, when measuring the effect of the intervention only these subgroups were considered. However, since individual data were not reported prior to 1999, it was not

possible to examine individual data for these subgroups for those years. Although students with disabilities were a small subgroup, identifying their performance and any additional costs for raising their scores is important. Critics of NCLB frequently point to the large cost for raising these students to proficiency as a major obstacle to success. Thus, it is useful to determine what, if any, additional resources were used to attempt to raise their PSSA test scores. Although gender should not have presented a special cost factor, where possible, scores were examined by gender to identify any disparity in intervention effect.

Analyzing Intervention Effect

If the cost results of this study are to be useful in making future resource allocation decisions, some measure of intervention effect is necessary. This was accomplished through comparison of PSSA scores to identify and quantify any change in performance between scores reported before and after exposure to the intervention. In other words, between fifth and eighth grade, for Reading, and between sixth and ninth grade for Writing. Two types of data, which for purposes of this study will be referred to as "Group" and "Individual", were available.

As explained above, Pennsylvania did not report individual student scores during the years when Groups A and B were tested in fifth and sixth grade. At that time, results were reported as the number of students scoring within each of the four performance levels. Thus, it was not possible to track the change in performance for each student. As a result, for Groups A and B, analyses were limited to comparing the change in the number of students scoring at each of these four performance levels between testing in elementary school and junior high school. Naturally, the composition of Groups A and B changed during the three years that elapsed between elementary school and junior high school as students moved in and out of Liberty School District. Thus, those students in Group A that took the fifth grade Reading PSSA were not the same as those that later took the Reading PSSA in eighth grade.

Fortunately, a more precise comparison was possible for Groups C and D since individual students scores were available for each year of testing. This made it possible to track the change in performance of each student who was in continuous enrollment from the beginning of fifth grade through testing in ninth grade. For this analysis, only those students whose enrollment was not interrupted during the study were included in the comparison. "Group" results are reported for all of the four classes that participated in the study. Individual results are reported only for Groups C and D.

Determination of the student groups for which test scores were collected was dictated by changes in the way PSSA results were reported. As discussed above, due to privacy concerns, individual student scores were not reported to schools prior to the year 2000 in Pennsylvania. This meant that, for all those students who took the PSSA as juniors during the interval of the intervention from 2001 through 2004, no individual data from previous years (i.e. fifth grade, sixth grade, eighth grade or ninth grade) were available for comparison. Thus, the decision was made to focus on students who were in grades 6-9 during the initial year of the intervention. It was thought that this selection provided useful comparisons because many of these students would have individual data available with which to more easily track changes in performance. Students who were in sixth grade during the initial year of the intervention (2001-02) would have individual data from their reading PSSA taken during fifth grade (2000-01) and from their sixth grade writing PSSA. All of these test results would occur before these students had been exposed to interventions at the junior-senior high school. Once entering the junior high, this group of students had maximum exposure to intervention activities before taking their reading PSSA in eighth grade and their writing PSSA in ninth grade.

Those students already in seventh grade during the initial intervention year also had individual reading and writing data available from fifth and sixth grade. Thus, this seventh grade class provided valuable pre-intervention data for reading and writing and experienced maximum exposure to the intervention before testing in eighth and ninth grade. While those students in sixth and seventh grade during the initial year of the study received maximum exposure to the intervention before testing, those in eighth grade

received somewhat less exposure and those in ninth grade class received no exposure to reading intervention before testing and only two months of intervention before taking the writing PSSA. This group was selected for comparison purposes as a control group. Table 2 below summarizes the amount of exposure to intervention strategies before PSSA testing for each grade level analyzed for intervention effect.

Table 2

Exposure to Intervention			
Group	Starting Grade August-01	Months of Reading Intervention	Months of Writing Intervention
A	9	0	2
B	8	7	11
C	7	16	20
D	6	16	20

As Table 2 shows, each group of students was labeled according to the grade level they were in at the start of the intervention activities. For example, Group D was in sixth grade at the start of the study. It is important to note that interventions were introduced in seventh grade in August 2001 and were not fully implemented into other grade levels until August 2002.

To understand how the intervention effect was analyzed it is necessary to understand how scores are reported for the PSSA and how this reporting has changed. In Pennsylvania, during the time of this study, the reading PSSA was given in the spring of each year and the writing PSSA was given in the fall of each year. On the reading exam students were asked to read several short passages. They then responded to multiple choice questions and to a single writing prompt for each passage. On the writing PSSA students responded to three writing prompts which cover informational, persuasive and narrative forms of writing. For both assessments, scores were reported to schools using a four point scale. On this scale a score of four (4) is required for advanced performance, three (3) for proficient performance, two (2) for basic performance and one (1) for below basic performance. A score of zero (0), indicated that a student did not respond.

Schools received the results for the writing PSSA in the spring of the following year in which it was given. Scores for the reading exam were reported to schools in August or early September of the year in which it was given. During the interval in which this study was completed, between 2001-2004, individual student scores were reported for all PSSA exams. In addition, schools received individual and composite results for the following subgroups: gender, disability, socio-economic class, and race. However, as mentioned above, prior to 2000 concerns over confidentiality prevented the reporting of individual students scores. This meant that, for groups A and B, individual data were not available for their fifth and sixth grade PSSA results.

Standardizing Test Results

Further complicating analyses of PSSA was the fact that, during 1998-1999 scores for the writing exam were not reported using the current four point rubric. In 1998 and 1999, when Groups A and B took their sixth grade writing PSSA scores were reported to schools on a scale which included five performance bands labeled "Excellent", "Good", "Fair", "Weak", and "Poor". (See Appendix B) This scale was based on raw scores which represented a possible range of two through twelve. Students were assessed on three forms of writing including narrative, persuasive and informational. For each individual student, scores on these three forms of writing were averaged together to obtain a final composite score. A score of seven out of twelve points was considered the lowest score a student could attain and still be considered competent. This score of seven (7) on the earlier writing PSSA is the key to permitting some comparison of scores for Groups A and B. By equating a score of seven (7) on the 1998-99 PSSA, to the "proficient" score of three (3) used between 2000-2005, a conversion table was constructed. Scores within the range from two through twelve were then calibrated to the current scoring system as shown in Table 3 on the following page.

In summary, to assess the effect of the intervention, scores from the 5th grade reading PSSA and the 6th grade writing PSSA, taken before the intervention, were compared to scores on the 8th grade reading PSSA and 9th grade writing PSSA, taken after the intervention was implemented. Where individual student data were not

available, such as for groups A and B, analyses were limited to determining the net change in the percentage of students scoring at each performance band between 5th grade and 8th grade for the reading PSSA and between 6th and 9th grade for the writing PSSA. This analysis was also conducted for groups C and D. Where individual data were available, for Groups C and D, the change in performance for individual students was charted and reported as "individual" results.

Table 3

Conversion of Pre-2000 PSSA to Post-2000 Format	
1998-99 Raw Score	Four Point Scaled Score
10-12	4 Advanced
7-9	3 Proficient
4-6	2 Basic
1-3	1 Below Basic

Calculating Costs

The ingredients approach, as described by Levin & McEwan (2001), was adapted and used to determine actual costs for this intervention. Ingredients from five general areas were examined including personnel, facilities, equipment and materials, client inputs, and other inputs. "Other inputs" is a catch-all category which, for this study, included utilities. The study paid particular attention to "subtle" (Monk & King, 1993) costs. A critical subtle cost in this study was the cost born by teachers for working out of school hours to complete intervention tasks. An important first step in conducting any educational cost analysis is accurate and complete identification of all component costs. Only those costs directly related to the intervention are to be included in the final inventory of costs. (Levin & McEwan, 2001). The cost worksheet shown in Table 4 below lists all of the ingredients identified for this study. Costs were separated according to the constituents bearing them including: school district, federal government agencies, and administrators and teachers.

Data Collection

As prescribed by Levin & McEwan (2001), interviews supported by other documents were used to estimate costs. Teachers were interviewed to estimate the hours

they worked and the amounts of various resources used pursuing intervention activities. Their responses were supported with other records including logs, lab sign-up records, lesson plans, student portfolios, custodial supply request records, and review of current resource utilization records.

Table 4

Sample Cost Worksheet				
Intervention Categories	Cost to State & District	Cost to Federal Govt.	Cost to Teachers & Admin.	Row Totals
Personnel				
Add'l English Teacher				
Existing English Teachers				
Lead Teacher				
Administration				
Substitutes				
After School Training				
Teacher "After School" Work				
Administrator "After School" Work				
Facilities				
Classrooms				
Writing Lab				
Library				
Office				
Materials & Equipment				
Computer Equipment				
Printer Cartridges				
Paper				
Workbooks				
Other Inputs				
Utilities				
Totals				

Identifying costs required analyses that went beyond examining the school budget. In addition to interviewing participants, the following documents were reviewed to corroborate estimates:

- * Budget and payroll records
- * Checks and invoices (equipment, supplies)
- * Audit reports (equipment costs)
- * Conference requests (conference requests and training)
- * Annual personnel cost reports (personnel)

- * Reimbursement forms (conference requests and training)
- * School Policies
- * Lesson Plans (personnel costs due to time on intervention)
- * Custodial Supply Requests (supply costs)
- * Lab sign-up records (lab costs)
- * Work logs (time spent on intervention)
- * Bid specifications and feasibility study (facilities)

Sensitivity Analysis

An element of uncertainty is inherent in all cost analyses. Assumptions, incomplete data, errors in costs calculations or even cost adjustments, are all potential sources of uncertainty. To address these uncertainties, this study borrowed cost analyses techniques from the health and medical fields. Specifically, the use of sensitivity analysis as discussed by Hummel-Rossi & Ashdown (2002) was used to frame the final cost estimates.

Sensitivity Analysis (SA) is the tool used to address concerns of uncertainty in cost analyses. In SA, costs are bracketed so that a range of costs can be tested and the results are reported in a manner similar to confidence intervals used in statistics. In bracketing, professional judgment is used to identify the high and low estimates for those variables which most impact the overall cost analysis and which introduce a high degree of uncertainty in the overall cost analyses. These high and low figures are then used sequentially in the cost analyses to provide a more meaningful interpretation. This process increases the confidence that the true intervention cost has been captured. In this study, estimates for the hours each teacher devoted to intervention activities was a key variable contributing to uncertainty in the final cost calculations. A best estimate was made for the time teachers devoted to intervention activities based on interviews of the faculty involved. Although the estimate for teacher time impacted several costs including personnel costs, facility costs, and utility costs, SA was used to bracket personnel costs only. This process is described in more detail below under the discussions for "In-School Personnel Costs" and "After-School Personnel Cost."

Cost Adjustments for Inflation

The final costs for the three year intervention were adjusted for inflation. Costs were expressed in terms of "real" 2005 dollars. This was done using the average Consumer Price Index (CPI) for each fiscal year of the intervention. To calculate the CPI for each school year, the CPI for the months of each fiscal year from July 1 through June 30 were averaged. Table 5 shows the CPI for each year. The CPI for the 2005 Base Year was an average of the monthly CPI for that year.

Table 5

Consumer Price Indices	
Year	CPI
2001-02	178.91
2002-03	181.96
2003-04	187.25
Base Year (2005)	196.8

The costs recorded in the cost worksheet represent costs adjusted to 2005 dollars. The formula used to adjust for inflation was:

$$\text{CPI 2005/CPI [year]} \times \text{Dollars Spent [year]} = \text{2005 Dollars}$$

In-School Personnel Costs-Instruction

The work of the Lead Teacher represented the first cost for the intervention. The hiring of an additional faculty position established during the 2002-03 school year also represents a cost for the intervention. However, other personnel costs were also incurred. Although five of the six English faculty positions existed before the intervention began, some of the instruction and duties required of faculty during the 2001-02, 2002-03, and 2003-04 school years, displaced traditional instruction. Calculation of these costs began with teacher interviews for the purpose of estimating the hours each teacher dedicated to activities directed solely at enhancing student performance on statewide testing. The researcher, working with faculty, first identified a list of specific activities which were unique to the intervention. These activities for English faculty included:

- Planning local assessments
- Developing assessment tools
- Developing data collection instruments
- Training
- Instruction of students
- Administering, scoring , recording, filing, and reporting assessments

In addition to the duties above, the Lead Teacher also analyzed PSSA items and supervised implementation of the interventions.

Once a list of intervention activities was established, each teacher, drawing upon logs kept by the Lead Teacher, writing lab sign-up logs, lesson plans and the administrator's log, estimated the time committed to each activity during any given year. Once time estimates were obtained, the cost associated with this time was calculated using the school's annual report of personnel costs, published by the business manager. Based on the yearly salary and benefits for each instructor, a pro rated hourly salary was calculated using a 184 day instructional year. The final cost was the product of these two figures. An Intervention Log (See Appendix A) was created to summarize the major events of the intervention and to help identify resources.

As discussed earlier, sensitivity analysis was used to bracket personnel costs. Since estimates of the time each teacher committed to intervention activities represented the critical variable in calculation of teacher personnel costs these time estimates were bracketed to insure that the actual time commitment was captured. These high and low time estimates were based on professional judgment of the researcher and each teacher as to the minimum and maximum time required to complete each required intervention task. In estimating the minimum time estimates, faculty referred to assignment records, sign-up logs for the writing lab and library, and to enrollment data. Use of facilities such as the library and writing lab were straightforward since logs were available. Estimates of the time required to plan lesson, develop materials, and to grade student work, presented a larger margin for uncertainty. Enrollment data were useful in determining the time required to score student work since a per student estimate could be determined and multiplied by a teacher's total enrollment. Teachers were asked to make a "best estimate"

of their time commitment based on the documentation available to corroborate their judgment. These estimates represent the times recorded in the log in Appendix A. This time estimate was bracketed for each of the three years of the intervention. For each year, the teacher with the lowest and highest time estimate was identified. These estimates were then applied to all other faculty and in-school personnel costs were recalculated using these figures. The time estimates for the Lead Teacher were not bracketed in this fashion because she maintained a very accurate log. This log had been recommended during her hiring since there was concern that the district could not afford preferred scheduling within its English Department. Thus, the Lead Teacher was asked to maintain a log of activities and time. For this reason, it was determined that bracketing her time estimates was unnecessary.

As was discussed earlier, while students in grades 7-12 benefited from intervention strategies, only scores from those students in grades 6-9 were used to assess the impact of these strategies. Thus, the costs for these students were broken out and reported separately in Chapter 4.

After-School Personnel Costs-Instruction

Additional hidden personnel costs were calculated based on the time each teacher worked outside of contractual hours to accomplish intervention goals. The bulk of this time was devoted to assessment activities such as reviewing and scoring papers or developing rubrics and assessment tools. These estimates were calculated in the same manner as those made for in-school time estimates. These costs were based on each teacher's estimate of the time required to score an average student paper for each given assignment, multiplied by the number of papers assigned per year. Teachers reviewed their lesson plans from previous years as well as their enrollment figures in making these estimates. As with in-school time, after-school time was also bracketed. As with in-school costs, after-school costs were also broken out for those directly associated with the students used to measure intervention effect.

Personnel Costs-Administrative

Although the district employed a building principal before the intervention, implementation of this intervention required administrative time both during and after school hours. For the principal, this time included conferences with the Lead Teacher, review of assessment data, planning and conducting meetings with faculty, reporting data, and curriculum and supervision duties specific to the accomplishing the intervention. To calculate this cost, an estimate of the time dedicated to implementation of the intervention for each of the three years was prepared. The administrator's personal log was a key source for validating these estimates. The administrator's hourly pro-rated salary and benefits was calculated based on payroll records. This hourly rate was applied to the total number of hours committed to the intervention to determine costs. The same hourly rate was used to calculate cost for both in-school and out of school time. Since administrative time was a small variable in the overall cost, no bracketing was performed.

Facility Costs-Classrooms

Six classrooms, a writing lab, the school library, and a conference room were used for planning, instruction, testing and other intervention activities. Levin (2001, pg. 66) suggests several methods for identifying a cost for facilities including using rental and lease fees from similar spaces or determining replacement cost. Most of the spaces used in this intervention were of recent construction. Several documents were available which permitted estimation of their replacement cost. In addition to the original feasibility study, a construction file, which included all invoices billed to the construction project, was available. Review of these documents permitted estimation of a per square foot cost for the six classrooms as well as the writing lab and library. The final estimated per square foot cost for the four new classrooms was also used as the cost estimate for the two existing classrooms.

The steps involved in calculating the cost for facilities are summarized as follows:

1. Calculation of the cost for new construction for 43,500 square feet
2. Average cost over 40 year useful life to determine yearly cost
3. Adjust yearly cost for inflation for each year of the intervention

4. Calculation of yearly cost for each space based on per square foot cost
5. Calculation of an hourly rate for each space
6. Final cost is the product of the hourly cost per space and the utilization time

Since this project was reimbursable under Pennsylvania regulations, the district and government shares were calculated based on the 40% reimbursement rate. Adjustments were made in estimating this cost. A portion of the construction cost was used to renovate existing classroom space. Thus, it was first necessary to parcel out those costs for renovating existing spaces and to subtract them from the total construction cost to arrive at the cost for new construction. Since Pennsylvania state accounting procedures recommend a forty year useful life for new construction, the total new construction cost was averaged over forty years. This yearly cost was adjusted for inflation to obtain the cost for each year of the intervention.

Using the yearly cost, a cost per square foot for new construction was calculated based on the total square footage of new construction (43,500 square feet). The cost for construction of the writing lab and library was slightly higher than that of the classrooms due to additional cost for technology infrastructure. However, this cost was estimated to account for less than one percent of the cost per square foot in these rooms. Thus, a single cost per square foot was used.

An hourly cost for each space was calculated based on a 184 day school year and a 6.5 hour school day for faculty for a total of 1196 hours per year. This was necessary since the final cost for facilities was a function of the hours each faculty member used each space for intervention activities as identified in the Intervention Log. Based on the square footage in each room, the per square foot cost was used to determine the yearly cost for each space. This cost was then divided by the 1196 hours in each school year to determine an hourly cost for each space.

Having calculated the per hour cost for each space, the final step in determining facilities costs was to determine, from the Intervention Log, the "best estimate" for in-

school time each space was used for intervention activities. The product of these time estimates and the per hour cost for each space provided total costs for the four spaces used during the intervention. These best estimates for time for each teacher were used for the initial cost calculation for facilities.

Supplies

Although a small part of the overall intervention, the cost for supplies was calculated through estimates based on the number of assessments per quarter, the number of students, the average length of assignments, and the number of drafts. The supplies examined were paper, ink cartridges for the lab and classroom printers, and PSSA workbooks which were purchased for all grade levels. First, paper consumption was estimated for both the lab and classroom. The cost per case of paper was adjusted for inflation before calculating the per ream cost. The cost for printer cartridges was based on the reams of paper consumed. A cost of one cent per page was estimated based on utilization records. Costs were adjusted to 2005 dollars.

During the 2002-03 school year sufficient workbooks were purchased to permit each grade level to share use within their classrooms. Thus, a total of seventy five workbooks were purchased at a cost of \$29.95 each. The total cost was \$2246.25. This was paid for by federal Title V funds.

Equipment

Computers and printers were used throughout this intervention. In addition to student use during writing, faculty members used their computers to develop materials. Based on the Intervention Log, equipment use was estimated. Costs for equipment were obtained from insurance inventory audit reports for each year. As required by Pennsylvania school accounting, equipment costs were based on a seven year useful life. The final cost was the product of the hourly cost for computers and the time used for intervention activities.

Utilities

Calculating costs for utilities was accomplished by reviewing yearly expenditures for heating and electricity. The gymnasium, fitness center, and weight room areas were on separate meters for natural gas and electric. Thus, only costs for the remaining portion of the building were used for calculations. Starting with the yearly cost, the first step was to deduct costs for June through August when school was not in sessions.

Since it was not possible to account for the fact that utility costs were not equally distributed across all spaces or throughout the day, it was necessary to estimate what portion of the overall utility costs should be attributed to classroom utilization. This process was facilitated by a computer monitored control system. Based on a review of consumption it was estimated that 58% of the overall costs could be attributed to the hours school was actually in session.

Applying this percentage to the overall cost, a yearly cost per square foot for gas and electric were calculated. From this result, a cost per square foot per hour was determined. As with facilities, the time estimates provided by faculty were used to determine utility costs.

Training Costs

Three approaches were used to provide training. First, substitutes were used to cover for faculty while they attended training. Second, training after school hours was conducted and paid through federal funds. Finally, study halls classes were covered by other faculty, to free English faculty for training during school hours. The cost for substitutes was calculated from payroll records. Federal funds records were examined to determine the cost for after school training. On the job training was calculated in the same manner as instructional costs and was based on each teacher's pro rated hourly salary and the time spent on training within the regular school day. These costs are embedded within personnel cost calculations.

Concentric Circle Model

Although the Concentric Circle Model (CCM) (Hartman, 1992) was originally conceptualized as a tool to assist school administrators in formulating budgets, here it is used to evaluate and characterize past budget decision-making. Several pieces of information were recorded. Each ingredient was first classified in one of the six CCM categories. In order to adapt the CCM to this specific study, it was necessary to categorize each ingredient listed in the budget worksheet. This was an easy task for most of the resources since they represented costs typically associated with a school budget. However, in the case of costs associated with teachers working at home, professional judgment was used to place it in a category. This resource was categorized as "teachers and students in the classroom" which falls within Circle 1 (See Figure 2 above). This classification makes sense considering that the activities performed at home, developing materials and scoring student papers, is merely an extension of work teachers would normally perform during school hours.

Once each ingredient was located within one of the CCM categories, it was also identified as "new" or "reallocated." If the resource was reallocated, the CCM category from which it was reallocated was indicated. The three year cost for each resource was calculated along with its percent of the total cost.

CHAPTER 4: RESULTS

Introduction

The results of the study are now presented using the questions posed in Chapter 1 to organize the presentation. Both group and individual data are presented for groups A, B, C and D as well as results for subgroups where data were available. Next, the results for calculations of each ingredient are presented. For those ingredients that were impacted by teacher time, specifically personnel costs, the high and low estimates are provided.

1. How were students identified for intervention strategies and how many were there in each subgroup?

Student Participants

Liberty Junior-Senior High School students were chosen for participation in this study based on their enrollment in the school's English curriculum and based on the availability of data from the Pennsylvania State System for Assessment. Since the PSSA was the tool used by Pennsylvania to measure a school's progress toward "Adequate Yearly Progress", it was the most appropriate instrument to measure success of the intervention strategies. However, since the PSSA was given only in grades 5, 6, 8, 9 and 11, some students could not be used to measure progress. To understand why recall that, during the initial year of the intervention, the Lead Teacher exposed only seventh grade students to the intervention strategies. Over the two subsequent years, all other students in grades 7-12 were exposed to these strategies. As a result, students who were sophomores, juniors, or seniors during the first year, were not exposed to intervention strategies before taking the PSSA test in eleventh grade. Thus, this made it impossible to collect PSSA results for these students after their exposure to intervention strategies. For this reason students who were in grades 6-9 during the initial year were selected to measure intervention effect. This selection provided comparison of pre-intervention PSSA reading scores in fifth grade to post intervention reading PSSA scores in eighth

grade. Comparisons were also possible for the writing PSSA given in sixth and ninth grade. (See Table 2 in Chapter 2)

Another group of students who could not be included in measuring the intervention effect was students with disabilities who were not mainstreamed for English. These students were not exposed to intervention activities because they received their English instruction in a special education resource room. The teacher for the junior high resource classroom was unable to participate in the training required for intervention activities due to a conflict with other required special education training.

By using this group of four classes who were in grades 6-9 during the initial year of the intervention, provided results from approximately 335 students to measure the impact of the interventions. As will be discussed next, although this group was predominantly white, it contained some subgroups as identified within the NCLB law.

Subgroups

For purposes of NCLB, PSSA data are disaggregated for poverty levels, race, gender, ethnicity, migrant status, disability, and limited English proficiency. NCLB specifies that all of these subgroups are to make Adequate Yearly Progress (AYP). However, thresholds have been established for subgroups to insure that schools with small populations of subgroups are not disadvantaged in attaining adequate yearly progress. Any subgroup containing less than forty (40) students is not disaggregated. Before 2001, scores were not reported for any subgroup containing less than ten students.

For Liberty Junior-Senior High School, the predominant class for race was "white." None of the other races represented contained sufficient numbers to surpass the state's threshold. The only other subgroup to meet the threshold was gender. Although small, since many estimates for the cost of moving students to high levels of achievement cite special needs students as most costly, where data were available, this subgroup was included in analyses of test scores. Thus, while it was not possible to parcel out costs

directed specifically toward this subgroup, their performance was analyzed. Table 6 summarizes the number of students within each subgroup, namely gender and disability.

Table 6

Intervention Subgroups				
Group	Total Students	Special Needs	Male	Female
Group A				
5th Grade Reading	64	0	28	36
8th Grade Reading	65	3	28	37
6th Grade Writing	68	3	30	38
9th Grade Writing	72	4	35	37
Group B				
5th Grade Reading	73	5	34	39
8th Grade Reading	69	5	31	38
6th Grade Writing	N/A ¹	N/A	N/A	N/A
9th Grade Writing	74	7	39	35
Group C				
5th Grade Reading	66	2	34	32
8th Grade Reading	69	5	31	38
6th Grade Writing	70	0	35	35
9th Grade Writing	79	4	40	39
Group D				
5th Grade Reading	85	16	47	38
8th Grade Reading	69	9	37	32
6th Grade Writing	65	8	33	32
9th Grade Writing	N/A	N/A	N/A	N/A

1- N/A indicates Writing PSSA not administered to this group.

2. What intervention strategies were used to prepare students to take the eighth grade Reading and ninth grade Writing PSSA?

Improving reading and writing performance are high priorities goals for any school. The interventions used in this study were aimed at improving these core skills with performance on Pennsylvania's statewide testing (PSSA) as the gauge for success. Thus, separating out the intervention activities whose primary objective was to improve test scores from those activities which had as their primary objective to enhance students reading and writing was critical. The intervention began with the hiring of a veteran

teacher who came to be referred to as the Lead Teacher. This teacher possessed extensive knowledge of Pennsylvania reading and writing standards and knowledge of the Pennsylvania State System for Assessment. No other candidates were considered for this Lead Teacher position. The Lead Teacher was placed at seventh grade so that intervention activities could be piloted. Thus, Group D, the graduating class of 2007, was the first to be exposed to instruction and assessment specifically aimed at improving reading and writing achievement as reflected in PSSA test scores.

The primary strategy for improving student performance on the PSSA was to implement quarterly local assessments in reading and writing which utilized the same scoring rubric used by the state for the PSSA reading and writing tests. Further, English teachers were required to incorporate at least one multi-draft writing assignment during each quarter. Since these requirements were labor intensive, another intervention strategy employed was to reduce class sizes. This was accomplished through hiring of one additional faculty member in the English department. This was necessary to permit faculty to provide more opportunity for students to write while still making it feasible to provide thorough written feedback on each student's paper.

In addition, the Lead Teacher performed a number of tasks to help teachers improve student reading and writing and thus improve PSSA tests scores. For example, the Lead Teacher deconstructed PSSA test items to determine their skill requirements. Further, the Lead Teacher analyzed question stems on the multiple choice portion of the PSSA reading exam. These stems were provided to faculty so that they could be incorporated into local assessments. Analyses were also conducted on the sample papers provided by the state. Here the Lead Teacher noted commonalities of sample papers which had been given a proficient or advanced score. The results of her analyses were shared with English faculty. As an example, when analyzing written responses which are included as a component of the PSSA reading test, it was noted that a top score of four required the student to provide three examples from the highest category in Bloom's taxonomy. Thus, this knowledge was passed on to all English faculty who in turn used it to coach students to improve their response on the written portion of the reading PSSA.

3. **What were the results of this intervention in terms of the number of students attaining proficiency? How did the results compare to student scores before the intervention? What was the performance of each subgroup?**

Reading Performance: Group and Individual Results

Table 7 below summarizes the overall performance on the PSSA reading exam for the four groups studied. This table shows the results of all students and represents group

Table 7

Reading PSSA Results Groups A, B, C, and D				
	Group A	Group B	Group C	Group D
Grade 5				
Number of Students	64	73	66	85
% Proficient	26.6%	32.9%	31.8%	43.5%
% Advanced	37.5%	20.5%	31.8%	17.6%
Total Combined % Prof./Adv.	64.1%	53.4%	63.6%	61.1%
Grade 8				
Number of Students	65	69	69	69
% Proficient	56.9%	10.1%	30.4%	37.1%
% Advanced	13.8%	33.3%	46.4%	44.8%
Total Combined % Prof./Adv.	70.7%	43.4%	76.8%	81.9%
Change Between 5th and 8th Grade				
Change in % Proficient	30.3%	-22.8%	-1.4%	-6.4%
Change in % Advanced	-23.7%	12.8%	14.6%	27.2%
Total % Change Prof./Adv. Combined	6.6%	-10.0%	13.2%	20.8%

data. Groups C and D showed the most overall improvement with increases 13.2 % and 20.8 % respectively in the number of students passing the exam at either the proficient or advanced performance level. Group A also showed slight improvement from 64.1 % combined proficient and advanced to 70.7 % combined proficient and advanced. Most of this Group A improvement was accounted for by an increase in students performing at the proficient level, an increase of 30.3 %, while the number of students performing at the advanced level decreased from 37.5 % in fifth grade to 13.8% in eighth grade.

Group B, which did participate in some intervention activities before testing, showed a decrease in the number of students scoring proficient or above in reading, moving from 53.4% combined proficient and advanced in fifth grade to 43.4% combined proficient and advanced in eighth grade. This drop reflected a decrease in the number of students scoring proficient of 32.9% in fifth grade to 10.1% in eighth grade. There was an increase of 12.8% in students scoring at the advanced level, with 20.5% scoring advanced in fifth grade and 33.3% in eighth grade.

Since individual scores were reported for Groups C and D, the graduating classes of 2007 and 2008 respectively, a more in-depth analysis of scores was possible. Tables 8 and 9 show their respective performances on the reading PSSA in fifth grade and eighth grade. These tables represent students who were enrolled continuously between fifth grade and eighth grade. For Group C, twenty (20) students maintained their performance, five (5) decreased their performance, and thirty four (34) improved their performance. Of those students improving their performance, the largest change was the movement of sixteen (16) students from proficient performance in fifth grade to advanced performance in eighth grade. Twelve (12) students improved from basic to proficient. Of the remaining six students showing improvement, two (2) improved from below basic to basic, two (2) moved from below basic to proficient, and two (2) improved from basic to advanced. Of those students showing no change, nine (9) were already at the advanced level, four (4) were proficient and seven (7) were below basic or basic.

Group D performance was similar to Group C. This information is presented in Table 9 below. Nineteen (19) students maintained their performance while four (4) decreased. Of those maintaining their performance, as in Group C, a majority of eight (8) were at the advanced level while five (5) were proficient. Six (6) students maintained a nonproficient performance. Overall thirty-two (32) students improved their performance with nineteen (19) moving from proficient to advanced and eleven (11) improving from either below basic or basic to proficient or advanced. One (1) student improved from below basic to basic.

Table 8

Tracking Individual Score Changes Between Grades 5 and 8 Group C Individual Reading	
Below Basic to Basic	2
Below Basic to Proficient	2
Below Basic to Advanced	0
Basic to Proficient	12
Basic to Advanced	2
Proficient to Advanced	16
Students with no change in performance	20
Advanced to Proficient	1
Advanced to Basic	0
Advanced to Below Basic	0
Proficient to Basic	4
Proficient to Below Basic	0
Basic to Below Basic	0
Total Students Tested	59

Summary of Results for Group D-Reading	Number	%
Total Students Improving Performance	34	57.6%
Total Students Decreasing Performance	5	8.5%
Total Student With No Change	20	33.9%

Students With No Change-Breakdown		
Total Student With No Change	Below Basic	2
Total Student With No Change	Basic	5
Total Student With No Change	Proficient	4
Total Student With No Change	Advanced	9

Table 9

Tracking Individual Score Changes Between Grades 5 and 8 Group D Individual Reading	
Below Basic to Basic	1
Below Basic to Proficient	1
Below Basic to Advanced	0
Basic to Proficient	9
Basic to Advanced	2
Proficient to Advanced	19
Students with no change in performance	19
Advanced to Proficient	2
Advanced to Basic	0
Advanced to Below Basic	0
Proficient to Basic	1
Proficient to Below Basic	0
Basic to Below Basic	1
Total Students Tested	55

Summary of Results for Group D-Reading	Number	%
Total Students Improving Performance	32	58.2%
Total Students Decreasing Performance	4	7.3%
Total Student With No Change	19	34.5%

Students With No Change-Breakdown		
Total Student With No Change	Below Basic	3
Total Student With No Change	Basic	3
Total Student With No Change	Proficient	5
Total Student With No Change	Advanced	8

Writing Performance

Analyzing the results of the writing PSSA was hampered by changes in this exam both prior to and during the study. In 1999 the date for administering the writing PSSA was changed from October to March. Thus, Group B was not assessed for writing in sixth grade. In 2005 the writing PSSA was again moved, this time from ninth grade to eighth grade. In this case, Group D was not tested in ninth grade. Table 10 summarizes the available data for all Group data. Here, Group A, which received no intervention, declined of 7% in the number of students scoring proficient or advanced. Group C, which received full intervention, experienced a 25.4 % increase in the number of students scoring proficient or advanced. Although no data were available for Group B in sixth

grade, their performance for ninth grade in writing, with 77% scoring proficient or above, was better than that of Group A, which showed 72% scoring proficient or above.

Individual PSSA writing scores were reported for Group C and this information is displayed in Tables 11. As with reading scores, the most dramatic improvement in student performance seems to be in the large increase of students performing at the advanced level. Overall, thirty-one (31) students maintained their performance while eight (8) decreased. Of those maintaining their performance, fourteen (14) maintained a proficient performance while the same amount maintained an advanced performance. Combined, these two groups account for over 90% of those students whose performance did not change. Twenty (20) students did show an increase. Of these, thirteen (13) were students who moved to advanced levels of performance

Table 10

Writing PSSA Results Groups A, B, C, and D				
	Group A	Group B	Group C	Group D
Grade 6				
Number of Students	68	N/A ¹	70	65
% Proficient	79.0%	N/A	13.0%	60.8%
% Advanced	0.0%	N/A	50.2%	5.0%
Total Combined % Prof./Adv.	79.0%	N/A	63.2%	65.8%
Grade 9				
Number of Students	72	74	79	N/A
% Proficient	66.5%	8.1%	48.1%	N/A
% Advanced	5.0%	68.9%	40.5%	N/A
Total Combined % Prof./Adv.	72.0%	77.0%	88.6%	N/A
Change Between 6th and 9th Grade				
Change in % Proficient	-12.5%	N/A	35.1%	N/A
Change in % Advanced	5.0%	N/A	-9.7%	N/A
Total % Change Prof./Adv. Combined	-7.0%	N/A	25.4%	N/A

1- N/A indicates Writing PSSA not administered to this group.

Table 11

Tracking Individual Score Changes Between Grades 5 and 8 Group C Individual Writing	
Below Basic to Basic	1
Below Basic to Proficient	0
Below Basic to Advanced	0
Basic to Proficient	6
Basic to Advanced	2
Proficient to Advanced	11
Students with no change in performance	31
Advanced to Proficient	7
Advanced to Basic	0
Advanced to Below Basic	0
Proficient to Basic	1
Proficient to Below Basic	0
Basic to Below Basic	0
Total Students Tested	59

Summary of Results for Group D-Reading	Number	%
Total Students Improving Performance	20	33.9%
Total Students Decreasing Performance	8	13.6%
Total Student With No Change	31	52.5%

Students With No Change-Breakdown		
Total Student With No Change	Below Basic	2
Total Student With No Change	Basic	1
Total Student With No Change	Proficient	14
Total Student With No Change	Advanced	14

Performance of Students With Disability

Table 12 summarizes the performance of students with disabilities on the Reading PSSA. Individual scores for students with disabilities were not available before 2001. It can be seen that, while three out of five Group B students with disabilities scored proficient for Reading in eighth grade, students with disabilities in Groups C and D did not perform as well. For Group C only one of five students scored proficient in eighth grade. Of the sixteen students with disabilities in Group D during fifth grade, ten scored below basic and only four scored above proficient. This performance improved slightly in eighth grade for Group D where, out of nine students with disabilities, four scored above proficient. However, it is important to keep in mind that the results in Table 12 represent students who were not necessarily present continuously between fifth and eighth grade. This population of students changed significantly over time. For example, for Group D, where individual students could be tracked, sixteen special needs students took the reading PSSA in 5th grade. By 8th grade, although nine (9) special needs students took the exam, records show that only seven (7) had maintained continuous enrollment since 5th grade. Of the seven students with continuous enrollment, one had performed proficient in 5th grade and again in 8th grade. The remaining six students performed at the Basic or Below Basic level in 5th grade and remained there in 8th grade. Students with disabilities accounted for ten of the thirteen students reported as nonproficient in 8th grade reading for Group C and five of nine for Group D.

Results for the Writing PSSA for student with disabilities, presented in Table 13 below, were difficult to analyze since Group B did not take the Writing PSSA in sixth grade and Group D did not take this exam in ninth grade. Further, scores for students with disabilities were not available prior to 2001. Indeed, Group C was the only group for which data were available for sixth and ninth grade. Unfortunately, there were no students with disabilities from Group C in sixth grade. For Group C students with disabilities in ninth grade, only one of four scored proficient or above.

Table 12

Reading PSSA Results Groups A, B, C, and D Students With Disabilities				
Group	A	B	C	D
Grade 5				
Number of Students	0	5	2	16
Number Below Basic	NR	NR ¹	1	10
Number Basic	NR	NR	1	2
Number Proficient	NR	NR	0	2
Number Advanced	NR	NR	0	2
Total Prof./Adv.	NR	NR	0	4
Grade 8				
Number of Students	3	5	5	9
Number Below Basic	NR	1	2	2
Number Basic	NR	1	2	3
Number Proficient	NR	3	1	3
Number Advanced	NR	0	0	1
Total Prof./Adv.	NR	3	1	4
Change 5th to 8th grade				
Proficient	NR	NR	1	1
Advanced	NR	NR	0	-1
Total Prof./Adv.	NR	NR	1	0

1- NR indicates scores not reported for students with disabilities.

Table 13

Writing PSSA Results Groups A, B, C, and D Students With Disabilities				
Group	A	B	C	D
Grade 6				
Number of Students	3	NA ²	0	8
Number Below Basic	NR ¹	NR	0	4
Number Basic	NR	NR	0	2
Number Proficient	NR	NR	0	2
Number Advanced	NR	NR	0	0
Total Prof./Adv.	NR	NR	0	2
Grade 9				
Number of Students	4	7	4	NA
Number Below Basic	NR	2	1	NR
Number Basic	NR	2	2	NR
Number Proficient	NR	3	1	NR
Number Advanced	NR	0	0	NR
Total Prof./Adv.	NR	3	1	NR
Change 6th to 9th grade				
Proficient	NR	NR	1	NR
Advanced	NR	NR	0	NR
Total Prof./Adv.	NR	NR	1	NR

1- NR indicates scores not reported for students with disabilities.

2- N/A indicates Writing PSSA not administered to this group.

Gender Performance

Tables 14 and 15 below show the Group reading and writing results respectively. As can be seen, the results for male and female are similar. Since individual results were reported for Groups C and D for the Reading PSSA, it was possible to exam individual students and thus to track the change in performance of each male and female student. This information is reported in Tables 16 and 17 for reading. Group D did not take the writing PSSA in ninth grade as explained above. However, Table 18 does report the change in writing performance for Group D Individual students by gender. All of these tables reveal similar improvements in performance based on gender.

Table 14

Reading PSSA Results Groups A, B, C, and D Gender								
	Group A		Group B		Group C		Group D	
Grade 5	Male	Female	Male	Female	Male	Female	Male	Female
Number of Students	NR ¹	NR	NR	NR	34	32	47	38
Number Below Basic	NR	NR	NR	NR	4	2	5	2
Number Basic	NR	NR	NR	NR	9	10	12	8
Number Proficient	NR	NR	NR	NR	15	13	20	18
Number Advanced	NR	NR	NR	NR	6	7	10	10
Total Prof./Adv.	NR	NR	NR	NR	21	20	30	28
Grade 8								
Number of Students	28	37	31	38	31	38	37	32
Number Below Basic	4	4	10	7	1	1	2	1
Number Basic	3	8	10	11	5	3	2	2
Number Proficient	13	24	8	16	10	14	17	11
Number Advanced	8	1	3	4	15	17	16	18
Total Prof./Adv.	21	25	11	20	25	31	33	29
Change (8th-5th Grade)								
Proficient	NR	NR	NR	NR	-5	1	-3	-7
Advanced	NR	NR	NR	NR	9	10	6	8
Total Prof./Adv.	NR	NR	NR	NR	4	11	3	1

1- NR indicates scores not reported by gender.

Table 15

Writing PSSA Results Groups A, B, C, and D Gender								
	Group A		Group B		Group C		Group D	
Grade 6	Male	Female	Male	Female	Male	Female	Male	Female
Number of Students	30	38	N/A ²	N/A	35	35	33	32
Number Below Basic	NR ¹	NR	N/A	N/A	2	0	1	0
Number Basic	NR	NR	N/A	N/A	4	3	5	2
Number Proficient	NR	NR	N/A	N/A	17	15	25	25
Number Advanced	NR	NR	N/A	N/A	12	17	2	5
Total Prof./Adv.	NR	NR	N/A	N/A	29	32	27	30
Grade 9								
Number of Students	35	37	39	35	40	39	N/A	N/A
Number Below Basic	0	2	4	3	2	1	N/A	N/A
Number Basic	2	1	5	5	3	3	N/A	N/A
Number Proficient	28	32	26	25	22	16	N/A	N/A
Number Advanced	5	2	4	2	13	19	N/A	N/A
Total Prof./Adv.	33	34	30	27	35	35	N/A	N/A
Change (9th-6th Grade)								
Proficient	NR	NR	NR	NR	5	1	NR	NR
Advanced	NR	NR	NR	NR	1	2	NR	NR
Total Prof./Adv.	NR	NR	NR	NR	6	3	NR	NR

1- NR indicates scores not reported by gender.

2- N/A indicates Writing PSSA not administered to this group.

Table 16

Tracking Individual Score Changes Between Grade 5 and 8 Group C Individual Reading Gender		
	Male	Female
Below Basic to Basic	2	0
Below Basic to Proficient	1	1
Below Basic to Advanced	0	0
Basic to Proficient	5	7
Basic to Advanced	1	1
Proficient to Advanced	8	8
Students with no change in performance	10	10
Advanced to Proficient	0	1
Advanced to Basic	0	0
Advanced to Below Basic	0	0
Proficient to Basic	3	1
Proficient to Below Basic	0	0
Basic to Below Basic	0	0
Total Students Tested	30	29

Summary of Results for Group C-Reading	Male	Female
Total Students Improving Performance	17	17
Total Students Decreasing Performance	3	2
Total Student With No Change-Overall	10	10

Students With No Change-Breakdown		Male	Female
Total Student With No Change	Below Basic	1	0
Total Student With No Change	Basic	1	1
Total Student With No Change	Proficient	3	3
Total Student With No Change	Advanced	5	6

Table 17

Tracking Individual Score Changes Between Grade 5 and 8 Group D Individual Reading Gender		
	Male	Female
Below Basic to Basic	1	0
Below Basic to Proficient	0	1
Below Basic to Advanced	0	0
Basic to Proficient	6	3
Basic to Advanced	1	1
Proficient to Advanced	9	10
Students with no change in performance	10	9
Advanced to Proficient	1	1
Advanced to Basic	0	0
Advanced to Below Basic	0	0
Proficient to Basic	1	0
Proficient to Below Basic	0	0
Basic to Below Basic	1	0
Total Students Tested	30	25

Summary of Results for Group D-Reading	Male	Female
Total Students Improving Performance	17	15
Total Students Decreasing Performance	3	1
Total Student With No Change-Overall	10	9

Students With No Change-Breakdown		Male	Female
Total Student With No Change	Below Basic	1	0
Total Student With No Change	Basic	0	1
Total Student With No Change	Proficient	4	3
Total Student With No Change	Advanced	5	5

Table 18

Tracking Individual Score Changes Between Grades 6 and 9 Group C Individual Writing Gender		
	Male	Female
Below Basic to Basic	1	0
Below Basic to Proficient	0	0
Below Basic to Advanced	0	0
Basic to Proficient	5	1
Basic to Advanced	0	2
Proficient to Advanced	6	5
Students with no change in performance	14	17
Advanced to Proficient	4	3
Advanced to Basic	0	0
Advanced to Below Basic	0	0
Proficient to Basic	0	1
Proficient to Below Basic	0	0
Basic to Below Basic	0	0
Total Students Tested	30	29

Summary of Results for Group C-Writing	Male	Female
Total Students Improving Performance	12	8
Total Students Decreasing Performance	4	4
Total Student With No Change	14	17

Students With No Change-Breakdown	Male	Female
Total Student With No Change Below Basic	1	1
Total Student With No Change Basic	1	0
Total Student With No Change Proficient	4	10
Total Student With No Change Advanced	8	6

4. **What resources were used with the intervention strategies? Were the resources that were utilized new or additional to the existing program or were they reallocated from existing high school or district resources? Who are the constituents sharing costs and what is the contribution of each?**

The primary resource used during the intervention was personnel. Table 19 below identifies the three constituents who provided resources for the intervention, namely, the District, the Federal Government, and Teachers and Administrators. At 54.6 %, the District accounted for the largest share of intervention costs. Teachers and administrators, however, shouldered 44.4 % of the cost. The federal government, at 1.1%, funded the smallest share.

Table 19

Final Intervention Cost Worksheet Constituent Shares				
Intervention Categories	Cost to State & District	Cost to Federal Govt.	Cost to Admin. & Teachers	Row Totals
Personnel	\$188,174	\$875	\$156,302	\$345,351
Facilities	\$2,028	\$541		\$2,569
Materials & Equipment	\$1,368	\$2,358		\$3,726
Other Inputs	\$618			\$618
Totals	\$192,188	\$3,774	\$156,302	\$352,264
Constituent Percentages	54.6%	1.1%	44.4%	100%

The Concentric Circle Model (CCM), presented in Table 20 below, provided another tool for examining intervention costs. This table uses the "best estimate" costs, as these preserve the relative impact of each intervention cost. Costs within Circle 1 of the CCM represent those closest to the classroom and accounted for nearly 97% of all resources. Categories in Circle 4 and Circle 6 are not represented as none of the resources fell within these two circles. The CCM also indicates whether each resource was new or reallocated. The cost associated with teachers working after school was the most costly

new resource accounting for 44.4% of the total three year intervention cost. The addition of an English teacher was the second most costly new resource accounting for 38.7% of

Table 20

Concentric Circle Model Resource Allocation			
CCM Category	Resource ¹	3 Yr. Cost	% of Total Resources
Circle 1 -Teacher and Students in Classroom			
Substitute Teachers	R	\$680	0.2%
Additional Teacher	N	\$136,170	38.7%
Lead Teacher	R	\$15,142	4.3%
Other Classroom Teachers	R	\$33,038	9.4%
Teacher Work At Home	N	\$156,302	44.4%
SubTotal: Circle 1		\$341,332	96.9%
Circle 2 School-Based Instructional Support			
Workbooks	N	\$2,358	0.7%
Computer Technology	R	\$807	0.2%
Ink Cartridges	R	\$366	0.1%
Paper	R	\$195	0.1%
After School Training	N	\$875	0.2%
SubTotal: Circle 2		\$4,601	1.3%
Circle 3 School-Based Operations Support			
Administrative Personnel	R	\$3,144	0.9%
Office Space	R	\$203	0.1%
SubTotal: Circle 3		\$3,347	1.0%
Circle 5 District-Level Operations Support			
Classrooms	R	\$1,384	0.4%
Library	R	\$608	0.2%
Writing Lab	R	\$374	0.1%
Utilities	R	\$618	0.2%
SubTotal: Circle 5		\$2,984	0.8%
Total 3 Yr. Cost		\$352,264	100.0%

¹**Resource Type Key**

N=New Resource

R=Reallocated

the total cost. The cost for existing classroom teachers, including the Lead teacher, accounted for 13.7% of the total cost.

5. What were the costs of resources used for intervention strategies?

Final Three Year Intervention Costs

Based on Levin's "ingredients" approach, costs for this intervention were estimated for four categories of ingredients including personnel, facilities, equipment and supplies, and other inputs. Tables displaying supporting calculations used to estimate costs for facilities, utilities, and supplies and equipment, are found in Appendix A through Appendix H . The final cost data are presented here.

Table 21 below shows the total three year costs for all intervention strategies. The total three year cost for the intervention of \$ 352,264 represents a per student cost of \$809 per student. Table 22 summarizes the costs by category. As can be seen, personnel costs accounted for more than 98% of the total cost. Hiring of an additional English teacher was the single most costly personnel resource. The Lead Teacher was the next most costly resource.

In-School and After-School Personnel Costs

Since personnel costs accounted for 98% of all costs, these costs are presented in greater detail in Table 23 for each year of the intervention. In-school activities that resulted in intervention costs included training, preparing and administering assessments, classroom instruction, and team meetings. Most of the after-school time was devoted to scoring and recording writing and reading assessments. As explained earlier, Teacher # 4, the Lead Teacher, performed other duties which required additional time. This additional time is reflected in her costs.

Due to health issues, Teacher #2 scored some student papers for Teacher #1. This fact accounts for the decrease in cost for Teacher # 1 from year two to year three and the increase in costs for in-school work for Teacher # 2 from year two to year three. Since Teacher #6 represents an addition to the staff, her cost included her total salary and benefits. However, her after-school costs were calculated the same as all other teachers. All of the in-school activities are described in the Teacher Log in Appendix A.

Table 21

Final Intervention Cost Worksheet Best Estimate				
Intervention Categories	Cost to State & District	Cost to Federal Govt.	Cost to Teachers & Admin.	Row Totals
Personnel				
Teacher #1-In-School	\$9,247			\$9,247
Teacher #2-In School	\$8,548			\$8,548
Teacher #3-InSchool	\$6,306			\$6,306
(Lead) Teacher #4-In-School	\$15,142			\$15,142
Teacher #5-In-School	\$8,937			\$8,937
Add'l English Teacher #6-In-School	\$136,170			\$136,170
Administration-In-School	\$3,144			\$3,144
Teacher #1-After School			\$11,980	\$11,980
Teacher #2-After School			\$31,921	\$31,921
Teacher #3-After School			\$21,160	\$21,160
Teacher #4- After School			\$45,571	\$45,571
Teacher #5- After School			\$25,454	\$25,454
Teacher #6- After School			\$18,987	\$18,987
Administration- After School			\$1,229	\$1,229
Substitutes	\$680			\$680
After School Training		\$875		\$875
Personnel Subtotals	\$188,174	\$875	\$156,302	\$345,351
Facilities				
Classrooms	\$1,093	\$291		\$1,384
Writing Lab	\$295	\$79		\$374
Library	\$479	\$129		\$608
Office	\$161	\$42		\$203
Facilities Subtotals	\$2,028	\$541		\$2,569
Materials & Equipment				
Computer Equipment	\$807			\$807
Printer Cartridges	\$366			\$366
Paper	\$195			\$195
Workbooks		\$2,358		\$2,358
Materials & Equipment Subtotals	\$1,368	\$2,358	\$0	\$3,726
Other Inputs				
Utilities	\$618			\$618
Other Inputs Subtotals	\$618			\$618
Constituent Totals	\$192,188	\$3,774	\$156,302	\$352,264
Constituent Shares	54.6%	1.1%	44.4%	100%

Table 22

Intervention Costs by Category Best Estimate		
Category	Cost	%
Personnel	\$345,351	98.0%
Facilities	\$2,569	0.7%
Materials and Equipment	\$3,726	1.1%
Other Inputs(Utilities)	\$618	0.2%
Total	\$352,264	100%

Table 23

Three Year Costs Best Estimate Personnel Costs In-School and After-School				
Ingredient	Yr. 1	Yr. 2	Yr. 3	Totals
Teacher #1 Costs				\$21,227
In-School	\$0	\$4,957	\$4,290	\$9,247
After-School	\$0	\$5,640	\$6,340	\$11,980
Teacher #2 Cost				\$40,469
In-School	\$0	\$4,100	\$4,448	\$8,548
After-School	\$0	\$16,353	\$15,568	\$31,921
Teacher #3 Costs				\$27,466
In-School	\$0	\$3,118	\$3,188	\$6,306
After-School	\$0	\$10,667	\$10,493	\$21,160
Teacher #4 (Lead Teacher) Costs				\$60,713
In-School	\$2,876	\$6,045	\$6,221	\$15,142
After-School	\$12,420	\$16,422	\$16,729	\$45,571
Teacher #5 Costs				\$34,391
In-School	\$0	\$4,397	\$4,540	\$8,937
After-School	\$0	\$12,408	\$13,046	\$25,454
Teacher # 6 (Additional Teacher) Costs				\$155,157
In-School	\$0	\$64,562	\$71,608	\$136,170
After-School	\$0	\$8,423	\$10,564	\$18,987
Administration Cost				\$4,373
Administration-In-School	\$867	\$1,340	\$937	\$3,144
Administration- After School	\$295	\$375	\$559	\$1,229
Other Personnel Costs				
Substitutes		\$680		\$680
After School Training (Federally Funded)		\$875		\$875
Column Totals	\$16,458	\$160,362	\$168,531	\$345,351

Bracketed Costs

As discussed above, personnel costs were bracketed to insure that the true cost for the interventions was captured. Table 24 below shows the high and low cost estimates for in-school personnel costs with the "best estimate" cost for comparison. Also shown is the

percent over or below the "best estimate" cost. Table 25 shows the same information for after-school personnel costs. Tables 24 and 25 look only at those costs estimates that were bracketed and thus the percentage changes indicated are based only on costs for In-School Faculty and After-School Faculty.

Table 24

Bracketed Costs ¹			
In-School Faculty			
August 2001 to July 2004			
	Low Estimate	Best Estimate	High Estimate
Teacher #1	\$7,791	\$9,247	\$10,684
Teacher #2	\$8,335	\$8,548	\$9,727
Teacher #3	\$6,182	\$6,306	\$7,215
Teacher #5	\$6,669	\$8,937	\$9,146
Totals	\$28,977	\$33,038	\$36,772
% Difference	-12.29%		11.30%

1-Costs for teacher #6 (\$ 136,160) were not estimated since all of her salary and benefits were treated as additional resources.
Also, Teacher # 4 (Lead Teacher) costs were not bracketed as explained in Chapter 3, pg. 38.

Table 25

Bracketed Costs ¹			
After-School Faculty			
August 2001 to July 2004			
	Low Estimate	Best Estimate	High Estimate
Teacher #1	\$11,980	\$11,980	\$30,078
Teacher #2	\$12,706	\$31,921	\$31,921
Teacher #3	\$9,722	\$21,160	\$24,372
Teacher #5	\$10,521	\$25,454	\$26,368
Teacher #6	\$11,822	\$18,987	\$29,525
Totals	\$56,751	\$109,502	\$142,264
% Difference	-48.17%		29.92%

1-Teacher # 4 (Lead Teacher) is not included as explained in Chapter 3, pg. 38.

The cost for the Lead Teacher are not included since her costs were not bracketed as explained in Chapter 3 (See page 38). Also, since the costs for administration were not significant, these costs were also not bracketed. As can be seen, the range of costs for after-school is much wider than for in-school work. This is largely because these times were more difficult to triangulate through other documents such as logs, lesson plans, or meeting minutes. Also, it reflects different work styles among faculty.

Table 26 below compares the three cost estimates. Here, the low and high personnel costs have been factored into the "best estimate" cost worksheet. The final column shows the range above and below the "best estimate." The overall range between \$291, 94 and \$384,902 represents a range of \$93,308 which is 26.4% of the "best estimate" cost.

Table 26

Bracket Costs Three Year Cost Comparison		
Estimate	3 Yr. Cost	Range
Low Estimate	\$291,594	-17.22%
Best Estimate	\$352,264	0.00%
High Estimate	\$384,902	9.27%

CHAPTER 5: CONCLUSIONS

Introduction

Before presenting conclusions relating to intervention effect, intervention costs, and resource allocation, it is instructive to review two key aspects of this study which will help to frame these conclusions. After presenting these conclusions, limitations for this study will be presented.

First, in contrast to other recent studies attempting to determine NCLB cost, this study focused solely on the cost of activities directly related to raising student achievement in reading and writing as measured by Pennsylvania's statewide test. Other NCLB cost studies have attempted to identify costs for all activities required of schools as they attempt to meet all NCLB requirements. For example, a study in Virginia (Augenblick et al, 2005) which estimated the cost at the local school level for NCLB compliance, identified eight specific "components" which were examined. These components included such activities as communicating with parents, hiring highly qualified teachers, and remediation activities. None of the eight components specifically mentioned raising achievement of all students. The same is true of similar studies in New Mexico (Palaich et al, 2005) and Connecticut (Sternberg, 2005) which also estimated school level costs.

In limiting its focus, this study attempted to provide more accurate cost data for one core requirement of NCLB compliance. This narrowing of focus also addressed one of the problems inherent in all research aimed at determining the cost of NCLB compliance, namely, separation of those costs which are directly related to NCLB compliance from those that would have been born even without enactment of this law. As Hanushek (2004) stated this problem, "The question is: How do you separate out the added cost of No Child Left Behind from what [schools] would be doing anyway?" By focusing on a few intervention strategies aimed at what is arguably the primary NCLB goal, improving student achievement, this study was better able to identify those resources which were specifically NCLB dependent.

A second important aspect of this study relates to its target audience. Resources in this study were used to improve the performance of all students. This concern for raising the achievement of all students at LJSH began before passage of NCLB. The original interest in writing instruction was not driven by low test scores but rather by research

linking writing to increased achievement across all subject areas. The impact of NCLB, with its accompanying accountability measures, was twofold. First, it created a greater sense of urgency for improving writing skills. Second, it redirected the school's original plan to introduce writing across the curriculum to that of concentrating this writing instruction within Language Arts. In addition, a local assessment system was implemented which paralleled Pennsylvania's statewide system.

In directing resources at all students, the LJSHS response to NCLB stands in direct contrast to the approach assumed by most researchers who conducted early cost estimates preceding implementation of NCLB. These studies projected large costs for remediation (Hanushek, 2004). This focus on remediation meant that these NCLB cost estimates looked at resources directed at the smaller percentage of "at-risk" students who have been unable to pass over the NCLB proficiency bar, while the LJSHS cost estimates include resources directed at all students. Costs estimates for NCLB which have been published since its implementation, such as those cited in New Mexico, Virginia, and Connecticut, while broadening their cost estimates to look at all NCLB requirements, have continued to focus on assessing the cost for resources directed at helping nonproficient students rather than raising the achievement of all students. Before examining what impact this difference in approach has had on costs, the success of the LJSHS approach in raising student achievement will be reviewed.

Intervention Effect

The strategies used during this study were successful in improving the performance of student. In Groups C and D, where it was possible to track individual students, the percentages of students improving their performance in Reading were 57.6% and 58.2% respectively. In Writing, 33.9% of the students improved their performance for Group C. (Note: Group D did not take the writing exam in ninth grade due to changes in Pennsylvania's PSSA testing schedule.)

The interventions were especially successful in moving students to the advanced level of performance. For Groups C individual student results, out of a possible fifty-nine (59) students, a total of eighteen (18) or 35% improved to advanced performance in

Reading. For Group D individual student results, which contained fifty-five (55) students, twenty-one (21) students moved to advanced performance in Reading for a 38% net increase between fifth grade and eighth grade. In Writing the net increase of students moving to advanced performance was thirteen (13) or 22% for Group C between sixth grade and ninth grade.

Achievement results do not appear to be related to gender. For all groups, performance was similar for males and females. For example, for the Group C individual results, where thirty four (34) students improved their Reading score from fifth to eighth grade, males and females each accounted for seventeen (17) of these students. Likewise, for Group D individual student results in Reading, out of thirty-two students showing improvement between fifth and eighth grade, seventeen (17) were males and fifteen (15) were females. There was a small difference in gender performance in Writing in the Group C individual results. Here, out of twenty student improving their performance between sixth and ninth grade, twelve (12) were male and eight (8) were females. As reflected in Table 13, half of this difference is due to a large number of males moving from basic to proficient performance. There were four (4) males improving from basic to proficient compared to one (1) female.

In reviewing the results of students with disabilities it must be remembered that some of these students who received their English and Reading instruction in a special education resource room and were not exposed to interventions used during the study. Thus, the results of students with disabilities in Groups A and B, where only group data were available, do not provide a useful comparison since it is impossible to know which of these students were exposed to intervention strategies. Individual student scores were available for Reading for Groups C and D and for Writing for Group C. The Group C individual results for Reading contained seven (7) students with disabilities of which five (5) were Basic or Below Basic in fifth grade. By eighth grade this result had not changed- however, one student had improved from Proficient to Advanced. For Group D individual results for Reading, of sixteen (16) students with disabilities, ten (10) performed Below Basic and two (2) performed Basic in fifth grade for a total of twelve (12) students nonproficient. By eighth grade, the total nonproficient decreased to ten (10) with two additional students performing proficient. In Writing, Group C individual

results students showed no change between sixth and ninth grade. Although these results report small groups of students, they suggest that the intervention strategies were not as successful in improving the performance of students with disabilities as compared to other subgroups.

These results seem to suggest that strategies aimed at increasing the achievement of all students will not be successful with the lowest performing students. As many researchers have stated, (See Natriello, 1998 and Odden and Archibald, 2001) moving the weakest students to proficiency will require additional resources. The question for schools is whether to add new resources or to shift resources away from students who are already achieving at proficient levels. As will be discussed further, LJSHS chose the latter approach.

Intervention Costs: District

The three year best estimate cost of the study was \$352,264. This represents a cost of \$809 per student based on an average daily enrollment of 435 students over the three year study with nonparticipating students excluded. Of this per student cost the district supplied \$442, teachers and administrators accounted for \$358, and the remaining \$9 was provided by the federal government. All of the cost born by teachers and administrators was for after-school work. In-school work for teachers and administrators, a cost which was born by the district, accounted for \$431 per student over the three years of the intervention. However, this cost includes all of the salary and benefits for the additional teacher. When this cost is removed, the per student cost decreases to \$118 for the district.

Since personnel costs accounted for 98% of the total estimated cost, a sensitivity analysis was employed to provide a range of possible outcomes utilizing low and high estimates of teacher time. The comparison results for this calculation are shown in Table 27. When the low cost estimates for teacher in-school and after-school are substituted for the best estimate, the new three year cost becomes \$291,594. When the high estimate for teacher in-school and after-school time are used, the three year total increases to \$384,902. This places the per student cost between a low of \$670 to a high of \$885 for

the three years of intervention. The per student cost attributed to the District falls between a low of \$366 to a high estimate of \$484.

Table 27

Three Year Per student Cost Estimates			
	Low Estimate	Best Estimate	High Estimate
Total Three Year Cost	\$291,594	\$352,264	\$384,902
Cost Per Student	\$670	\$809	\$885
Percent Difference	-20.8%		9.3%

The per student costs revealed in this study fall within the range reported by recent studies. For example, the studies cited earlier in Connecticut, Virginia, and New Mexico, conducted in conjunction with the Council of Chief School Officers (CCSSO) and its twelve state NCLB Cost Consortium, found local school costs ranging from \$30 to \$560 per student. However, the CCSSO studies looked at NCLB costs for a wide range of activities organized under eight (8) different components. The LJSHS study, in contrast, examined only those costs attributed to raising the performance of all students on Pennsylvania's statewide test. Some the activities conducted during the LJSHS study, however, would seem to fall within Component 1, "Standards and Assessments" of the CCSSO studies. This component included activities such as development of materials, planning, and development of local assessments, all of which were part of the LJSHS study. However, none of the components identified within the CCSSO studies include costs for instruction or other related costs such as room utilization, utilities, equipment or supplies.

Where does the present study fit within other attempts to estimate the costs for NCLB compliance? The results of this study have revealed additional costs not addressed in other studies. Studies like that conducted in Ohio, which focused on remediation costs, and the CCSSO studies, which looked at a broad range of NCLB compliance requirements, both ignore the fact that all students, not just "at-risk" students, require preparation in taking statewide exams. This preparation, especially for the writing assessment, is very labor intensive. In the LJSHS study, teachers developed writing

assessments which paralleled Pennsylvania's statewide writing exam. In addition to training, this strategy required many teacher hours to score student papers. Teachers conducted assessments during each quarter. This same strategy was used to prepare student for the statewide reading exam as well. While it might be argued that the LJSHS approach was more intensive than required, it still reveals an important cost born by districts as well as costs born by teachers and administrators. These are NCLB costs that other studies have not adequately explored.

Intervention Costs: Faculty

A key finding revealed in this study was the large cost born by faculty members through uncompensated time spent outside of class. This cost, which amounted to \$358 per student for the three years of the intervention, is one that has not been discussed in other estimates for NCLB compliance. It is particularly important because this cost is not under direct control of local school districts. Should teachers choose not to bear this cost, what are the implications for students? While faculty at Liberty Junior-Senior High School were willing to spend personal time to meet the intervention needs, in other school districts this could become a collective bargaining issue. In many districts, including Liberty School District, collective bargaining agreements include supplemental pay for special education teachers who must write Individual Education Plans. It would be easy to speculate that interventions, similar to those used in this study, might result in contractual changes forcing schools to bear some of this cost. In any event, future cost estimates for NCLB should consider this "hidden" cost. Even in districts that do not use an approach precisely like that used at LJSHS, it is likely that teachers and administrators are bearing some of the cost for meeting the requirements of NCLB.

Intervention Costs: Federal Government

The primary impetus behind lawsuits that challenge the federal government and the legality of NCLB, such as that filed by the state of Connecticut (NSBA, 2005), is a belief that the law represents another unfunded mandate which is prohibited within the NCLB law itself. The results of this study seem to support this contention. The three year district cost of \$352,264 is far less than the \$ 907,000 it received from the federal

government over the three years of the intervention. However, very little of this federal money was directed at intervention activities. The federal government funded only 1.1 % of the total estimated intervention cost. It should be noted, however, by addressing prevention rather than remediation, LJSHS was not eligible for money made available under NCLB. In Pennsylvania, funds are available for those schools that have failed to make Adequate Yearly Progress. Known as "supplemental educational services," these funds are to be used to cover the cost of tutoring for low income families within schools under corrective action. Also, federal monies provided to school under Title I must be directed toward meeting the goals of NCLB in schools that fail to make Adequate Yearly Progress. Currently, no federal dollars are made available to schools to address student needs of all students before failure on statewide tests.

Resource Allocation

As expected, the primary resource used in this study was personnel, accounting for nearly 98% of the total three year cost. The single most costly resource added was an additional English teacher accounting for 39% of the overall cost for in-school work. If after-school work is added, the percentage for the additional teacher increases to 44% of the total three year cost. The remaining resources were obtained through reallocation of existing resources including personnel, space, equipment, and supplies. The after-school work contributed by teachers was classified as reallocated resources, although a strong argument could be made that it was a new resource.

In terms of resource allocation, the results of this study reveal an inherent conflict within NCLB that may force schools to confront a difficult choice. As the year 2014 approaches and schools face the difficult task of moving increasing numbers of the most resistant students above the proficiency threshold, will schools choose to divert resources into remediation and away from other programs? If the decisions made at LJSHS are predictive, the answer is "yes." From the district's viewpoint, the intervention costs were not sustainable. Despite its success in moving students to higher level of achievement, the strategies employed in this study were not able to move all students to proficiency. This fact, coupled with increasing budget pressure from other sources, caused LJSHS administrators to reduce staffing in the English Department to pre-intervention levels

following the 2004-05 school year. Subsequently, the district's tutoring program, which had primarily served to assist students with homework, was redirected to target specifically students who had scored nonproficient on the PSSA. In addition, training began for special education teachers who had not participated in the intervention. Thus, this study has demonstrated that it will be difficult for small rural schools to sustain the cost of additional resources such as teachers or aids. These schools will experience strong pressure to divert resources from other educational goals to that have helping those students who have failed to reach proficiency.

Suggestions for Future Research

The results of this study reveal many other questions which deserve our attention as researchers attempt to determine the true cost for NCLB. Highly skilled educators, such as the Lead Teacher in this study, are critical and possibly limiting resources that would be required if schools are to move large numbers of students to proficiency. It is possible that the Lead teacher in this study was wholly responsible for any improvement that was observed. Consider that she taught Group C in both seventh and eighth grade and she taught group D in seventh grade. For the two groups that showed the most improvement, she was responsible for three years of their four years of instruction. The availability of such highly trained personnel might be a limiting factor in raising student achievement since such faculty may not be widely available.

This study examined one approach to raising student achievement within the core curriculum. Future studies need to look at other approaches to raising student performance which might include enrichment and remediation strategies. What is the right mix of prevention and remediation? Especially critical will be identifying a true cost for moving students with disabilities to proficiency. Once this cost is known, the proper federal funding role in meeting the demands of NCLB might be determined.

Although the NCLB law has as its goal to raise the achievement of all students, sanctions take effect only when students fail to reach proficiency. Future studies should focus on whether or not schools are diverting resources from high achieving students to support remediation for nonproficient students.

This study has utilized specific school level cost data to estimate the cost for compliance with one aspect of the NCLB law, namely, that of raising achievement in reading and writing. The study has revealed conflicts and ambiguities within NCLB and spawned further questions which, once answered, will help us to understand the impact of NCLB.

Considering the existent bipartisan support for No Child Left Behind, it is unlikely that this law will change significantly in the immediate future. Thus, schools will continue to search for the resources necessary for implementation of this law. It appears that schools will not be able to rely on the federal government to help with these costs. In the year following passage of NCLB federal funding rose by 18% for schools. The next year federal funding for schools rose by only 1.6%. In 2005, federal funding actually declined by 1.2% and, as of April 2006, it was scheduled to decline by an additional 3.8%. Since federal funds are aimed primarily at the poorest performing students, this reduction in federal funding will draw resources away from those students with the most need. This will put more pressure on schools, especially smaller rural schools, to divert resources currently benefiting all students to only "at-risk" learners. How adept are school administrators at making resource allocation decisions? As discussed earlier, Hartman (1998) noted a disconnect in public school resource allocation decisions and results and cited three reasons for this disconnect; lack of incentive, lack of knowledge, and lack of public interest in specific student results. NCLB has certainly provided incentive for schools to make wiser resource allocation decisions. It has also succeeded in drawing attention to student results and accountability. However, whether or not administrators possess the knowledge to make more effective resource allocation decisions remains a critical area for future research.

Limitations

This study was designed to provide a more detailed examination of the costs for NCLB compliance than the broad estimates that were released during the introduction of this federal law. However, in seeking to provide such detail it must be remembered that this study was limited to a single school district. Thus, while this approach has provided school level examination of NCLB costs, its results are difficult to generalize to other

districts. Specifically, Liberty School District's small size, average SAT scores, lack of diversity, and school culture must be considered in projecting both the costs and intervention effects to other districts. Furthermore, Liberty School District was already making AYP before the intervention strategies were implemented.

Every effort was made in this study to include only those costs which were directed at NCLB compliance and to exclude costs which would have been incurred by constituents even in the absence of NCLB. Since the Liberty JSHS was already committed to improving reading and writing, the primary added NCLB costs were associated with enhancing student test taking skills in the form of quarterly assessments. It is possible that such an approach is more effective with students who are already performing well. Indeed, the results for Groups C and D seem to support this notion. Here the greatest improvements were seen in students who were already proficient. The strategies used in this study are probably more appropriate for high school students than elementary students where acquisition of general knowledge is more important than acquisition of test taking skills.

Since scores for the PSSA were not reported by individual student for all students in the study, the group results must be interpreted cautiously. For group data it was impossible to know the extent to which the students taking the Reading PSSA in fifth grade matched those taking the Reading PSSA again in eighth grade. While Groups C and D did provide individual score comparisons, these students represented only one-third of all students exposed to intervention strategies. Further, Group D did not take the Writing PSSA in ninth grade. Finally, the fact that Group C was exposed to the Lead Teacher during both seventh and eighth grade, may have favorably biased their PSSA scores.

This study attempted to isolate those interventions directly related to NCLB compliance from those aimed at general improvement in Reading and Writing skills. However, it is likely that the PSSA results used to measure intervention effect, were also influenced by changes in instructional methods and content that would have been implemented even in the absence of NCLB.

Bibliography

- Allison, G. T. (1971). *Essence of decisions*. Boston: Little, Brown and Company.
- Augenblick, J., Pailich, R., Silverstein, J. & Brown, A. (2005) The Cost of Fulfilling the Approved Procedural Requirements of the No Child Left Behind Act in New Mexico, Denver, CO.
- Berne, R. & Stiefel, L. (1994). Measuring equity at the school level: The finance perspective. *Educational Evaluation and Policy Analysis*. 16(4), pp. 59–76.
- Boyd, W. (1999) Paradoxes of educational policy and productivity. *Educational Policy*, 13(2), pp. 227-250 .
- Boyd, W. L., & Hartman, W. T. (1998) The politics of educational productivity, in *Resource Allocation and Productivity in Education, Theory and Practice*, W. T. Hartman & W. L. Boyd (Eds.). Westport, CN: Greenwood Press.
- Boyd, W. L. (1988). How to reform schools without half trying: Secrets of the Reagan administration. *Educational Administration Quarterly*, 24 (3), pp. 299-309.
- Boyd, W. L. (1987). Public education's last hurrah?: Schizophrenia, amnesia, and ignorance in school politics. *Educational Evaluation and Policy Analysis*, 9(2), pp. 85-100.
- Brinson, V.R.C. & Mellor, L. (2005) *How Are High Performing Schools Spending Their Money?* A Case Study. Report at American Education Finance Association, 2005, in Louisville, PA.
- Center for Rural Pennsylvania (n.d.) Rural/Urban PA. Retrieved April 9, 2004, from http://www.ruralpa.org/rural_urban.html
- Chambers, J.(1999). *Measuring resources in education:from accounting to the resource cost model approach*. National Center for Education Statistics Working Paper No. (1999-16), Washington, D.C.:U.S. Department of Education.
- Chubb, J. E., & Moe, T. M. (1990). *Politics, markets, and America's schools*. Washington, D.C.:Brookings Institution.
- Coleman, J.S. et al. (1966). *Equality of educational opportunity*. Washington, D.C.:U.S. Department of Health, Education, and Welfare.
- Commonwealth Educational Policy Institute (2004). *The Virginia standards of learning*. Retrieved March 15, 2004, from www.cepionline.org/policy_issues/saa/va_standards.html

- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage publications, pp 64-65.
- Darling-Hammond, L. (1997) *Doing what matters most: Investing quality teaching*. New York: National Commission on Teaching and America's Future.
- Guthrie, J. W. (2004) No Child Left Behind price tag. Letter to editor in *Education Week*, 23(22), pp. 30.
- Hadderman, M. (1999) *Equity and Adequacy in School Finance*. ERIC Digest. Eugene, OR: ERIC Clearinghouse on Educational Management, pp. 2.
- Hanushek, E. A. (1997). Assessing the effects of school resources on student performance: Fan update. *Educational Evaluation and Policy Analysis*, 19(2): 141–164.
- Hanushek, E. A. (2004). In Hoff, David, J. Debate Grows on True Costs of School Law: No Child Left Behind Act Prompts Stat Concerns, *Education Week*, 23(21), pg. 22
- Hartman, W. T. (1998) Understanding resource allocation in high schools. Chapter in Hartman, W.T. & Boyd, W. L. (eds.) *Resource Allocation and Productivity in Education: Theory and Practice*, Westport, CT: Greenwood Press, pp 129-153.
- Hartman, W. T. (1992) *Public School Finance*. University Park , PA: The Pennsylvania State University, pp 44-47.
- Hess, F. M. (2004). The case for being mean. *Educational Leadership*, Alexandria, VA: Association for Supervision and Curriculum Development, 61(3):22-26
- Hoff, D. J. (2004) *Debate grows on true cost of school law: NCLB Act prompts state concerns*. *Education Week*, 23(21), pp. 22.
- House, E. R. (1991). Big policy, little policy. *Educational Researcher*, 21, pp. 21-26.
- Hummel-Rossi, B. & Ashdown, J. (2002). The state of cost-benefit and cost-effectiveness analyses in education. *Review of Educational Research*, 72(1), pp. 1-30.
- Kirst, M. (1984). *Who Controls our Schools?* New York: W.H. Freeman & Company
- Information Legislative Service Bulletin (2004a). *Governor presents 2004-05 budget*. New Cumberland, PA: Pennsylvania School Boards Association, 42(6): pg 1.
- Information Legislative Service Bulletin (2004b). *NCLB opt-out consequences for states and schools outlined*. New Cumberland, PA: Pennsylvania School Boards Association, 42(11): pp.6-7.

- Ladd, H. F. & Hansen, J. S., Eds. (1999) *Making money matter: Financing America's schools*. National Academic Press: Washington, D.C.
- Levin, H. M. (1997). Raising school productivity: An x-efficiency approach. *Economics of Education Review*, 16(3), 303-310
- Levin, M. L. (1991). Cost-effectiveness at quarter century. In M. W. McLaughlin and D. C. Phillips (Eds.), *Evaluation and education at quarter century* (pp. 189-209, 90th Yearbook of the National Society for the Study of Education). Chicago: University of Chicago Press.
- Levin, H. M. (1983). *Cost-effectiveness: A primer*. Beverly Hills, CA: Sage Publications.
- Levin, H.M. (1975) Cost-effectiveness analysis in evaluation research, In M. Guttentag & E.L. Struenings (Eds.), *Handbook of evaluation research*. (Vol. 2, pp. 89-122). Beverly Hills, CA: Sage Publications.
- Levin, H. M and McEwan, P. J. (2002). Introduction, In H. M. Levin and P. J. McEwan (Eds.) *Cost effectiveness and educational policy* (pp. 3-4, 2002 Yearbook of the American education Finance Association). Larchmont, NY: Eye on Education.
- Levin, H. M. and McEwan, P.J. (2001) *Cost Effectiveness Analysis*. Thousand Oaks, CA: Sage Publications, Inc
- Lipscomb, J., Weinstein, M. C., Torrance, G. W. (1996) Time preference. In M.R. Gold, L.B. Russell, J.E. Siegel, & M.C. Weinstein (eds.), *Cost-effectiveness in health and medicine* (pp. 214-246). New York: Oxford University Press.
- Mathis, W. J. (2002). No Child Left Behind: Costs and benefits. *Phi Delta Kappan International* 84(9), pp. 679. Retrieved on April 10, 2004 from www.pdkintl.org/kappan/k0305mat.htm
- McREL Database. (2002) *A History of Standards*. Retrieved February 13, 2004, from <http://www.mcrel.org/standards-benchmarks/docs/purpose.asp>
- Monk., D.H., & King, J.A. (1993) Cost analysis as a tool for education reform, In S.L. Jacobson & R. Berne (eds.), *Reforming education: The emerging systemic approach*. Thousand Oaks, CA: Corwin Press. (pp. 131-152)
- Murnane, R.J. & Nelson, R.R. (1984). Production and innovation when techniques are tacit: The case of education. *Journal of Economic Behavior and Organization*. 5, pp. 353-373.
- National Association of Secondary School Principals (2003) *K-12 Principals Guide to No Child Left Behind*, Educational Research Service: Arlington, VA, pp. 7-19.

- National School Boards Association (2005) Retrieved from http://www.nsba.org/site/doc_cosa.asp on September 9, 2005.
- No Child Left Behind Act of 2001, Title I, sec. 1001, Statement of Purpose;20 USC 6301.
- Natriello, G. (1998). *The new reagents high school graduation requirements: The curricular and instructional implications of the new standards estimating the resources necessary to meet the new standards*. Retrieved April 9, 2004 from <http://www.columbia.edu/~gjn6/cssrep2.html>
- No Child Left Behind Act of 2001, (2002) Pub. L. No. 107-110 Stat. 1425.
- Odden, A. and Archibald, S. (2001). *Reallocating resources: How to boost student achievement without asking for more*. Thousand Oaks, CA:Corwin Press, Inc.
- Odden, A. (1997). *How to rethink school budgets to support school transformation*. Arlington, VA: New American Schools.
- Odden, A. & Clune, W. (1995). Improving educational productivity and school finance. *Educational Researcher* 24(9), pp. 6-10.
- Patterson, J. & Alter, J. (2005) *NCLB Costs in Minnesota*, Office of the Legislative Auditor, Roseville:MN.
- Pennsylvania School Boards Association (2006), *2005 Pennsylvania School Facts and Figures*, Mechanicsburg:PA (www.psba.org)
- Picus., L.O. (2000). *How schools allocate and use their resources*. ERIC Digest 143, Clearinghouse on Education Management, University of Oregon:Eugene, Oregon.
- Picus, L.O. (1996). Tracking Dollars: Classroom Level Spending Comparisons. *School Business Affairs*. *School Business Affairs*, 62(6), 28-33.
- Ravitch, D. (1995) *National Standards in American Education: a citizen's guide*. Washington, D.C.:Brookings.
- Retiz, Matt (2006) unpublished D.Ed. dissertation, Department of Educational Leadership, The Pennsylvania State University, State College:PA.
- Resnick, M. A. (2004) Calculating the cost of NCLB. *NCLB action Alert*, National School Boards Association, Alexandria, VA, pp. 1-3.

- Rice, J. K. (2002). Cost analysis in education policy research: A comparative analysis across fields of public policy, In H. M. Levin and P. J. McEwan (Eds.) *Cost effectiveness and educational policy* (pp. 21-35, 2002 Yearbook of the American education Finance Association). Larchmont, NY: Eye on Education.
- Rothenburg, J. (1975) Cost-effectiveness analysis in evaluation research, In M. Guttentag & E.L. Struenings (Eds.), *Handbook of evaluation research*. (Vol. 2, pp. 89-122). Beverly Hills, CA: Sage Publications.
- Rubenstein, R. (2000). School-level resource allocation in the Chicago public schools. *Developments in School Finance*, Washington, D.C.: U.S. Department of Education, Office of Educational Research and Improvement, pp. 45-60.
- Shouse, R. (1996). Academic press and sense of community: Conflict and congruence in American high schools. In Aaron M. Pallas (Ed.), *Research in Sociology of Education and Socialization*, Greenwich, CT: JAI Press., pp. 173-202.
- Sternburg, J. (2005), *Cost of Implementing the Federal No Child Left Behind Act in Connecticut*, Connecticut State Department of Education.
- Weglinsky, H. (1997). *When money matters*. Princeton, N.J.: Educational Testing Service.

**Appendix A
Intervention Log
2001-02**

Date	Event/Activity	Participant	Time Min.	in Hrs.	Cost Factor	Activity Cost
April 2001	8th grade Reading PSSA taken (No intervention)	Class of 2005				
August 31, 2001	First official day of intervention w/start of veteran teacher w/expertise in standards & assmt.	Lead Teacher				
August 31-Sept. 5, 2001	Three meetings to discuss plans for PSSA prep and implementing local assessment keyed to PA Reading and Writing (Budget, materials, training, timeline)	Lead Teacher	250	4.2	\$55.20	\$230.00
		Principal	250	4.2	\$73.31	\$305.46
October 2001	9th grade Writing PSSA taken (No intervention)	Class of 2005				
October 8-12, 2001	7th grade local assmt. in Writing and Reading	Class of 2007				
	-Administration	Lead Teacher	84	1.4	\$55.20	\$77.28
	-Scoring, recording, storage, reporting		450	7.5	\$55.20	\$414.00
November 6, 2001	Meeting: Update status 7th grade assessments	Lead Teacher	20	0.3	\$55.20	\$18.40
December 2001	7th grade local assmt. in Writing and Reading	Class of 2007				
	-Administration	Lead Teacher	84	1.4	\$55.20	\$77.28
	-Scoring, recording, storage, reporting		550	9.2	\$55.20	\$506.00
January 16, 2002	Two veteran English teachers hired					
January 20, 2002	Inservice Day: Meeting to discuss vision for local assessments in Reading and Writing	Lead Teacher	90	1.5	\$55.20	\$82.80
		Principal	90	1.5	\$73.31	\$109.97
February 12-15, 2002	7th grade local assmt. in Writing and Reading	Lead Teacher	60	1.0	\$55.20	\$55.20
	-Administration		600	10.0	\$55.20	\$552.00
	-Scoring, recording, storage, reporting					
February 2002	Planning for proposed assessments	Principal	240	4.0	\$73.31	\$293.24
April 2002	8th grade Reading PSSA	Class of 2006				
February 13, 2002	Meeting to review plans for implementing local assessment 7-12 for PSSA Reading and Writing per August meeting.	Lead Teacher	45	0.8	\$55.20	\$41.40
		Principal	45	0.8	\$73.31	\$54.98
March 15, 2002	Inservice Meeting to discuss PSSA results and review implementation progress for local assmt.	Lead Teacher	35	0.6	\$300.42	\$175.25
		Principal	35	0.6	\$76.05	\$44.36
May 6-20, 2002	7th grade local assmt. in Writing and Reading	Class of 2007				
	-Administration	Lead Teacher	104	1.7	\$55.20	\$95.68
	-Scoring, recording, storage, reporting		750	12.5	\$55.20	\$690.00
	-Finalize portfolios	Total Time		63.0		
June 4, 2002 ¹	Meeting to review standards and PSSA prep (Title II comp \$150 each)	Lead Teacher	240	4.0	\$275.00	\$275.00
		Eng. 1	240	4.0	\$150.00	\$150.00
		Eng. 2	240	4.0	\$150.00	\$150.00
		Eng. 3	240	4.0	\$150.00	\$150.00
		Eng. 5	240	4.0	\$150.00	\$150.00

**Total In-School Costs
2001-02**

Principal	\$867
Eng. 1	\$0
Eng. 2	\$0
Eng. 3	\$0
Eng. 4	\$2,876
Eng. 5	\$0
Totals	\$3,743

Footnotes for 2001-02

1. This was after-school time paid for through Title II funds

Appendix A (continued)
Intervention Log
2002-03

Date	Event/Activity	Participant	Time		Cost Factor	Activity Cost
			Min.	Hrs.		
July -August, 2002	Planning for implementation of local assmt.7-12 for PSSA Reading and Writing (frequency, score conversion, rubrics, portfolio system, items need for workbooks, standards)	Lead Teacher	510	8.5	\$56.24	\$478.04
		Principal	120	2	\$76.05	\$152.10
August 29, 2002	Start of expanded English department (Grade 7) Lead teacher moves to 8th grade Memo to all English Department re: plans for assmts. in Reading and Writing for PSSA prepr	Principal	30	0.5	\$76.05	\$38.03
August 26, 2002	First meeting of expanded English Department -Discussion of assessment plan-Reading & Writing -Agree to one assmt. for each per quarter -Review of PSSA Writing & Reading rubrics -Scoring of sample papers with writing rubric	Lead Teacher	240	4	\$56.24	\$224.96
		Principal	240	4	\$76.05	\$304.20
		Eng. 1	240	4	\$52.71	\$210.84
		Eng. 2	240	4	\$56.39	\$225.56
		Eng. 3	240	4	\$41.83	\$167.32
		Eng. 5	240	4	\$45.12	\$180.48
		Eng.6	240	4	\$48.13	\$192.52
August 30, 2002	Analysis of PDE manual, The Local Assessment System for ideas on our own local assessment	Lead Teacher	120	2	\$56.24	\$112.48
August 29, 2002	Analysis of PSSA Reading exam -Collection of question stems in sel. response items -Correlation of PSSA to Chapter 4 standard bullets	Lead Teacher	200	3.3	\$56.24	\$187.47
September 3-6, 2002	Collection of PSSA released items & keys, copy and distribution to English Department	Lead Teacher	130	2.2	\$56.24	\$121.85
Sept. 3-12, 2002	Indiv. meetings with all Eng. faculty to model use of PSSA writing rubric, discuss implementation	Lead Teacher	200	3.3	\$56.24	\$187.47
		Eng. 1	35	0.6	\$52.71	\$30.75
		Eng. 2	42	0.7	\$56.39	\$39.47
		Eng. 3	42	0.7	\$41.83	\$29.28
		Eng. 5	42	0.7	\$45.12	\$31.58
		Eng. 6	42	0.7	\$48.13	\$33.69
September 8,2002	Memo to English Department re: Reading and Writing assessments	Principal	30	0.5	\$76.05	\$38.03
September 8, 2002	Design and preparation of 8th grade Reading PSSA	Lead Teacher	42	0.7	\$56.24	\$39.37
September 9,2002	Preparation of sample Reading open-ended task & rubric	Lead Teacher	75	1.3	\$56.24	\$70.30
September 15, 2002	Research data-collection methods for local assessment & reporting out to state and NCLB	Lead Teacher	120	2.0	\$56.24	\$112.48
September 23, 2002	Creation of grids for recording local PSSA assmt. data	Lead Teacher	80	1.3	\$56.24	\$74.99
September 24, 2002	Act 80 Day Meeting:Further planning and preparation	Lead Teacher	60	1	\$56.24	\$56.24
		Eng. 1	60	1	\$52.71	\$52.71
		Eng. 2	60	1	\$56.39	\$56.39
		Eng. 3	60	1	\$41.83	\$41.83
		Eng. 5	60	1	\$45.12	\$45.12
		Eng. 6	60	1	\$48.13	\$48.13
Sept. 23-Oct. 3	Locate, analyze, order PSSA Reading preparation manuals (PSSA Coach Workbooks)	Lead Teacher	180	3	\$56.24	\$168.72
September 3-30, 2002	Quarter 1 Reading and Writing local assessments 7-12	Lead Teacher	840	14	\$56.24	\$787.36
		Eng. 1	1170	19.5	\$52.71	\$1,027.85
		Eng. 2	900	15	\$56.39	\$845.85
		Eng. 3	875	14.6	\$41.83	\$610.02
		Eng. 5	1220	20.3	\$45.12	\$917.44
		Eng. 6	900	15	\$48.13	\$721.95
October 2002	9th grade Reading PSSA taken (two months intervention)	Class of 2006				

Appendix A (continued)
Intervention Log
2002-03

Date	Event/Activity	Participant	Time		Cost Factor	Activity Cost
			Min.	Hrs.		
October 11-12, 2002	Compiled list of question stems & content skills for Reading PSSA for all English faculty	Lead Teacher	130	2.2	\$56.24	\$121.85
October 14, 2002	Researched and collected Reading PSSA tasks for use in grades 7 & 8	Lead Teacher	90	1.5	\$56.24	\$84.36
October 14, 2002	Meeting to discuss local Reading assessment	Lead Teacher	42	0.7	\$56.24	\$39.37
		Principal	42	0.7	\$76.05	\$53.24
October 21, 2002	Memo reminder to staff re: PSSA review	Principal	20	0.3	\$76.05	\$25.35
October 23, 2002	Memo reminder to submit assessment results	Principal	15	0.3	\$76.05	\$19.01
October 30, 2002	Act 80 Day to discuss implementation issues with	Lead Teacher	150	2.5	\$56.24	\$140.60
		Eng. 1	150	2.5	\$52.71	\$131.78
		Eng. 2	150	2.5	\$56.39	\$140.98
		Eng. 3	150	2.5	\$41.83	\$104.58
		Eng. 5	150	2.5	\$45.12	\$112.80
		Eng. 6	150	2.5	\$48.13	\$120.33
November 11, 2002	Review local assessments issues: scoring, storage, lack of time for grammar, schedule, timeline, question stems)	Principal	150	2.5	\$76.05	\$190.13
November 11, 2002	Reviewed newly received Reading Coach workbooks to divide Reading tasks among Eng. based on curriculum	Lead teacher	120	2.0	\$56.24	\$112.48
November 1-20, 2002	Quarter 2 Reading and Writing local assessments 7-12	Lead Teacher	960	16.0	\$56.24	\$899.84
		Eng. 1	1128	18.8	\$52.71	\$990.95
		Eng. 2	840	14.0	\$56.39	\$789.46
		Eng. 3	960	16.0	\$41.83	\$669.28
		Eng. 5	1250	20.8	\$45.12	\$940.00
		Eng. 6	920	15.3	\$48.13	\$737.99
January 19, 2003	Preparation of local assessment results for board	Principal	120	2.0	\$76.05	\$152.10
January 20, 2003	Inservice: Meeting to discuss local assessment results and implementation issues	Lead Teacher	120	2.0	\$56.24	\$112.48
		Eng. 1	120	2.0	\$52.71	\$105.42
January 20, 2003	Inservice: Meeting to discuss local assessment results and implementation issues	Eng. 2	120	2.0	\$56.39	\$112.78
		Eng. 3	120	2.0	\$41.83	\$83.66
		Eng. 5	120	2.0	\$45.12	\$90.24
		Eng. 6	120	2.0	\$48.13	\$96.26
February 10-28, 2003	Quarter 3 Reading and Writing local assessments 7-12	Lead Teacher	900	15.0	\$56.24	\$843.60
		Eng. 1	1200	20.0	\$52.71	\$1,054.20
		Eng. 2	720	12.0	\$56.39	\$676.68
		Eng. 3	840	14.0	\$41.83	\$585.62
		Eng. 5	1245	20.8	\$45.12	\$936.24
		Eng. 6	960	16.0	\$48.13	\$770.08
February 14, 2003	Act 80 Day					
	English Department meeting to discuss implementation and reporting for local assessment	Lead Teacher	30	0.5	\$300.42	\$150.21
		Eng. 1	30	0.5	\$56.24	\$28.12
		Eng. 2	30	0.5	\$52.71	\$26.36
		Eng. 3	30	0.5	\$56.39	\$28.20
		Eng. 5	30	0.5	\$41.83	\$20.92
		Eng. 6	30	0.5	\$45.12	\$22.56
March 3, 2003	Memo reminder to submit assessment results	Principal	15	0.3	\$76.05	\$19.01
March 4, 2003	Memo to Lead Teacher re: assessments report formats, and results	Principal	20	0.3	\$76.05	\$25.35
March 12, 2003	Compilation/distribution of PSSA results compared to local results. (For Eng. faculty review)	Principal	45	0.8	\$76.05	\$57.04
March 17, 2003	Memo: Instructions for accessing practice PSSA on PDE	Principal	45	0.8	\$76.05	\$57.04

Appendix A (continued)
Intervention Log
2002-03

Date	Event/Activity	Participant	Time Min.	in Hrs.	Cost Factor	Activity Cost
March 25, 2003	Act 80 Meeting to review assessment results, workbooks, upcoming PSSA	Lead Teacher	60	1.0	\$56.24	\$56.24
		Eng. 1	60	1.0	\$52.71	\$52.71
		Eng. 2	60	1.0	\$56.39	\$56.39
		Eng. 3	60	1.0	\$41.83	\$41.83
		Eng. 5	60	1.0	\$45.12	\$45.12
		Eng. 6	60	1.0	\$48.13	\$48.13
March 25, 2003	Memo:Reminder to submit data	Principal	15	0.3	\$76.05	\$19.01
March 26, 2003	Meeting to review standards and strategies for PSSA prep (After school. Title II comp \$75 each)	Lead Teacher	120	2.0	\$56.24	\$112.48
		Eng. 1	120	2.0	\$52.71	\$105.42
		Eng. 2	120	2.0	\$56.39	\$112.78
		Eng. 3	120	2.0	\$41.83	\$83.66
		Eng. 5	120	2.0	\$45.12	\$90.24
		Eng. 6	120	2.0	\$48.13	\$96.26
April 2003	8th grade Reading PSSA taken	Class of 2007				
April 24, 2003	Memo reminder to complete assessments and report final results in standard format.	Principal	30	0.5	\$76.05	\$38.03
May 4-28, 2003	Quarter 4 Reading and Writing local assessments 7-12	Lead Teacher	900	15.0	\$56.24	\$843.60
		Eng. 1	1300	21.7	\$52.71	\$1,142.05
		Eng. 2	1050	17.5	\$56.39	\$986.83
		Eng. 3	945	15.8	\$41.83	\$658.82
		Eng. 5	1280	21.3	\$45.12	\$962.56
		Eng. 6	960	16.0	\$48.13	\$770.08
June 2003	Inservice meeting to troubleshoot for local assessment and PSSA prep activities	Lead Teacher	30	0.5	\$56.24	\$28.12
		Eng. 1	30	0.5	\$52.71	\$26.36
		Eng. 2	30	0.5	\$56.39	\$28.20
		Eng. 3	30	0.5	\$41.83	\$20.92
		Eng. 5	30	0.5	\$45.12	\$22.56
		Eng. 6	30	0.5	\$48.13	\$24.07
June 14, 2003	Development of board report on local assessment	Principal	120	2.0	\$76.05	\$152.10

Total In-School Costs
2002-03

Principal	\$1,340
Eng. 1	\$4,957
Eng. 2	\$4,100
Eng. 3	\$3,118
Eng. 4	\$6,045
Eng. 5	\$4,397
Eng. 6	\$3,683
Totals	\$27,640

Appendix A (continued)
Intervention Log
2003-04

Date	Event/Activity	Participant	Time in		Cost Factor	Activity Cost
			Min.	Hrs.		
August 27, 2003	Review PA reading rubric to combine w/McGraw Hill	Lead Teacher	45	0.8	\$56.71	\$42.53
August 28, 2003	Progress meeting on implementation of local assessment	Lead Teacher	30	0.5	\$56.71	\$28.36
	(Training, materials needed, timeline, changes)	Principal	30	0.5	\$76.20	\$38.10
August 29, 2003	Inservice: Meeting to plan for changes in local assessment (storage, transfer of info.)	Lead Teacher	75	1.3	\$56.71	\$70.89
		Eng. 1	75	1.3	\$52.83	\$66.04
		Eng. 2	75	1.3	\$55.60	\$69.50
		Eng. 3	75	1.3	\$43.72	\$54.65
		Eng. 5	75	1.3	\$47.44	\$59.30
		Eng. 6	75	1.3	\$55.60	\$69.50
August 28, 2003	Memo: Request Title V pay for Eng. faculty	Principal	45	0.8	\$76.20	\$57.15
	Materials development	Eng. 1				\$209.00
	Materials development	Eng. 2				\$209.00
September 2, 2003	Analysis of Gr. 8 PSSA results & district assmts.	Lead Teacher	45	0.8	\$56.71	\$42.53
	Analysis of predictive value of local scores					
September 5, 2003	Meeting to discuss implementation of local assessment	Lead Teacher	30	0.5	\$56.71	\$28.36
		Eng. 1	30	0.5	\$52.83	\$26.42
		Eng. 2	30	0.5	\$55.60	\$27.80
		Eng. 3	30	0.5	\$43.72	\$21.86
		Eng. 5	30	0.5	\$47.44	\$23.72
		Eng. 6	30	0.5	\$55.60	\$27.80
September 8, 2003	Meeting to discuss training for English Department	Lead Teacher	40	0.7	\$56.71	\$37.81
		Principal	40	0.7	\$76.20	\$50.80
September 7-26, 2003	Quarter 1 Reading and Writing local assessments 7-12 (includes admin., scoring, filing, reporting)	Lead Teacher	840	14.0	\$56.71	\$793.94
		Eng. 1	1160	19.3	\$52.83	\$1,021.38
		Eng. 2	1050	17.5	\$55.60	\$973.00
		Eng. 3	900	15.0	\$43.72	\$655.80
		Eng. 5	1275	21.3	\$47.44	\$1,008.10
		Eng. 6	960	16.0	\$55.60	\$889.60
September 16, 2003	Organization of assessment folders	Lead Teacher	45	0.8	\$56.71	\$42.53
September 17, 2003	Progress meeting on implementation of local assessment	Lead Teacher	30	0.5	\$56.71	\$28.36
		Principal	30	0.5	\$76.20	
September 24, 2003	Distribution of released PSSA items to English faculty	Lead Teacher	30	0.5	\$56.71	\$28.36
September 25, 2003	Meeting to discuss first quarter writing assessment	Lead Teacher	120	2.0	\$56.71	\$113.42
		Principal	120	2.0	\$76.20	
September 2003	Act 80 Meeting	Lead Teacher	45	0.8	\$56.71	\$42.53
		Eng. 1	45	0.8	\$52.83	\$39.62
		Eng. 2	45	0.8	\$55.60	\$41.70
		Eng. 3	45	0.8	\$43.72	\$32.79
		Eng. 5	45	0.8	\$47.44	\$35.58
		Eng. 6	45	0.8	\$55.60	\$41.70
September 30, 2003	Meeting to merge PSSA and PSAT writing activity	Lead Teacher/Eng.	30	0.5	\$56.71	\$28.36
		Eng. 2	30	0.5	\$55.60	\$27.80
October 1, 2003	Meeting to develop writing assessment activity	Lead Teacher/Eng.	45	0.8	\$56.71	\$42.53
		Eng. 3	45	0.8	\$43.72	\$32.79
October 6, 2003	Analysis of Reading in Content materials from IU 6	Lead Teacher	60	1.0	\$56.71	\$56.71
October 7, 2003	Development of conversion tool for PSSA to local grade	Lead Teacher	90	1.5	\$56.71	\$85.07
October 9, 2003	Conversion of newspaper article into Reading PSSA item	Lead Teacher	45	0.8	\$56.71	\$42.53
October 10, 2003	Plan and organize for subs to come Oct. 15	Principal	35	0.6	\$76.20	\$44.45

Appendix A (continued)
Intervention Log
2003-04

Date	Event/Activity	Participant	Time Min.	in Hrs.	Cost Factor	Activity Cost
October 14, 2003	Indiv. meetings w/ all Eng. faculty to practice using PSSA Writing rubric. Discuss conversion of PSSA four point to school grading scale	Lead Teacher	200	3.3	\$56.71	\$189.03
		Eng. 1	40	0.7	\$52.83	\$35.22
		Eng. 2	40	0.7	\$55.60	\$37.07
		Eng. 3	40	0.7	\$43.72	\$29.15
		Eng. 5	40	0.7	\$47.44	\$31.63
		Eng. 6	40	0.7	\$55.60	\$37.07
October 15, 2003	Three subs rotated to free English faculty for work on developing and scoring PSSA items	Lead Teacher	84	7.0	\$56.71	\$396.97
		Eng. 1	84	1.4	\$52.83	\$73.96
		Eng. 2	84	1.4	\$55.60	\$77.84
		Eng. 3	84	1.4	\$43.72	\$61.21
		Eng. 5	84	1.4	\$47.44	\$66.42
		Eng. 6	84	1.4	\$55.60	\$77.84
October 15, 2003		3 Subs (1/2 day ea.)			\$42.00	\$126.00
October 21, 2003	Reading PSSA review for seniors (PSSA Re-Take)	Lead Teacher	40	0.7	\$56.71	\$37.81
October 22, 2003	Development of Reading PSSA for Eng. 2	Lead Teacher	60	1.0	\$56.71	\$56.71
October 2003	9th grade Reading PSSA taken	Class of 2007				
October 2003	Act 80 meeting to discuss any concerns w/ local assessment, need for more embedded items	Lead Teacher	20	0.3	\$56.71	\$18.90
		Eng. 1	20	0.3	\$52.83	\$17.61
		Eng. 2	20	0.3	\$55.60	\$18.53
		Eng. 3	20	0.3	\$43.72	\$14.57
		Eng. 5	20	0.3	\$47.44	\$15.81
		Eng. 6	20	0.3	\$55.60	\$18.53
October 24, 2003	Development of Reading PSSA for Eng. 1	Lead Teacher	60	1.0	\$56.71	\$56.71
October 27, 2003	Development of Reading PSSA for Eng. 3	Lead Teacher	40	0.7	\$56.71	\$37.81
October 29, 2003	Development of Reading PSSA for Eng. 5	Lead Teacher	60	1.0	\$56.71	\$56.71
October 29, 2003	Read, copied, distributed Reading traits information	Lead Teacher	45	0.8	\$56.71	\$42.53
October 30, 2003	Development of Reading PSSA for Eng. 6	Lead Teacher	60	1.0	\$56.71	\$56.71
November 4, 2003	Preparation for Reading workshop	Lead Teacher	120	2.0	\$56.71	\$113.42
November 5, 2003	Preparation for Reading workshop	Lead Teacher	45	0.8	\$56.71	\$42.53
November 6, 2003	Workshop on enhancing Reading skills and preparing students for PSSA Reading. Discuss reading traits.	Lead Teacher	90	1.5	\$56.71	\$85.07
		Eng. 1	90	1.5	\$52.83	\$79.25
		Eng. 2	90	1.5	\$55.60	\$83.40
		Eng. 3	90	1.5	\$43.72	\$65.58
		Eng. 5	90	1.5	\$47.44	\$71.16
		Eng. 6	90	1.5	\$55.60	\$83.40
November 11, 2003	Development of Reading PSSA for Eng. 1	Lead Teacher	40	0.7	\$56.71	\$37.81
November 11, 2003	Scoring of PSSA's	Lead Teacher	40	0.7	\$56.71	\$37.81
November 25, 2003	Meeting to discuss scoring written portion of Reading PSSA based on Bloom's taxonomy.	Lead Teacher	40	0.7	\$56.71	\$37.81
		Eng. 1	40	0.7	\$52.83	\$35.22
		Eng. 2	40	0.7	\$55.60	\$37.07
		Eng. 3	40	0.7	\$43.72	\$29.15
		Eng. 5	40	0.7	\$47.44	\$31.63
		Eng. 6	40	0.7	\$55.60	\$37.07
December 8, 2003	Read, synthesized and distributed application of Bloom's	Lead Teacher	120	2.0	\$56.71	\$113.42
December 1-20, 2003	Quarter 2 Reading and Writing local assessments 7-12 (includes admin., scoring, filing, reporting)	Lead Teacher	920	15.3	\$56.71	\$869.55
		Eng. 1	1150	19.2	\$52.83	\$1,012.58
		Eng. 2	1150	19.2	\$55.60	\$1,065.67
		Eng. 3	920	15.3	\$43.72	\$670.37
		Eng. 5	1300	21.7	\$47.44	\$1,027.87
		Eng. 6	840	14.0	\$55.60	\$778.40

Appendix A (continued)
Intervention Log
2003-04

Date	Event/Activity	Participant	Time		Cost Factor	Activity Cost
			Min.	in Hrs.		
December 11, 2003	Meeting to discuss PSSA scoring	Lead Teacher &	30	0.5	\$56.71	\$28.36
		Eng. 3	30	0.5	\$43.72	\$21.86
December 12, 2003	Memo: Schedule Eng. meeting 1.05.04	Principal	15	0.3	\$76.20	\$19.05
January 6, 2004	Meeting to discuss issues and concerns about implementation of quarterly assessments	Principal	45	0.8	\$76.20	\$57.15
		Lead Teacher	45	0.8	\$56.71	\$42.53
		Eng. 1	45	0.8	\$52.83	\$39.62
		Eng. 2	45	0.8	\$55.60	\$41.70
		Eng. 3	45	0.8	\$43.72	\$32.79
		Eng. 5	45	0.8	\$47.44	\$35.58
		Eng. 6	45	0.8	\$55.60	\$41.70
January 8, 2004		Researched Reading PSSA's for Eng. 3	Lead Teacher	45	0.8	\$56.71
January 2004	Inservice Meeting	Lead Teacher	90	1.5	\$56.71	\$85.07
		Eng. 1	90	1.5	\$52.83	\$79.25
		Eng. 2	90	1.5	\$55.60	\$83.40
		Eng. 3	90	1.5	\$43.72	\$65.58
		Eng. 5	90	1.5	\$47.44	\$71.16
		Eng. 6	90	1.5	\$55.60	\$83.40
February 5, 2004	Finished developing Reading PSSA for Eng. 3	Lead Teacher	30	0.5	\$56.71	\$28.36
February 25, 2004	Meeting to discuss status of PSSA asmt.	Lead Teacher	45	0.8	\$56.71	\$42.53
		Principal	45	0.8	\$76.20	\$57.15
February 27, 2004	Discussion of recent PSSA local assessment results	Lead Teacher	30	0.5	\$56.71	\$28.36
Feb. 16-Mar. 12, 2004	Quarter 3 Reading and Writing local assessments 7-12 (includes admin., scoring, filing, reporting)	Lead Teacher	940	15.7	\$56.71	\$888.46
		Eng. 1	1100	18.3	\$52.83	\$968.55
		Eng. 2	1050	17.5	\$55.60	\$973.00
		Eng. 3	960	16.0	\$43.72	\$699.52
		Eng. 5	1300	21.7	\$47.44	\$1,027.87
		Eng. 6	840	14.0	\$55.60	\$778.40
March 8, 2004	Development of Reading PSSA item for Eng. 2	Lead Teacher	45	0.8	\$55.60	\$41.70
March 11, 2004	Development of Reading PSSA item for Eng. 2	Lead Teacher	30	0.5	\$56.71	\$28.36
May 2-28, 2004	Quarter 4 Reading and Writing local assessment 7-12 (includes admin., scoring, filing, reporting)	Lead Teacher	1020	17.0	\$56.71	\$964.07
		Eng. 1	840	14.0	\$52.83	\$739.62
		Eng. 2	900	15.0	\$55.60	\$834.00
		Eng. 3	900	15.0	\$43.72	\$655.80
		Eng. 5	1250	20.8	\$47.44	\$988.33
		Eng. 6	840	14.0	\$55.60	\$778.40
April 23, 2004	Development of embedded PSSA item for Eng. 1	Lead Teacher	45	0.8	\$56.71	\$42.53
April 24, 2004	Memo: Reminder to submit data and summary of results	Principal	15	0.3	\$76.20	\$19.05
April 2004	8th grade Reading PSSA taken	Class of 2008				
May 24, 2004	Meeting to discuss local assessment results	Lead Teacher	60	1.0	\$56.71	\$56.71
		Principal	60	1.0	\$76.20	\$76.20
June 4, 2004	Inservice meeting to do year end review of PSSA prep and local assessment activities	Lead Teacher	60	1.0	\$56.71	\$56.71
		Eng. 1	60	1.0	\$52.83	\$52.83
		Eng. 2	60	1.0	\$55.60	\$55.60
		Eng. 3	60	1.0	\$43.72	\$43.72
		Eng. 5	60	1.0	\$47.44	\$47.44
		Eng. 6	60	1.0	\$55.60	\$55.60

Appendix A (continued)
Intervention Log
2003-04

Date	Event/Activity	Participant	Time in		Cost Factor	Activity Cost
			Min.	Hrs.		
May 2004	Preparation of materials for June 4 meeting	Principal	45	0.8	\$76.20	\$57.15
June 2004	Analysis of local assessment data	Principal	120	2.0	\$76.20	\$152.40
June 2004	Development of board report on local assessment	Principal	60	1.0	\$76.20	\$76.20
June 2, 2004	Staff reduction back to five English teachers Official end of intervention.					
		Total Hours		519.5		

Total In-School Costs
2003-04

Principal	\$895
Eng. 1	\$4,287
Eng. 2	\$4,447
Eng. 3	\$3,187
Eng. 4	\$6,219
Eng. 5	\$4,541
Eng. 6	\$3,798
Totals	\$27,376

Appendix B

1999 Writing Score Reportin for PSSA NUMBER AND PERCENTAGE OF GRADE 6 STUDENTS SCORING AT EACH SCORE POINT														
	Excellent			Good		Fair		Weak		Poor		NonScored		
MODE	12	11	10	9	8	7	6	5	4	3	2	NS	OP	TOTAL
NARRATIVE														
School No.	0	0	0	1	9	8	2	1	0	0	0	0	0	21
%	0%	0%	0%	5%	43%	38%	10%	5%	0%	0%	0%	0%	0%	100%
District No.	0	0	0	1	9	8	2	1	0	0	0	0	0	21
%	0%	0%	0%	5%	43%	38%	10%	5%	0%	0%	0%	0%	0%	100%
State %	0%	1%	5%	9%	34%	18%	22%	5%	4%	0%	0%	1%	0%	100%
INFORMATIONAL														
School No.	0	0	0	0	10	9	4	1	0	0	0	0	0	24
%	0%	0%	0%	0%	42%	38%	17%	4%	0%	0%	0%	0%	0%	100%
District No.	0	0	0	0	10	9	4	1	0	0	0	0	0	24
%	0%	0%	0%	0%	42%	38%	17%	4%	0%	0%	0%	0%	0%	100%
State %	0%	1%	3%	8%	35%	19%	23%	5%	4%	0%	0%	1%	0%	100%
PERSUASIVE														
School No.	0	0	0	0	7	10	5	1	0	0	0	0	0	23
%	0%	0%	0%	0%	30%	43%	22%	4%	0%	0%	0%	0%	0%	100%
District No.	0	0	0	0	7	10	5	1	0	0	0	0	0	23
%	0%	0%	0%	0%	30%	43%	22%	4%	0%	0%	0%	0%	0%	100%
State %	0%	0%	2%	6%	31%	20%	27%	7%	5%	0%	1%	1%	0%	100%
TOTAL														
School No.	0	0	0	1	26	27	11	3	0	0	0	0	0	68
%	0%	0%	0%	1%	38%	40%	16%	4%	0%	0%	0%	0%	0%	100%
District No.	0	0	0	1	26	27	11	3	0	0	0	0	0	68
%	0%	0%	0%	1%	38%	40%	16%	4%	0%	0%	0%	0%	0%	100%
State %	0%	1%	3%	8%	34%	19%	24%	26%	4%	0%	1%	1%	0%	100%

* A score of 7 is considered to be the minimal level of writing competence.

Appendix C

Classification of Ingredients Using Concentric Circle Model			
Ingredients	CCM Category	N=New R=Reallocated	Source
Personnel			
Substitutes	1	R	1
Additional Teacher	1	N	
Lead Teacher	1	R	1
Classroom Teachers	1	R	1
Administrative	3	R	3
Facilities			
Classrooms	5	R	2
Library	5	R	2
Writing Lab	5	R	2
Office	3	R	3
Materials & Equip.			
Workbooks	2	N	
Computer Technology	2	R	2
Paper	2	R	2
Ink Cartridges	2	R	2
Copier Costs	2	R	2
Client Inputs			
Parents	N/A	N/A	N/A
Students	N/A	N/A	N/A
Other Inputs			
At Home Grading	2	N	N/A

Key to CCM Categories

- 1-Teacher and Students in Classroom
- 2- School-Based Instructional Support
- 3- School-Based Operations Support

- 4- District-Level Instructional Support
- 5- District-Level Operations Support
- 6- Other District Programs

Appendix D

Personnel Cost Tables

Personnel costs were a product of each teacher's (or administrator's) hourly rate, which included salary and benefits, and the hours each worked on activities directly related to the intervention. Appendix D shows the hourly rates for each year along with the in-school hours and after-school hours worked during each year. The hourly rate for Teacher # 6 is not shown because her complete salary was attributed to intervention activities.

Hourly Rates				In-School Hours			
Teacher	Year 1	Year 2	Year 3	Teacher	Year 1	Year 2	Year 3
1	\$51.70	\$52.71	\$52.83	1	0.0	94.1	89.3
2	\$55.32	\$56.39	\$55.60	2	0.0	72.7	88.0
3	\$39.26	\$41.83	\$43.72	3	0.0	74.5	80.2
4	\$55.20	\$56.24	\$56.71	4	52.1	107.5	120.6
5	\$54.89	\$45.12	\$47.44	5	0.0	97.5	105.3
6	\$50.13	\$48.13	\$55.60	6	0.0	76.5	75.1
Admin.	\$73.31	\$76.05	\$76.20	Admin.	15.4	17.6	13.4

After-School Hours			
Teacher	Year 1	Year 2	Year 3
1	0.0	107.0	120.0
2	0.0	290.0	280.0
3	0.0	255.0	240.0
4	225.0	292.0	295.0
5	0.0	275.0	275.0
6	0.0	175.0	190.0
Admin.	6.0	7.5	11.0

Appendix E

Facilities Costs

The tables below show the progression of calculations leading to final costs for facilities. The "New Constructions Costs" chart shows annual cost for renovations completed in 1997. This cost was used to calculate the "Facility Costs per Sq. Foot." This cost per square foot was then applied to each of the spaces used during the intervention to find the "Yearly Cost Per Space." Finally, the "Hourly Cost Per Space" was calculated and applied to the hours each spaced was used to determine facilities costs for each year. The final costs for facilities for each year are shown below

New Construction Costs	
Total New Construction Cost	\$4,536,000
District Share (79%)	\$3,583,440
Govt. Share (21%)	\$952,560
Annual Cost	\$113,400

Facility Costs per Sq. Foot		
Year	Total Cost	Per Square Foot Cost
2001-02	\$120,912	\$2.78
2002-03	\$119,023	\$2.74
2003-04	\$116,434	\$2.68

Yearly Cost Per Space (Cost per square foot x square footage per room)						
Year	Cost Per Sq. Foot	New Classroom 800 sq. ft.	Existing Classroom 925 sq. ft.	Writing Lab 1200 sq. ft.	Library 2800 sq. ft.	Conference Room 1450 sq. ft.
2001-02	\$2.78	\$2,224	\$2,572	\$3,336	\$7,784	\$4,031
2002-03	\$2.74	\$2,192	\$2,535	\$3,288	\$7,672	\$3,973
2003-04	\$2.68	\$2,144	\$2,479	\$3,216	\$7,504	\$3,886

Hourly Cost Per Space (Yearly Room Cost for 1196 Hours per Year)					
Year	New Classroom	Existing Classroom	Writing Lab	Library	Conf. Room
2001-02	\$1.86	\$2.15	\$2.79	\$6.51	\$3.37
2002-03	\$1.83	\$2.12	\$2.75	\$6.41	\$3.32
2003-04	\$1.79	\$2.07	\$2.69	\$6.27	\$3.25

Appendix E (Cont.)

2001-02 Facilities Cost Best Estimate

	Eng. 1	Eng. 2	Eng. 3	Eng. 4	Eng. 5	Eng. 6	Admin.	Tot Cost	District	Govt.	
Office	\$3.37										
Hours Used							15.4				
Cost Per Year By User							\$51.90	\$51.90	\$41.00	\$10.90	
Existing Classrooms	\$2.15										
Hours Used				42.3							
Cost Per Year By User				\$90.95				\$90.95	\$71.85	\$19.10	
New Classrooms	\$1.86										
Hours Used											
Cost Per Year By User											
Writing Lab	\$2.79										
Hours Used											
Cost Per Year By User											
Library	\$6.51										
Hours Used				2.4							
Cost Per Year By User				\$15.62				\$15.62	\$12.34	\$3.28	
Cost for All Facilities-Best Estimate								\$158	\$125	\$33	

2002-03 Facilities Costs Best Estimate

	Eng. 1	Eng. 2	Eng. 3	Eng. 4	Eng. 5	Eng. 6	Admin.	Tot Cost	District	Govt.	
Office	\$3.32										
Hours Used							27.8				
Cost Per Year By User							\$92.30	\$92.30	\$72.91	\$19.38	
Existing Classrooms	\$2.12										
Hours Used			41.4			42.2					
Cost Per Year By User			\$87.77			\$89.46		\$177.23	\$140.01	\$37.22	
New Classrooms	\$1.83										
Hours Used	66.6	34.0		80.5	56.0						
Cost Per Year By User	\$121.88	\$62.22		\$147.32	\$102.48			\$433.89	\$342.78	\$91.12	
Writing Lab	\$2.75										
Hours Used	5.6	16.8	11.2	2.8	22.4	11.2					
Cost Per Year By User	\$15.40	\$46.20	\$30.80	\$7.70	\$61.60	\$30.80		\$192.50	\$152.08	\$40.43	
Library	\$6.41										
Hours Used	8.4	8.4	8.4	11.0	5.6	9.6					
Cost Per Year By User	\$53.84	\$53.84	\$53.84	\$70.51	\$35.90	\$61.54		\$329.47	\$260.28	\$69.19	
Cost for All Facilities-Best Estimate								\$1,225	\$968	\$257	

Appendix E (Cont.)

2003-04 Facilities Cost Best Estimate

	Eng. 1	Eng. 2	Eng. 3	Eng. 4	Eng. 5	Eng. 6	Admin.	Tot Cost	District	Govt.	
Office	\$3.25										
Hours Used							18.1				
Cost Per Year By User							\$58.83	\$58.83	\$46.47	\$12.35	
Existing Classrooms	\$1.79										
Hours Used			44.6			46.1					
Cost Per Year By User			\$79.83			\$82.52		\$162.35	\$128.26	\$34.09	
New Classrooms	\$2.07										
Hours Used	65.7	45		72.2	67.9						
Cost Per Year By User	\$136.00	\$93.15		\$149.45	\$140.55			\$519.16	\$410.13	\$109.02	
Writing Lab	\$2.69										
Hours Used	5.6	22.4	14	2.8	14	8.4					
Cost Per Year By User	\$15.06	\$60.26	\$37.66	\$7.53	\$37.66	\$22.60		\$180.77	\$142.81	\$37.96	
Library	\$6.27										
Hours Used	5.6	8.4	5.6	11	5.6	5.6					
Cost Per Year By User	\$35.11	\$52.67	\$35.11	\$68.97	\$35.11	\$35.11		\$262.09	\$207.05	\$55.04	
Cost for All Facilities-Best Estimate								\$1,183	\$935	\$248	

Appendix F

Tables showing the calculations for the yearly and hourly cost for computer equipment are shown below in "Early/Hourly Equipment Costs-Computers." This hourly cost is used to calculate the final computer equipment costs shown in "Final equipment Costs-Computers." Costs are adjusted for inflation based on the value of the 2004 dollar.

Yearly & Hourly Equipment Costs Computers		
Year	Yearly¹ Cost	Hourly² Cost
2001-02	\$8,454	\$0.19
2002-03	\$8,322	\$0.19
2003-04	\$8,141	\$0.18

¹Based on 37 units X \$ 1500 over 7 yrs useful life

²Hourly Cost = Yearly Cost / 1196 hours

Final Equipment Costs-Computers										
Teacher	No. of Units	2001-02			2002-03			2003-04		
		Hourly Cost	Hours Used	Cost	Hourly Cost	Hours Used	Cost	Hourly Cost	Hours Used	Cost
Lab	30	\$5.70	5.6	\$31.92	\$5.70	70	\$399.00	\$5.40	67.2	\$362.88
Eng. 1	1	\$0.19	0	\$0.00	\$0.19	2	\$0.38	\$0.18	2	\$0.36
Eng. 2	1	\$0.19	0	\$0.00	\$0.19	3	\$0.57	\$0.18	2	\$0.36
Eng. 3	1	\$0.19	0	\$0.00	\$0.19	4	\$0.76	\$0.18	3	\$0.54
Eng. 4	1	\$0.19	10	\$1.90	\$0.19	12	\$2.28	\$0.18	4	\$0.72
Eng. 5	1	\$0.19	0	\$0.00	\$0.19	3	\$0.57	\$0.18	3	\$0.54
Eng. 6	1	\$0.19	0	\$0.00	\$0.19	2	\$0.38	\$0.18	2	\$0.36
Admin.	1	\$0.19	3	\$0.57	\$0.19	12	\$2.28	\$0.18	4	\$0.72
Totals				\$34.39			\$406.22			\$366.48

Appendix G

The cost per ream of paper is shown adjusted for inflation. The first table, "Supply Cost-Paper Cost per Ream," shows the cost per ream of paper adjusted to the 2004 dollar. This per ream cost is then used to calculate the final paper cost as shown in "Final Supply Costs-Paper" below. The final table shows the cost for printer cartridges consumed for both student and faculty use. The cost is calculated based on paper usage.

Supply Cost- Paper Cost per Ream		
Year	Cost per Case	Per Ream
2001-02	\$26.00	\$2.60
2002-03	\$27.50	\$2.75
2003-04	\$29.00	\$2.90

Final Supply Costs Paper										
Teacher	No. of Units	2001-02			2002-03			2003-04		
		Per Ream	No. of Reams	Cost	Per Ream	No. of Reams	Cost	Per Ream	No. of Reams	Cost
Eng. 1	1	\$2.60	0	\$0.00	\$2.75	3	\$8.25	\$2.90	2	\$5.80
Eng. 2	1	\$2.60	0	\$0.00	\$2.75	3	\$8.25	\$2.90	2	\$5.80
Eng. 3	1	\$2.60	0	\$0.00	\$2.75	3	\$8.25	\$2.90	3	\$8.70
Eng. 4	1	\$2.60	10	\$26.00	\$2.75	12	\$33.00	\$2.90	4	\$11.60
Eng. 5	1	\$2.60	0	\$0.00	\$2.75	6	\$16.50	\$2.90	6	\$17.40
Eng. 6	1	\$2.60	0	\$0.00	\$2.75	3	\$8.25	\$2.90	3	\$8.70
Admin.	1	\$2.60	1	\$2.60	\$2.75	5	\$13.75	\$2.90	4	\$11.60
Totals				\$28.60			\$96.25			\$69.60

Appendix G (Cont.)

Supply Cost Printer Cartridges			
Year	Quantity	Unit Cost	Total Cost
2001-02	5500	\$0.01	\$58.64
2002-03	17500	\$0.01	\$183.68
2003-04	12000	\$0.01	\$123.21

Appendix H

Other Inputs-Utilities

The cost for utilities, including heat and electric, were based on monthly billing statements. The table below, "Utility Cost Per Hour For each Room," shows these costs average per square foot per hour. This result was then used to calculate a total cost for utilities based on the square footage of each space and the time each space was used. This time estimate came from the teacher's best estimate. The remaining tables show the utility costs for each year of the intervention.

Utility Cost Per Hour For Each Room (Based on cost per sq. ft per hour of 8 cents)			
	2001-02	2002-03	2003-04
Library (2800 sq. ft)	\$1.40	\$1.40	\$1.40
Writing Lab (1500 sq. ft)	\$0.75	\$0.75	\$0.75
Existing Classrooms (925 sq. ft)	\$0.46	\$0.46	\$0.46
New Classrooms (800 sq. ft.)	\$0.40	\$0.40	\$0.40
Office (1200 sq. ft)	\$0.60	\$0.60	\$0.60

2001-02 Utilities Cost									
	Eng. 1	Eng. 2	Eng. 3	Eng. 4	Eng. 5	Eng. 6	Admin.	Tot Cost	
Office- Hourly Room Cost	\$0.60								
Hours Used							72		
Cost Per Year By User							\$43.20	\$43.20	
Existing Classrooms- Hourly Cost	\$0.46								
Hours Used									
Cost Per Year By User									
New Classrooms- Hourly Cost	\$0.40								
Hours Used				48					
Cost Per Year By User				\$19.21				\$19.21	
Writing Lab- Hourly Cost	\$0.75								
Hours Used				5.6					
Cost Per Year By User				\$4.20				\$4.20	
Library- Hourly Cost	\$1.40								
Hours Used				2.8					
Cost Per Year By User				\$3.92				\$3.92	
Cost for All Utilities-Best Estimate								\$71	

Appendix H (Cont.)

2002-03 Utilities Costs								
	Eng. 1	Eng. 2	Eng. 3	Eng. 4	Eng. 5	Eng. 6	Admin.	Tot Cost
Office- Hourly Room Cost	\$0.60							
Hours Used							18.2	
Cost Per Year By User							\$10.92	\$10.92
Existing Classrooms- Hourly Cost	\$0.46							
Hours Used			43.2			48.0		
Cost Per Year By User			\$19.89			\$22.09		\$41.98
New Classrooms- Hourly Cost	\$0.40							
Hours Used	68.7	35.8		82.7	57.8			
Cost Per Year By User	\$27.50	\$14.32		\$33.06	\$23.10			\$97.98
Writing Lab -Hourly Cost	\$0.75							
Hours Used	5.6	16.8	11.2	2.8	22.4	11.2		
Cost Per Year By User	\$4.20	\$12.60	\$8.40	\$2.10	\$16.80	\$8.40		\$52.50
Library- Hourly Cost	\$1.40							
Hours Used	8.4	8.4	8.4	11.0	5.6	5.6		
Cost Per Year By User	\$11.76	\$11.76	\$11.76	\$15.40	\$7.84	\$7.84		\$66.36
Cost for All Utilities-Best Estimate								\$270

2003-04 Utilities Cost								
	Eng. 1	Eng. 2	Eng. 3	Eng. 4	Eng. 5	Eng. 6	Admin.	Tot Cost
Office- Hourly Room Cost	\$0.60							
Hours Used							6.5	
Cost Per Year By User							\$3.90	\$3.90
Existing Classrooms- Hourly Cost	\$0.46							
Hours Used			53.3			61.72		
Cost Per Year User			\$24.52			\$28.39		\$52.91
New Classrooms- Hourly Cost	\$0.40							
Hours Used	73.91	52.94		75.25	76.47			
Cost Per Year User	\$29.56	\$21.18		\$30.10	\$30.59			\$111.43
Writing Lab- Hourly Cost	\$0.75							
Hours Used	5.6	22.4	14	2.8	14	8.4		
Cost Per Year User	\$4.20	\$16.80	\$10.50	\$2.10	\$10.50	\$6.30		\$50.40
Library- Hourly Cost	\$1.40							
Hours Used	5.6	8.4	5.6	11	5.6	5.6		
Cost Per Year User	\$7.84	\$11.76	\$7.84	\$15.40	\$7.84	\$7.84		\$58.52
Cost for All Utilities-Low Estimate								\$277

George E. White

gwhite@mail.clarion-schools.com

Home: 236 Ridgewood Road, Shippenville, PA 16254
(814) 226-5837

Academic Preparation:

The Pennsylvania State University

Letter of Eligibility, College of Education, 2001
Secondary and Elementary Principal Certification, College of Education, 1993
M.A. in Curriculum and Instruction, College of Education, 1982
Masters Paper: *Computer Assisted Instruction in Physics*

Clarion State College, Clarion, Pa. 16214

B.S. in Biology, College of Arts and Sciences, 1976

Professional Experience:

Moshannon Valley School District, Houtzdale, PA 16651

Biology teacher, 1979 to 1983

Clarion Area School District, Clarion, PA 16214

Media Specialist and Computer Instructor, 1983 to 1995
Assistant for Technology and Curriculum Development, 1995 to 1999
High School Principal, 1999-2005
Superintendent, 2005 to present

Professional Presentations:

- * "Scheduling and Curriculum in Secondary Schools", Clarion University, June 2005
- * "Orientation to School Law", Clarion University, October 2004
- * "Orientation to School Law", Slippery Rock University, October 2003.
- * "School Law for Block Students", Clarion University of Pennsylvania, September 2003.
- * "School Law: Practical Advice", Clarion University of Pennsylvania, February 2003.
- * "School Law: Practical Advice", Edinboro University of Pennsylvania, June 2002.
- * "School Communications", Edinboro University of Pennsylvania, April 2002.
- * "Developing Critical Thinking", Clarion Area School District, March 2001
- * "Understanding Concepts", Clarion Area School District, March 2001
- * "Job Interview Strategies", Clarion University of Pennsylvania, May 1999.

Grants Received:

Pennsylvania Academy of Teaching Grant, *"Senior Capstone Project"*. Awarded 1995.
Information Technology Educational Consortium (ITEC) grant. Awarded 1986.