

The International Baccalaureate Middle Years Program:
A Comparison of the Standards of Learning Achievement Levels by Total Group and Ethnicity

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(ABSTRACT)

The purpose of the study was to examine the Standards of Learning (SOL) test results of students participating in an International Baccalaureate Middle Years Program (IBMYP) and compare their achievement with students of similar ability in schools not authorized to offer the Middle Years Program (MYP). It was important to determine if the MYP students, who were learning in a different and more holistic manner, were still competitive with their counterparts on standardized achievement measures.

The study was guided by four questions: (1) To what extent is there a difference between the SOL achievement scores of students in an IBMYP and the SOL achievement scores of students not in an IBMYP?; (2) To what extent is there a difference between the SOL achievement scores for Black students in an IBMYP and the SOL achievement scores of Black students not in an IBMYP?; (3) To what extent is there a difference between the SOL achievement scores for Hispanic students in an IBMYP and the SOL achievement scores of Hispanic students not in an IBMYP?; (4) To what extent is there a difference between the SOL achievement scores for White students in an IBMYP and the SOL achievement scores of White students not in an IBMYP?

The study was organized into intervention and control groups, which were statistically similar. In order to determine if the groups were statistically similar at the onset of the study, baseline data were established. One group of eighth grade students who were participating in the MYP program (intervention) and a non-participating group of eighth grade students (control) were

matched by their Grade 5 VA Standards of Learning (SOL) achievement scores and ethnicity. The SOL data from the spring 2004 test administration were used for the study. Independent *t* tests were conducted to determine to what extent, if any, was there a difference between the SOL achievement scores of students who were participating in the MYP and the SOL achievement of students not participating in the MYP. Additionally, *t* tests were used to measure to what extent was there a difference between the achievement of Black, Hispanic, and White subgroups of the MYP and non-MYP students measured by their SOL scores. The effect size was calculated to determine the strength or magnitude of the differences between the two sets of data.

The findings of the study indicated the average SOL mean scores of the total MYP group were higher than the mean scores of the total non-MYP group in all areas although there were no statistically significant differences ($p < .05$). The results also indicated that no statistically significant difference existed between the average SOL mean scores of Black students who participated in the MYP and Black students who participated in non-MYP schools across the division ($p < .05$). The results further indicated that no statistically significant differences existed between the average SOL mean scores of Hispanic students who participated in the MYP and Hispanic students who participated in non-MYP schools across the division ($p < .05$). Lastly, the results indicated that no statistically significant difference existed between the average SOL mean scores of White students who participated in the MYP and White students who participated in non-MYP schools across the division ($p < .05$).

The content area that showed the greatest difference was English: Reading, Literature, and Research (15 scaled score points). Performance on the History/Social Science and Science SOL tests were virtually identical. For Black and Hispanic IBMYP students, the highest levels of performance were limited to the English: Reading, Literature, and Research test.

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TABLE OF CONTENTS

	Page
Abstract.....	ii
Acknowledgements.....	iv
List of Tables	viii
List of Figures.....	x
Chapter 1 Introduction	1
No Child Left Behind Legislation.....	2
The Problem.....	5
Significance of the Study	9
Theoretical Framework.....	11
Definition of Terms.....	12
Summary of the Dissertation	15
Chapter II Review of Literature.....	18
Historical Perspective	18
Why an International Education?.....	23
An International Baccalaureate Education.....	24
The International Baccalaureate Middle Years Program.....	28
The Middle Years Program at an IBMYP Middle School.....	30
Phase 1	31
Phase 2	31
Phase 3	32
Staff Training and the Middle Years Program.....	40
Intercultural Understanding and the Middle Years Program.....	45
The Curriculum and the Middle Years Program.....	46
Students and the Middle Years Program	47
Parents and the Middle Years Program	50
Administration and the Middle Years Program.....	51
Standardized Achievement Tests.....	53
The Virginia Standards of Learning	54
Chapter III Method and Design of the Study.....	62
Sample.....	65
Variables	71
Data Collection and Analysis.....	72
Chapter IV Results.....	75
Results for Each of the Research Questions	90
Chapter V Findings, Conclusions, Discussion, and Recommendations.....	93
Summary of the Findings.....	93
Research Question 1	95

Research Question 2	95
Research Question 3	95
Research Question 4	95
Conclusions.....	95
Conclusion 1	96
Conclusion 2	96
Discussion.....	97
Recommendations for Future Research.....	101
References.....	103
Appendices	
A: 2004 Standards of Learning English 8.....	117
B: 2004 Standards of Learning Mathematics 8.....	119
C: 2004 Standards of Learning History and Social Science 8.....	122
D: 2004 Standards of Learning Science 8.....	130
Vita.....	133

LIST OF TABLES

	Page
Table 2.1	MYP Training—IB Diploma High School/IBMYP Middle School 2003-200443
Table 3.1	School Program Data63
Table 3.2	Comparison of Student Ethnicity64
Table 3.3	Sample Size Summary All Students: Content Area All Students67
Table 3.4	Sample Size Summary by Ethnicity: A. Content Area White Students68 B. Content Area Black Students69 C. Content Area Hispanic Students70
Table 4.0	Research Question Summary77
Table 4.1	Grade 5 Mean Scale Scores for the Intervention and Control Groups A. English Reading, Writing, and Mathematics79 B. History and Science79
Table 4.2	Grade I SOL t tests for total Group English Reading81
Table 4.3	Grade 8 SOL t tests for Total Group English Writing81
Table 4.4	Grade 8 SOL t tests for Total Group Mathematics81
Table 4.5	Grade 8 SOL t tests for Total Group History82
Table 4.6	Grade 8 SOL t tests for Total Group Science82
Table 4.7	Grade 8 t tests for Total Group Ethnicity English Reading84
Table 4.8	Grade 8 SOL t tests for Total Group Ethnicity English Writing85
Table 4.9	Grade 8 SOL t tests for Total Group Ethnicity Mathematics86

Table 4.10	Grade 8 SOL t tests for Total Group Ethnicity History87
Table 4.11	Grade 8 SOL t tests for Total Group Ethnicity Science.....88

LIST OF FIGURES

	Page
Figure 2.1	2004 Annual Income: International Baccalaureate Organization.....26
Figure 2.2	2004 Annual Expenditures: International Baccalaureate Organization.....26
Figure 2.3	International Baccalaureate Philosophy and Curriculum (IBO).....34
Figure 2.4	What Does It Take to Get the MYP Certificate?39
Figure 2.5	IB Middle Years Program and the LEARN Model49

CHAPTER I

INTRODUCTION

American public education is changing to meet new challenges that demand high expectations and achievement standards. With an eye towards raising the academic achievement of all students throughout the country, states and school districts are making efforts to align curriculum, instruction, assessments, and teacher training with these higher standards. To meet the challenge of supporting and sustaining efforts to improve student achievement, schools are evaluating student progress, making strategic decisions about instructional practices, and aligning all aspects of school operations, from professional development to parent and community involvement (Siddens, 1998).

Why this urgency for accountability from the Executive Branch of the government? Throughout history, legislators have questioned and debated the perceived sub par performance of American students versus their counterparts in other industrialized countries. Legislators have also raised serious concerns regarding minority students' low performance on national, state, and local achievement tests. Since 1965, the federal government has spent billions to help disadvantaged and low socioeconomic children in America's public schools. Yet the achievement gap between White and minority students remains wide. Passed in 2002 by the Bush administration, the *No Child Left Behind* (NCLB, 2000) legislation provides hope for minority students throughout the states. Its widespread support demonstrated that legislators, educators, and parents will take the steps necessary to ensure that all children get the level of education necessary to achieve the American dream (Education Trust, 2003).

No Child Left Behind Legislation

The intended mission of the *No Child Left Behind* (2000) legislation was to increase public school accountability, close the achievement gap between minority students and White students, and improve overall student performance. It proposes to do this in two ways: through implementation of higher standards and increased accountability from the top and through “choice” and flexibility from parents at the bottom. The NCLB regulation raised the stakes in terms of school accountability. Beginning in the school year 2005-2006, NCLB required annual mathematics and reading or language arts testing in grades three through eight and again in high school to provide teachers with current data to help diagnose problems and identify solutions before any student fails to meet the standards of proficiency within his state system. It assesses whether schools are making “adequate yearly progress” (AYP) and provides severe penalties if they fail to do so. Its principal innovation is to hold schools accountable for the success of specific subgroups of students to prevent high average scores from masking serious achievement gaps. By revealing hidden inconsistencies in overall student achievement, school districts are expected to better target their resources on students who need the most help. NCLB also seeks to empower parents with information and options for change if their child’s academic needs are not being met. Parents of children in schools that do not meet state standards for at least two consecutive years may transfer their children to a better performing school, including a public charter school, within the school’s district. The district must provide transportation, using *Title I* (Elementary and Secondary Education Act, 1965) funds, if necessary. Students from low-income families in schools that fail to meet state standards for at least three years are eligible to receive supplemental educational services that include tutoring, after-school services, and summer

school. Because NCLB lays down extensive educational options for all students, many school districts today subscribe to the philosophy that failure is not an option.

Not everyone believes, however, that American schools are failing and require such an extensive reform initiative as NCLB. Berliner and Biddle (1994) asserted in their book, *The Manufactured Crisis*, that the failure of American public schools is an inaccurate assessment. They further state that the contention that the claim that American schools are failing badly by comparison with schools in other industrialized countries is not supported by research-based evidence. When the evidence is analyzed responsibly and careful thought is given to its implications, the book notes that American schools stack up very well with other industrialized countries. Although United States students lag behind when aggregate scores from some comparative studies are examined, the authors state that the reader needs to understand the following.

1. Few of the studies have yet focused on the unique values and strengths of American education.
2. Many study results have been affected by sampling biases and inconsistent methods for gathering data.
3. Many, perhaps most, study results were generated by differences in curricula—in opportunities to learn—in the countries studied.
4. Aggregate results for American schools are misleading because of the huge range of school quality in this country—ranging from marvelous to terrible.
5. The press has managed to ignore most comparative studies in which the United States has done well.

6. The evidence that does exist suggests that American education has important strengths that do not appear in other countries.

Berliner and Biddle (1994) examined the actual evidence bearing on the major claims of attack on American public schools and found most were unsupported. Instead, their evidence suggests that, on average, American schools are not only holding their own but are also improving in modest ways. They did conclude that the American educational system is not flawless. Indeed, achievement levels of American schools vary greatly, and that variation is a product of serious and growing problems in society and of unconscionable differences in the funding of American schools. The authors further concluded that many initiatives created over time to bring about change within American schools have been very costly and have added little value to the system. Berliner and Biddle believe it is possible to create real change in the schools, but it will require adequate research on major decisions made that concern the organization, staffing, curricula, and teaching methods appropriate for America's schools. Only when appropriate research is conducted can the knowledge be produced that will inform taxpayers who are responsible for funding educational initiatives and avoid serious and costly errors. Such research does not come cheaply. It will require competent, highly trained workers, forethought, and planning. It will also take more time than decision makers would like to acknowledge. However, if America is to avoid the wasted dollars and disrupted lives that poor policy decisions in education generate, it must step up its regular investment in education research. Decisions regarding school improvement and reform initiatives should be grounded in on-going research to maintain a standard level of quality. The IBMYP is an example of a program whereby on-going

research needs to be conducted to ensure that the expected outcomes impact student achievement.

The Problem

A large suburban public school district in Virginia is supporting its educational reform efforts and directing increased resources to improve teaching and learning within several middle schools through the implementation of programs such as the International Baccalaureate Middle Years Program (IBMYP), developed by the International Baccalaureate Organization (IBO). The Middle Years Program (MYP) has been implemented for the purpose of school improvement. This district's Instructional Services Department has defined the common need to strengthen the academic reputation and programs at the middle school (Sidden, 1998). The IBO, which designed the MYP, expects the program to have a powerful effect on teacher expectations, attitudes, and skills, as well as serve to raise overall student achievement.

The MYP model, which has been implemented in schools across North America, ranges from magnet programs where students apply and are recommended for enrollment, to programs where all students in the school are embraced by the philosophy. In the suburban Virginia school district, the School Board directed the school in question to implement an all-inclusive MYP, where all students receive the benefits of an IBMYP education. By casting this broad net, the Board hoped to provide an expansive educational foundation to support all students in their attempts to reach the "raised bar" of the Virginia Standards of Learning (SOLs). The district's vision of its public schools states that it will "...provide a gifted-quality education to every child in an instructional setting appropriate for his or her need." This vision is supported by the school district's stated mission, which is "to educate all students to meet high academic standards and to prepare all students to be responsible citizens in the 21st century." The School Board is

“committed to increasing the academic achievement of all students, including the achievement of students with disabilities, and (to) reducing the gap between Black, Hispanic, or economically disadvantaged students and the total system population.” To support the vision and mission of the district, therefore, and to provide an instructional program of academic rigor and challenge, the school district implemented the IBMYP at the middle school in this study. The program provides an opportunity to extend the capacity for learning for students 11- 16 years of age and serves to elevate academic standards for all students, particularly as measured by statewide assessments. Implementation of the MYP at this school was seen as a tool for reform around which to build success. The MYP approach is to move students in developmentally appropriate ways through an entire five-year continuum.

In addition to supporting the school district’s vision and mission, the IBMYP philosophy is also consistent with the district’s strategic plan for school improvement. The strategic plan specifically targets assessment and achievement measures for closing achievement gaps and increasing minority achievement and participation in advanced courses. Particularly, the district’s improvement plan says that the academic performance of Black and Hispanic students enrolled in the IBMYP will increase annually and, over a five-year period, ultimately approach the performance levels of students in the general population. The importance of offering effective school programs, such as the IBMYP, for young adolescents will be discussed in Chapter II; the consequences of failing to do so will also be discussed.

To date, minimal formal research has been conducted to ascertain the IBMYP’s effectiveness in improving student achievement on standardized tests because the IBO does not consider standardized tests as a measure of program success. For reasonable decisions to be made about the effectiveness of school programs such as the IBMYP, however, it is necessary to

provide school leaders and administrators with quantitative achievement data on the students participating in the programs. It should be re-emphasized that the International Baccalaureate Organization itself does not utilize achievement test scores as a measure of success. The organization stresses that its goals for students are more comprehensive than scores on criterion-referenced achievement tests. The IBO offers a criterion-referenced model of assessments. This means that pupils' results are determined by performance against standards, not by each pupil's position in the overall rank order. Its proposed assessment methods are varied and include both summative and formative assessments. MYP teachers are responsible for structuring tasks that allow students to demonstrate achievement according to the required objectives within each subject group. These may include:

1. open-ended, problem-solving activities and investigations
2. organized debates
3. hands-on experimentation
4. analysis
5. reflection

The assessment strategies, both quantitative and qualitative, provide feedback on the thinking processes as well as the finished piece of work. There is also an emphasis on self-assessment and peer-assessment within the program. It is expected that students will be more responsible for their own learning, will know how to learn, will make connections and retain what they learn, be better and more tolerant citizens, and have definite objectives towards further education (IBO, 2005).

While the IBO states that the standardized achievement test is unlikely to be an appropriate instrument for evaluating the qualities emphasized by IBO, there are others who

believe otherwise. Two recent studies of the IBMYP using quantitative achievement data were performed. Both cases indicated that standardized achievement test scores could provide quantifiable data, which can be useful in many ways. One study sought to determine to what extent, if any, one year of IBMYP participation would have on student scores on the CAT/5 achievement test. To perform the study, two groups were formed. One group of sixth-grade students participating in an IBMYP pilot were compared to another group comprised of a matched sample of sixth-grade students not participating in an IBMYP program. Both groups attended the same school and were matched by national percentile scores on the cognitive skill index from fourth-grade achievement tests. Data regarding the variables were collected, and although some scores did not reach the threshold of statistical significance, the fact the IB students' mean scores were higher on all subtests suggested that IBMYP students were achieving at a higher level. The implication is that the IBMYP is a strong academic program for young adolescents (Remington, 2000).

Another study conducted by Academy School District #20 in Colorado Springs, CO, compared IB students to their non-IB counterparts. The results compared were for the 2003 Colorado Student Assessment Program (CSAP) in Grade 3 and 2002 for all other grades. Administered within the state each spring, the CSAP is the assessment used by Colorado to gauge growth for NCLB and AYP. District #20 undertook a longitudinal study beginning in the spring of 2000 to study growth. In all cases, IB-identified students, as a group, outperformed non-IB students on CSAP. In school-within-school programs included in the study, IB students significantly outperformed non-IB counterparts within the same school. These schools' scores reflect one IB Middle Years middle school and one IB Diploma high school (Verda, 2005).

As described earlier, the IBO does not define student success in the MYP in terms of achievement test scores. The purpose for using achievement tests as a part of this study is to meet the expectations of parents, the division, and the state. All Virginia public school students must complete successfully and pass the state SOL achievement tests. The level of attainment on SOLs is the criterion by which all Virginia public schools are measured for accreditation and funding. This study is not looking for predictors of success, but comparing scores from two populations participating in two different middle school programs.

Significance of the Study

As building level administrators work with parents and communities who demand the best instructional practices for their students, it is vital that they be able to answer with some degree of certainty that the IBMYP is one tool that can be used to enhance the learning of all students. Thus, the research will investigate whether students who participate in the IBMYP program do just as well, if not better, than those students who do not participate in the program.

The purpose of the study is to examine Virginia SOL achievement test results from students participating in an IBMYP and to compare their achievement with students of similar ability in schools not authorized to offer a MYP. It is important to determine if the MYP students, who were learning in a different and more holistic manner; who were spending more school time in foreign language; and who were experiencing different approaches to learning, were still competitive with their counterparts on standardized achievement measures.

The study was designed to answer four research questions:

1. To what extent is there a difference between the SOL achievement scores of students in an IBMYP and the SOL achievement scores of students not in an IBMYP?
2. To what extent is there a difference in the SOL achievement scores for Black students in an IBMYP and the SOL achievement scores of Black students not in an IBMYP?
3. To what extent is there a difference in the SOL achievement scores for Hispanic students in an IBMYP and the SOL achievement scores of Hispanic students not in an IBMYP?
4. To what extent is there a difference in the SOL achievement scores for White students in an IBMYP and the SOL achievement scores for White students not in an IBMYP?

Demonstrating academic achievement is important, and achievement testing is an established way for measuring it. Knowledge gained from studying the academic performance of students participating in the IBMYP may provide valuable information to educators about organizational philosophies and methodologies that can improve students' achievement levels on high stakes tests. In addition, knowledge gained from the research would contribute to the IBO, the designer of the IBMYP, and its understanding of the correlation between standardized achievement testing and the MYP. The study will attempt to determine to what extent, if any, one year of participation in the MYP might have on student scores on five SOL end-of-year subtests: Mathematics, English, History and Social Science, Science, and Reading achievement

tests. The rationale for using one year for the study is because at the conclusion of each year, students progress to the next level.

Theoretical Framework

This study compared students receiving educations grounded in two somewhat different approaches to middle level education. The traditional middle school program used in the study is based on, and consistent with, the principles described in the National Middle School Association (NMSA) publication *This We Believe* (National Middle School Association, 1995). On the other hand, the MYP was developed by the International Baccalaureate Organization (IBO, 2005), and it transcends traditional school subjects. It offers a flexible framework, whereby schools may organize subjects and curriculums in many different ways. Schools seeking formal authorization of the MYP must undergo a self-study, consultation with the regional IBO office, submission of written documentation, and an on-site visit by IBO representatives. Schools offering the program must be validated by IBO as to their preparedness to offer the program. Follow-up evaluations occur every five years to assess the effectiveness of the delivery of the MYP at the authorized school; individual teachers or students are not assessed.

This study compared students in traditional middle school programs with students in an IBO school. It should be re-emphasized that the IBO does not utilize or recommend standardized achievement testing as a means of evaluating its programs. According to IBO literature, goals for students are more comprehensive and global than scores on criterion-referenced achievement tests. IBO-recommended assessment methods include both formative and summative assessments. It is expected by the IBO that after participating in the MYP,

students will be more responsible for their own learning, will know how to learn, will make connections and retain what they learn, be better or more tolerant citizens, and have definite objectives towards furthering their education (IBO, 2005).

Definition of Terms

The following definitions apply in this study:

1. *Achievement Test*: Achievement tests measure the current status of individuals with respect to proficiency in a given area of knowledge or skill. They measure knowledge of facts, concepts, and principles. An individual's level of achievement is compared to the norm, or average score, for his grade or age level. This study used the Virginia SOL Tests.
2. *POS*: The Program of Studies governs the study school's curriculum and furnishes information about curriculum within the school district. The POS covers the same curriculum as set by the Commonwealth of Virginia standards, and in many cases, goes beyond the state standards. All Virginia Standards are included in order to prepare students to take the state SOL tests.
3. *Areas of Interaction*: Five themes, known as the Areas of Interaction give the IBMYP its distinctive core: *homo faber* (Man the Maker), environment, health and social education, community service, and approaches to learning (IBO, 2005).

4. *IBO*: The International Baccalaureate Organization (IBO), a nonprofit educational foundation based in Geneva, Switzerland, offers the Diploma Program for students (aged 16 to 19) in the final two years of school, the MYP in the 11 to 16 age range, and the Primary Years Program for students aged 3 to 12 years. The IBO has authorized some 1,742 IB schools in 122 countries to teach these programs. As of 2005, there are 68 authorized Middle Years Programs in the United States. In addition, the organization provides curriculum and assessment development, teacher training and information seminars, electronic networking, and other educational services to these schools (IBO, 2005).

5. *MYP*: The Middle Years Program was developed by the IBO for 11 to 16 year-old students. It is characterized by eight curricular themes: science, language A, language B, humanities, mathematics, arts, physical education, and technology. In addition, it includes five Areas of Interaction which are: approaches to learning, community service, *homo faber*, environment, and health and social education. These areas are embedded in the curricula of each subject (IBO, 2005).

6. *Middle School Philosophy*: The approach embraced by middle level educators is that using age-appropriate curriculum and providing effective opportunities are the most effective ways to educate young adolescents. This philosophy is characterized by: a curriculum that is challenging, integrative, and exploratory; varied teaching and learning approaches; assessment and evaluation that promote learning; flexible organizational structures; programs and policies that foster

health, wellness and safety; and a comprehensive guidance program. (NMSA, 1995).

7. *NMSA*: The National Middle School Association is an association dedicated to improving the educational experience of young adolescents by providing vision, knowledge, and resources to all who serve them in order to develop healthy, productive, and ethical citizens (NMSA, 1995).

8. *SOL*: The Standards of Learning for Virginia Public Schools describe the Commonwealth's expectations for student learning and achievement in grades K-12 in English, Mathematics, Science, History and Social Sciences, Technology, the Fine Arts, Foreign Language, Health and Physical Education, and Driver Education. These standards represent a broad consensus of what parents, classroom teachers, school administrators, academics, and business community leaders believe schools should teach and students should learn. In the four core areas of English/Reading, Mathematics, Science, and History and Social Science, a curriculum framework is also provided that details the specific knowledge and skills students must possess to meet the standards for these subjects (Virginia Department of Education, 2005).

9. *Model Campus Initiative*: The Model Campus includes both the IBMYP middle school and IB Diploma high school (DP). It provides a place where learning involves the pursuit of intellectual knowledge and is viewed as a priority and a

right for all students. The Model Campus takes advantage of social, cultural, and economic diversity to ensure academic excellence, intellectual curiosity, and social responsibility of students in grades 7 – 12. Both the middle and high school place a strong emphasis on the ideals of international understanding and responsibility through the MYP and DP programs. The programs promote global citizenship, inter-cultural awareness, rigorous academics, higher thinking skills, and life-long learning. With the support of the study school district's Cluster Assistant Superintendent's Office, staff members, students, parents, and the community, the Model Campus builds on achievement in academics, the arts, and co-curricular activities to prepare students for success. To achieve this mission, students will improve achievement in English, Mathematics, Science, Reading, and Social Studies (Fairfax County Public Schools, 1998).

Summary of the Dissertation

This study attempts to examine the Commonwealth of Virginia's SOL test results from students participating in an IBMYP school and compare student achievement with students of similar ability in schools not authorized to offer the MYP. Specifically, the study will initially compare the achievement levels of the total group, and then, subgroups of White, Black, and Hispanic students. This study does not compare subgroups to each other, only MYP students in various subgroups to non-MYP students. The organization of the study structure will include the following:

Chapter I includes a description of the IBMYP as a program approved by a large suburban school division in Virginia to improve the achievement levels of students, a statement of the problem and its context, the significance of the study, the theoretical framework, a definition of terms, and a summary of the dissertation.

Chapter II presents a review of literature relative to the IBMYP's philosophy and framework as a tool for school reform and increased academic achievement on state end-of-year achievement tests. This chapter begins with an overview on what research reveals as effective techniques for helping young adolescents meet high academic standards. Subsequently, there is a descriptive analysis of a school district's implementation process for the MYP, factors that prompted the school district to consider its adoption, and changes that occurred in the learning environment relative to school operations. The review also identifies and describes the MYP theoretical framework and is followed by responses that influence implementation and achievement.

Chapter III includes a discussion of the methodology utilized in the study. The study consists of a comparative research design. Included in this chapter are the purpose of the study, research procedures, intervention and control group selection, research questions, variables, and data collection and analysis used to determine research findings and conclusions.

Chapter IV presents the results obtained through the data analysis. This chapter contains a descriptive and narrative summary of the data for each of the four proposed research questions. Spring 2004 SOL scores were utilized to determine the mean scores for the five variables: Mathematics, English, History/Social Science, Science, and Reading. A *t* test was performed on both intervention and control group means to determine what statistical difference, if any, exists

after participation in the MYP. Additionally, the effect size was calculated to determine the strength or magnitude of the difference between the two sets of data.

Chapter V presents a summary of the findings, conclusions, discussion, and suggested areas for further research. The chapter presents findings and conclusions drawn from the study. It includes a discussion of the instructional conditions and IBMYP programmatic interventions proven useful in addressing the achievement levels of students on SOL standardized achievement tests. Finally, this chapter will offer recommendations for future research.

CHAPTER II

REVIEW OF LITERATURE

The focus of the literature review includes information on what research reveals as effective techniques and/or programs for helping young adolescents meet high academic standards. Its primary focus is to share the latest research and knowledge regarding how student achievement has been and is measured and examined. The chapter includes a review of standardized assessment data and results relative to a specific program initiative identified to promote increased achievement.

In order to consider the significance of this research and its relationship to middle level education, it is helpful to structure the context of the information by historical perspective: the benefits of an international education; the MYP principles, intercultural understanding, curriculum, and student and parent responses; staff training and assessment; MYP implementation at one middle school; utilization of standardized achievement tests to compare students' growth on state end-of-year standardized tests, and the Virginia SOL achievement tests. This literature review will also examine the purpose, strengths, and limitations of using standardized achievement test data as an instrument to measure intellectual growth when evaluating the success of a specific program initiative.

Historical Perspective

During the early 20th century, American public schools' major purpose was to teach elite groups of children. Assessment measures were classroom-based and used to provide feedback to students, parents, and teachers about student progress in meeting teacher goals (Asp, 2000). Existing external assessments determined which students attended the limited number of centers

for higher education in operation (U.S. Office of Technology Assessment, 1992). As educational accessibility for all Americans and tax dollars paid for education increased, however, the need to know what schools were doing and what students were learning grew quickly.

The mid-1970s sparked ongoing interest in reforming public education because of the widespread perception that student test scores and the quality of public schooling were declining. This was motivated in part by a decline in Scholastic Aptitude Test (SAT) scores. Prior to this period, the most extensive public discussion of education reform was occasioned by the Sputnik launch in 1957 (Dee, 2002). Dee, Popham (1981) and other critics of that period emphasized that a high school diploma, once a significant and hard-earned personal accomplishment, had been debased through the abuses of social promotion and the tolerance of low academic standards.

The earliest manifestation of reform was the adoption of a test-based performance standard, the Minimum Competency Test (MCT). Beginning in 1975, nearly every state introduced new MCT programs designed to assess students' basic skills (Pipho, 1978). Most of the programs were established to identify low-performing students and direct them to sources of remediation. Several of these states also mandated, however, that students pass a MCT in order to graduate with a standard diploma (Dee, 2002). By 1992, the graduating high school seniors in fifteen states had to pass an MCT (Jacob, 2001). Students initially sat for these exams in the ninth or tenth grades and had multiple opportunities for retests. The MCT standards typically required that students demonstrate basic math and reading skills at only an eighth or ninth grade level (Dee, 2002). In response to failure rates on initial tests that were deemed politically unacceptable, these standards were sometimes lowered (Catterall, 1989). Consequently, the ultimate pass rates among high school seniors were extremely high (Serow, 1984).

According to Haycock and Ames (2000) students completing middle-grade educations today know somewhat more in core academic subject areas than their predecessors did in the 70s. They noted that by the end of the 90s, however, that less than 40 % of all students reached the proficient level in any academic subject. Moreover, patterns of achievement differed across subjects, as well as among students of different racial and economic backgrounds. Middle-grade students made cumulative advances in mathematics through all the decades. Although they made gains in reading during the 70s, their scores remained stable during the 80s and 90s. Their performance in science was inconsistent over time, down in the 70s, up in the 80s, and then down again in the 90s. When the data were disaggregated by race, the authors noted that the pattern was clear: while the achievement gap between Whites and minority students narrowed in the 70s and early 80s, it widened again in the 90s (Haycock, 2000).

At the Third International Conference on Mathematics and Science, Haycock and Ames (2000) presented data showing that international comparisons on math and science were equally discouraging. American students, when compared to students in other countries, did relatively well in reading and mathematics at fourth grade. In fact, they were near the top in science and in the upper middle tier in mathematics. By eighth grade, however, their relative position had fallen rather dramatically. While American students' performance showed improvement in grades five through eight, student improvement in other countries was considerably more.

Using data from a variety of sources, Haycock and Ames (2000) described the factors that appear to be associated with higher student achievement; these include rigorous curriculum, challenging lessons and assignments, well-educated teachers, and adequate instructional resources. Where students are most likely to have the aforementioned opportunities, the higher achievement is consistent across all subjects and grades. Poor students, minority students, and

lower-achieving students of all races were far more likely than other students to receive a watered-down curriculum, less qualified teachers, and inadequate resources. Haycock and Ames also concluded that despite the fact that middle-grade students were exiting eighth grade with somewhat higher skills, many were trapped without the skills necessary for high school success and performed well below their counterparts in other nations. Their findings highlighted that the problem was exacerbated for students from families living in poverty, students of color, students with disabilities, and other students traditionally overlooked in our nation's schools. Unless Americans work hard to improve middle-level education, especially for those who are most at risk of educational failure, they will be limiting the future life and career options of another generation of young people.

Brennan, Kim, Wenz-Gross, and Siperstein (2001) stated that the passage of *Goals 2000* and the reauthorization of *Title I* (1994) empowered many states to re-engage in an ambitious series of reforms to upgrade curriculum, instruction, and assessment. Federal policies encouraged the establishment of more challenging content standards and the alignment of assessments with these standards; they also supported holding schools responsible for helping all children master the rigorous body of academic knowledge and skills (Cohen, 1996; O'Day and Smith, 1993; Ravitch, 1995). Policymakers rely on student performance on large-scale state assessments and high-stakes tests to monitor and evaluate each school's progress in meeting achievement targets (Chudowsky, Gayler, & Hamilton, 2002). The test results mean either rewards or sanctions for each school. In principle, test-based accountability policies create incentives for schools to improve teaching and learning (Elmore, Abelman, and Fuhrman, 1996; Vinovskis, 1996).

Frederiksen (1994) addressed the issue of high-stakes testing more directly. He compared the performance of students who participated in the 1978 National Assessment of Educational

Progress (NAEP) mathematics exam with those who participated in the 1986 exam. He found that nine-year-olds in states with MCTs showed considerably more improvement from 1978 to 1986 than similar students in low or moderate stakes states. He found similar patterns for 13- and 17-year-olds although the effects appear to drop off with the age of students.

Brennan, Kim Wenz-Gross and Siperstein (2001) performed a study to answer the question of whether high stakes testing programs worsen educational outcomes for racial/ethnic minorities and for girls of all races and ethnicities. The results of their analysis revealed that the equitability effects of the Massachusetts Comprehensive Assessment System (MCAS) varied across three academic subjects (Mathematics, English, and Science) and according to the student characteristics. The results suggest that exclusive reliance on standardized test scores to make high-stakes decisions may worsen educational outcomes for minorities. Standardized test scores, by definition, supply the public with a common yardstick for measuring student achievement across a diversity of educational settings. The researchers believe relying exclusively or heavily on high-stakes tests, such as the MCAS, to make critical academic decisions, such as granting a high school diploma, might dramatically set back girls and students of color. During the development and implementation of high-stakes tests, much consideration should be given to the question of how various groups may be affected by choices made regarding various assessment designs.

The Instructional Services Department of the suburban public school system selected for this study included in a report to its School Board that research on middle-grade reform efforts revealed that high-performing schools focused on academic rigor, aligning the curriculum, classroom practices, improving academic performance through better health and fitness, professional development for teachers and principals, connecting schools with communities, and

setting high academic standards for all students. High-performing middle schools also built a sense of teamwork among staff, worked in partnership with parents and the community, and used performance data in decision-making (Sidden, 2003).

Why an International Education?

In the United States, many school divisions are using global education programs to reform school curriculums and to develop the expertise of its teachers. In school systems where traditional approaches to education are firmly established and resistance to improving educational quality is great, offering a global education to improve the quality of school learning and teaching can play a key role in school reform (Hasan, 2000), as was demonstrated in Jordan where the improvement of the quality of school learning had been a concern for two decades. Hasan found that the most important procedure in this approach is designing learning activities that meet two major criteria:

1. Strong relatedness to the school curriculum and content.
2. High relevance to the global education concepts of continual reflection, dialogue, monitoring, and teacher development.

The first criterion assures teachers, principals, and administrators that learning activities will connect to a set curriculum. Teachers are not involved in changing and/or deleting any content.

The second criterion assures that learning activities are an innovative pedagogy, a way of teaching the content that fully engages students in learning, gives “context” and meaning to what they learn, and facilitates their intellectual, social, and emotional development (Hasan, 2000).

In accordance with the two criteria, subject matter should not be presented as ideas or skills to be directly learned, but rather as authentic learning tasks that engage students and invite them

to develop their understanding of the material being taught. To be authentic, learning tasks have to be of concern to students, have to motivate them to conjure up relevant personal experiences (Portes, 1996), and have to put them in life-like situations. The activities are designed to recognize and respect students' diversity and move students into higher levels of learning and development. As students engage in the activities, they shift from a passive to an active mode, where they generate knowledge using their own experiences, intelligences, and communication skills. Marzano, Pickering, and McTighe (1993) believe that authentic assessments or tasks "convey the idea that assessments should engage students in applying knowledge and skills in the same way they are used in the 'real world' outside of school." Teachers using authentic learning activities are driven to rethink their teaching roles and the beliefs, conceptions, and theories in use that support the activities. Their roles shift from transmitting information to facilitating students' inquiry and knowledge construction (Hasan 2000).

The impact of a global education on curriculum reform and teacher development in Jordan concludes that curriculum reform should take place at the operational level where reforms are shaped by actual practice. Reforming a school's curriculum and instructional practices at the formal or institutional level are not adequate. Additionally, reform is an iterative process that involves continual reflection, dialogue, monitoring, and teacher training. Changing teachers' beliefs and developing their skills can be realized through providing opportunities where teachers can truly experience the reforms (Hasan, 2000).

An International Baccalaureate Education

The IBO is a private non-profit educational foundation. It offers the Diploma Program for students in the final two years of secondary school, the MYP for students in the 11 to 16 age

range, and the Primary Years Program for children aged three to twelve. There are currently 1,742 authorized IB authorized schools, both public and private, in more than 122 countries (IBO, 2005). A Swiss foundation headquartered in Geneva, IBO's mission is to develop inquiring, knowledgeable, and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. To this end, the IBO works with schools, governments, and international organizations to prepare challenging programs of international education and rigorous assessments. These programs are designed to encourage students across the world to become active, compassionate, and lifelong learners who understand that other people, with their differences, can also be right (IBO, 2000).

The IBO has a staff of over 300 people and works with over 6,000 examiners worldwide. The organization is expanding rapidly, and its 2004 budget was \$47,901,000. Since the organization has an international status, many parents have been concerned about how the organization is funded and how the monies are used. A review of the IBO's 2004 Annual Review (IBO, 2005) revealed that the largest portion of their income comes from school fees, and the largest portion of their expenditures is for salaries (see Figures 2.1 and 2.2).

The school system under study set a budget of \$330, 537.59 for fiscal year 2004, which represented the estimated costs for each of the three middle schools approved to implement the MYP program within the school district. The funds were spent primarily on professional development, hourly teacher support, supplies, equipment, accreditation, and printing (Hinson, 2005).

Figure 2.1

2004 Annual Income: International Baccalaureate Organization

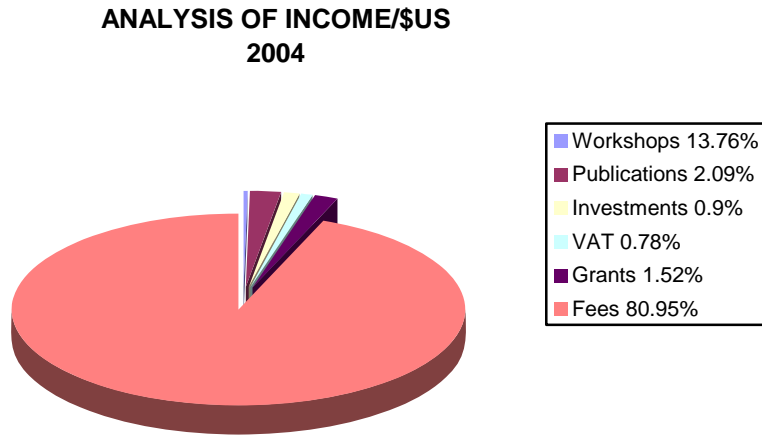
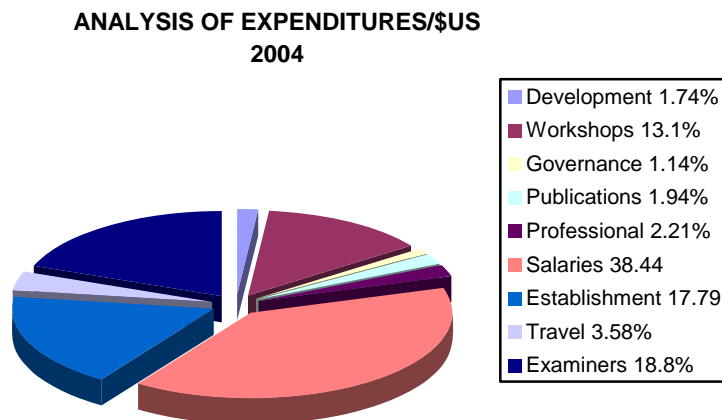


Figure 2.2

2004 Annual Expenditures: International Baccalaureate Organization



The IBO's core activities are curriculum and assessment development and administration, teacher professional development, consultancy and research. Internationally, there are 1,742 public, private, and international schools authorized to offer IB programs in 122 countries (IBO, 2005). Of those schools, 314 schools offer the MYP, and 1,253 offer the International Baccalaureate Diploma Program (DP). Worldwide, 55% of IB students attend state schools (IBO, 2005). Upon completion of the MYP, students may opt to continue along the IB continuum and participate in the DP program (IBO, 2005). Within the IBO continuum of program offerings, the DP is a rigorous pre-university course of studies leading to the IB examination that meets the needs of highly motivated secondary school students between the ages of 16 and 19 years. Designed as a comprehensive two-year curriculum that allows its graduates to fulfill requirements of various national education systems, the diploma model is based on the pattern of no single country but incorporates the best elements of several. The program is available in English, French and Spanish (IBO, 2005). The DP has earned a reputation for rigorous assessment, giving IB diploma holders access to the world's leading universities. The DP's grading system is criterion-referenced; each student's performance is measured against well-defined levels of achievement. These levels are consistent from one examination session to the next and are applied equally to all schools. The DP generally allows students to fulfill the requirements of their national or state education systems and incorporates the best elements of national systems, without being based on any one (IBO, 2005). Internationally mobile students are therefore able to transfer from one DP school to another. The DP program provides a common curriculum and university entry credential for students moving from one country to another, and students who remain closer to home benefit from a highly respected international curriculum (IBO, 2005).

International educators associated with the IBO were motivated not only by practical considerations but also by an idealistic vision. They believed that students should share an academic experience that would emphasize critical thinking, intercultural understanding, and exposure to a variety of points of view (IBO, 2005). The culture of the IBO is strongly motivated by its idealistic mission to create a better world through education. It is an exceedingly professional organization with high standards of education, a deep appreciation of various cultures and languages, and a highly collaborative approach to work and problem solving. Staff members are expected to learn constantly, be flexible and cooperative, and to demonstrate a commitment to multicultural and international understanding.

The International Baccalaureate Middle Years Program

The MYP was introduced to a large suburban school district's school community in 1997 in response to demands for a gifted education for all segments of the school community. One of three programs offered by the IBO, the MYP involves a traditional educational curriculum for grades six through ten that concentrates on the interdisciplinary relationships between eight subjects. The program provides a framework of academic challenge and life skills appropriate to this stage of adolescence and strives to create well-rounded individuals by applying knowledge gained in the classroom to other aspects of the students' lives (IBO, 2005). A MYP partnership generally includes one high school and one or more feeder middle schools. Where local educational structures do not allow for the five-year program, a four-year program may be offered over a shorter period, provided that the program occurs immediately prior to the DP and is taught over at least two consecutive years. The IBMYP middle school in the study requested an exception to offer a four-year program, with two grades, seven and eight, being taught at the

middle school, and the final two years, nine and ten being taught prior to the DP at the high school (IBO, 2005). In the fall of 1998, the School Board gave its approval to begin exploration of the MYP in grades seven to ten beginning with the 1999-2000 school year.

According to IBO literature, the MYP offers an educational approach intended to embrace and yet transcend traditional school subjects. The MYP accentuates the interrelatedness of subjects, thus advancing a holistic view of knowledge. Students are encouraged to develop awareness as well as a genuine understanding of their own history and traditions. It places importance on achieving a firm command of one's own language and the acquisition of a foreign language for effective conversation. The MYP also aims to develop an awareness of the media and competence in information technology (IBO, 2005). The student's intellectual and social development is another MYP focus. Five themes, known as the Areas of Interaction, provide the curriculum model for the program. These are not academic subjects but common themes embedded within and visible across the specific disciplines. The five Areas are *homo faber* (Man the Maker); approaches to learning, which concentrates on developing effective study skills; community service; health and social education; and environment (IBO, 2005).

The MYP is similar to the National Middle School Association (NMSA) curriculum in many ways. The IBO states that it believes that this period of early puberty and mid-adolescence are a critical phase of personal development. Such a time of uncertainty, sensitivity, susceptibility, resistance, and questioning requires an educational program that will provide discipline, challenging standards, skills, creativity, flexibility, and growth toward self-reliance (IBO, 1988). This view of adolescence has also been embraced by the NMSA (NMSA, 1982).

The MYP educational philosophy stresses a curriculum model that embraces the importance of a holistic view of knowledge, intercultural awareness, and communication as

fundamental to the development of the “whole person.” Similarly, the NMSA proposes a model that includes programs for the social, emotional, and intellectual development of the adolescent (IBO, 2005). Both the IBO and the NMSA recommend the use of a variety of assessment strategies and believe that assessment should be an integral part of the learning process.

The Middle Years Program at the IBMYP Middle School

The IBMYP middle school in this study is the feeder school for the local IB high school, which offers the DP. Both programs were developed by the IBO; the DP is designed for junior and senior high school students. The high school also offers “pre”-IB courses developed by the district for students in the ninth and tenth grades. Integration of the suburban MYP middle school described in this study into the international community of IB schools offered advantages to the schools within the community as well as to other district schools currently implementing the MYP and DP. The IBMYP middle school serves a uniquely planned American community and provides a balance of rigorous academics and community services that promote higher learning for all students.

Schools wishing to offer the MYP to its students must be officially authorized by the IBO. Authorization is granted to schools that successfully complete the application process requiring them to present plans and evidence that they are prepared to offer the program. The IBO reviews the proposed MYP school by school and authorizes each based on its assessment of whether that program can meet the standards of the IBO. IBO does not mandate course titles, course sequence, or specific instructional methodologies. According to the IBO literature, the process follows three phases (IBO, 2005):

Phase 1

1. Work with the Regional Office and continue through information gathering and planning activities. School officials work with teachers, school board, district leadership, parents, and students for support (consideration and feasibility study).
2. Order publications such as the subject guides, Coordinator's Handbook, teacher support materials, Implementation and Development Handbook, and Areas of Interaction guides.
3. Identify a potential MYP coordinator.
4. Set up initial meeting with feeder high school.
5. Send core team (English, Social Studies, Science and Mathematics) to Level 1 workshop.
6. Develop a three-year plan for the introduction and implementation of the MYP that includes: (a) a plan to write curriculum which integrates the areas of interaction, (b) implementation schedule, (c) a plan for articulation and coordination between the middle and high school, (d) a schedule of common planning for teachers, (e) release time for the coordinator, and (f) a plan for incorporating the MYP curriculum model.

Phase 2

1. Schools are applicant schools during this phase. Applicant schools must implement the program for at least one full year, though it could extend to two years. During this phase, the school should develop curriculum documents and begin to assemble the MYP Application Form, which will be submitted to IBNA at the end of this phase.

2. Schools must implement the program in at least one grade level. At the MYP school in this study, the program was implemented at the seventh-grade level.
3. Vertical subject teams must be established to work together to develop course outlines.
4. At least one teacher from each of the eight subject areas must attend a level two workshop.
5. All eight MYP subjects must be taught in the level being implemented, and plans for the other MYP levels should be developed.
6. The school puts in place all the processes and resources needed to deliver the program.

Phase 3

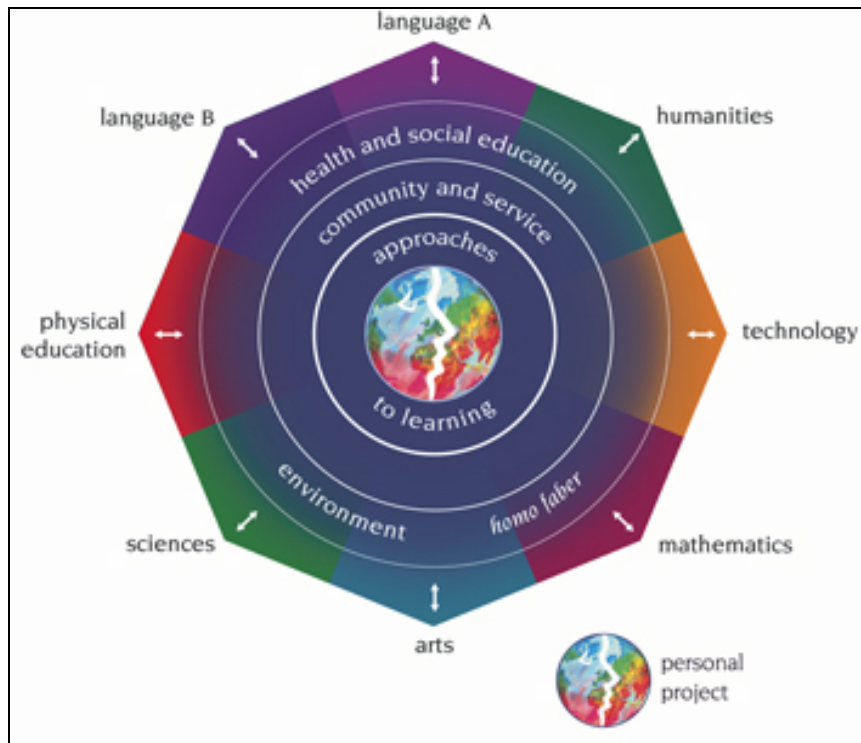
1. At the end of the trial period, a delegation appointed by the IBO visits the school and evaluates the school's capacity to deliver the program. If the outcome is positive, the school becomes authorized to offer the program.
2. The school's delivery of the program is evaluated by the IBO four years after authorization and then every five years.

The four-year MYP curriculum includes implementation of an interdisciplinary approach, promotion of a holistic view of knowledge, and development of intercultural awareness. The MYP emphasizes five Areas of Interaction, or common themes, addressed through eight academic subjects studied over the five years of the program (sixth to tenth grade) and includes Language A (school's language), Language B (modern foreign language), Humanities, Sciences,

Mathematics, Arts, Physical Education, and Technology. In the fourth and final year of the program (tenth grade), students may compile a portfolio of achievement, complete a personal project, and register for an MYP certificate to certify their individual performance in the program (see Figure 2.3).

Figure 2.3

International Baccalaureate Philosophy and Curriculum (Copyright © IBO, 2002)



The school division engaged in an exploration of MYP in 1999-2000 to allow the school community and staff to study the program for its feasibility and appropriateness, as well as to engage in training and staff development. Thus, the 2000-2001 school year was considered the first year of implementation when all seventh- and eighth-graders participated in the program. The goal of the MYP as implemented in the district was to provide a framework of academic challenge and life skills appropriate to students in grades seven through ten, to promote communication and vertical articulation within a pyramid of schools from elementary to middle

to high school, and to prepare students for the IB Diploma and other advanced programs. Beyond these purposes, the school division's instructional services department set several goals for the MYP. The major goals were to ensure effective and efficient implementation of MYP components, to increase student academic achievement at the middle and high school levels, and to increase the number of 11th and 12th graders enrolled in the IB Diploma courses at the high school level (Siddens, 2002).

The IBMYP middle school in this study is one of five middle schools authorized to offer the MYP in a large suburban school district of 27 middle schools. The IBMYP middle school serves as the primary middle school for this suburban community, where, as in many Virginia communities, education is among the highest priorities. The community is comprised of many well-educated and highly mobile families. To serve this population of students, the IBMYP school takes as its primary responsibility the important task of ensuring that only the highest possible educational challenges are provided to all of its students. The IBMYP middle school and IB high school together seek to improve their approaches to education continually.

The MYP curriculum promotes an integrated approach to the academic needs of the diverse student population. The rigor of its standards is shared with its upper-grade complement, the DP, currently implemented at the high school fed by this study's middle school. The high school's DP was authorized in 2000 and has maintained goals consistent with the IBO. The MYP stresses the development of critical thinking capacity across academic disciplines through a unified approach. Although it was believed that the schools encouraged and promoted these ideals prior to the introduction of the MYP, it was maintained that the MYP provided a more solid and flexible structure around which these techniques could be fully explored (IBO, 2005).

The IBMYP middle school's Program of Studies (POS) for grades seven and eight meshed readily with the MYP subject guides. The POS and SOLs are supported by MYP subject guides and the Areas of Interaction; the MYP provides additional focus and context for teaching what is identified as required. It was determined that the incorporation of the interdisciplinary approaches to learning and the Areas of Interaction should favorably affect students' ability to attain SOL requirements by reinforcing learning through connections and relevant real life meaning. Ninth and tenth-grade curricula were already intense; however, incorporation of the interdisciplinary approaches to learning and the areas of interaction were overlays that could easily be applied and were likely to provide additional benefits to students, whether they intended to conclude their IB association at tenth grade or continue towards achieving the DP.

The international and intercultural nature of the MYP made it highly recommended for several reasons. In addition to meshing with the district curriculum, the MYP correlates with the school district's commitment to offer a curriculum of the highest intellectual rigor, one that emphasizes critical thinking and that remains fully informed of its global context. Schools or communities with changing demographic portraits cannot afford to ignore the rapidly changing needs of the diverse student population, which is becoming the norm across the Northern Virginia region where the study school is located. Ignorance of these changes did not merely restrict access to different values and different experiences but seriously undercut the school's capacity to integrate fully all students in the challenging world that the changes represented. It was the school's responsibility to provide a curriculum that drew much of its strength from a broader view of the world and the potential role in that world for students from the IBMYP middle school and IB high school. For these reasons, the MYP appeared to be a strong and ideal match for the needs within the school and community. During the 2003 – 2004 school year,

minority students comprised 54.4% of the IBMYP school population. Student ethnicities at IBMYP middle school include Caucasian, African American, Hispanic, Native American, Asian Pacific, Multi-racial, and Undesignated (FCPS, 2005).

The IBMYP offers a distinct academic environment for students enrolled at the MYP middle school in this study and in the ninth and tenth grades at the DP high school. The four-year program structures each student's academic experience through specific courses, an instructional methodology focused on thematic learning, vertically articulated assessments, a strong commitment to community service, and a personal project in the final 10th grade year. Culminating MYP Certificates record students' accomplishments when they have participated successfully in the entire program (IBO, 2005).

In the MYP school under study, all students are required to participate in eight core subjects each year of the program: English, Foreign Language, Science, Mathematics, Social Studies, Physical Education, Fine and Performing Arts, and Technology, which is embedded in the other seven courses. The MYP prepares students for the highest levels of challenge available in the 11th and 12th grades. A majority of students are expected to leave the eighth grade with two high school credits (Algebra I and Level I of a second language—French, Spanish, or German.) In some cases, two years of foreign language credit may be awarded.

MYP teachers use research-based instructional methodologies—essential questions, formative and summative assessments, interdisciplinary and transdisciplinary activities, thematic units around the five Areas of Interaction, consistent reflection, and a vertically articulated curriculum. Strong connections exist between all levels of the program, and rigor and continuity are stressed throughout the four years. The purported intent of the MYP is to emphasize student reflection about their learning, thus improving their learning across the subject areas (IBO,

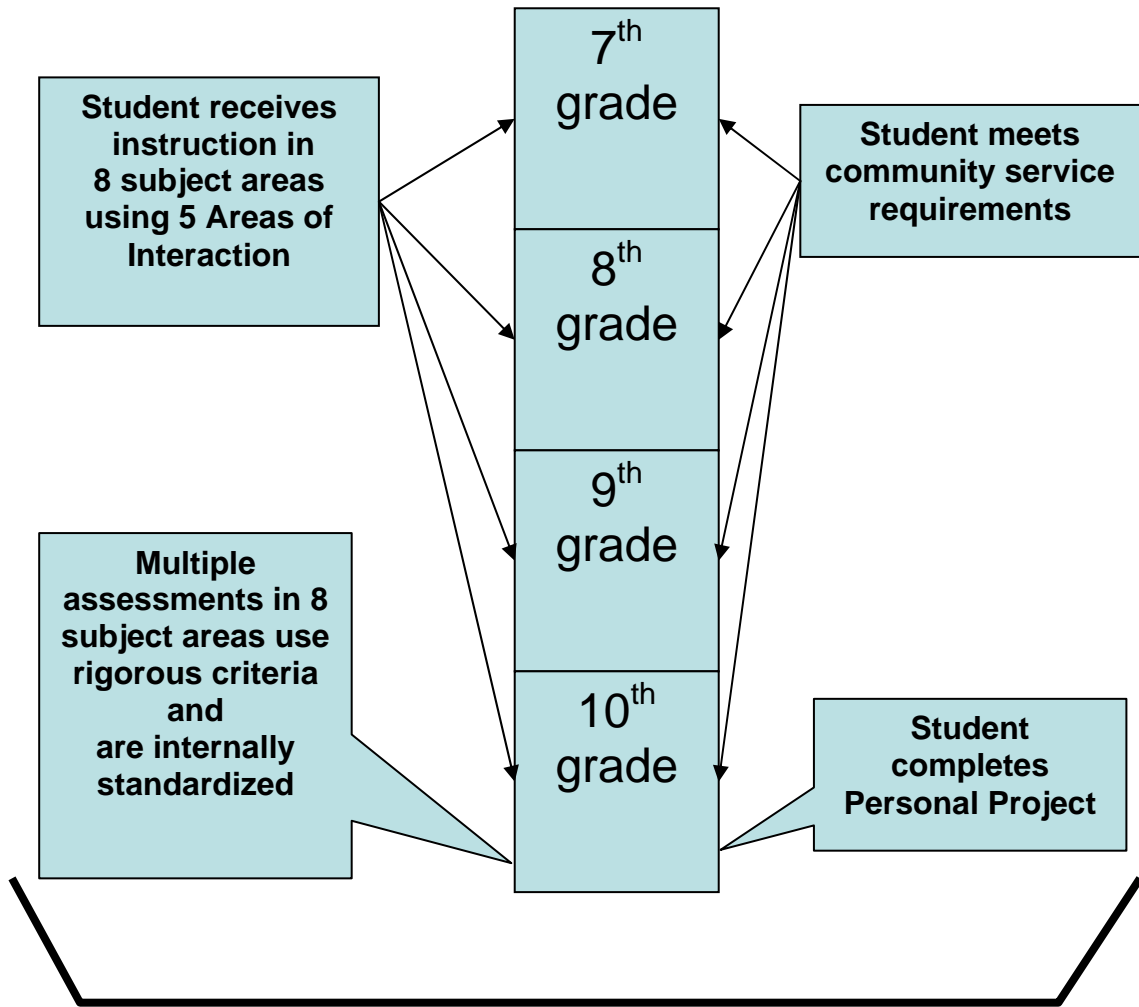
2005). Every year, students participate in grade and subject level tasks that are assessed using MYP rubrics; tasks are scored and retained in the student portfolio. These tasks prepare the student for the rigor of the final-year assessments, which help determine whether students receive the MYP Certificate. Tasks are articulated throughout all four years, each building on the previous year and emphasizing the continuity and constructive nature of learning. All students are also expected to perform 25 hours of community service per year, with the goal the creation within the students of a sense of responsibility to their peers, their families, their school, and their community. Student reflection accompanies all records of service and is retained as part of the student's portfolio (IBO, 2005).

Starting in ninth grade and culminating in the winter of tenth grade, students complete a Personal Project, a large-scale activity of their own design and based on their own interests. With guidance from adults within the school community, students identify a particular area of interest and strength that they are motivated to pursue. The projects are assessed and form a key part of student receipt of the MYP Certificate. In the eighth grade, students complete a mini-Personal Project intended to spark their interest in the final Personal Project. Both activities culminate in a Personal Project Fair. Achievement of the MYP certificate is discussed with students throughout grades seven through ten (see Figure 2.4).

Figure 2.4

What Does It Take to Get the MYP Certificate?

What Does It Take to Get the MYP Certificate?



Completion of all requirements and success on subject assessments (36 of 63 possible points) and Personal Project lead to awarding of MYP Certificate at the conclusion of 10th grade.

Staff Training and the Middle Years Program

The success of the MYP is driven by teacher implementation; therefore, the program requires the professional development of the faculty and staff and leadership development of the administration. One MYP goal is to promote academic achievement through professional development of the staff on the philosophies and methodologies of MYP and to provide students with a seamless curriculum from grades seven through ten that is fostered by vertical articulation between and among staff from both the IBMYP middle school and IB high school (IBO, 2005). Teachers receive training before and after a school become authorized to teach the program. Before a school becomes authorized to teach the program, the teachers involved are required to undergo training; either by attending an IB teacher-training workshop or by participating in school-based training organized by the IBO. By February 1999 at the study school, administrators and a core team of teachers had received training from the regional IBO offices. By the start of the 2000-2001 school year, the entire staff had participated in training in the MYP philosophy and Areas of Interaction and was ready to implement MYP principles. Staff training was accomplished through a variety of components and at a variety of levels. Local MYP coordinators and other local or IB school staff planned and implemented initial MYP training for the staff. Authorized training occurs at three levels (IBO, 2005):

1. International Baccalaureate North America training is the highest quality of training available and is presented around the country in various venues. It is usually subject-specific. Subject guides are distributed and examined during the training.
2. On-site training, or turnaround training, is conducted at the local school by school staff and/or a coordinator. Subjects include basic MYP training, new teacher training, design cycle, development of essential questions, areas of interaction, assessment,

- vertical articulation, as well as regular updates. Teachers also reviewed the 50-hour technology requirement and the district's determination to integrate the subjects through the curricula of all classes. The MYP coordinators at the IBMYP middle school and the IB Diploma high school implemented additional training sessions for experienced and novice teachers at both schools. The sessions introduced the need for using the Areas of Interaction as a lens through which to teach, as well as the use of essential questions that encompass an entire unit or lesson. The MYP coordinator and MYP liaison trained teachers in the necessity of using MYP content assessment and the use of rubrics in grades seven through ten. Teachers looked at sample papers and practiced assessment strategies using MYP guidelines. Teachers submitted to the coordinators samples of the rubrics and individual lessons or units to create a resource bank of information for updates on the status of the MYP. Curriculum information is discussed at monthly staff and leadership meetings. Areas of Interaction leaders meet regularly with the MYP coordinator to plan and implement the MYP. The coordinator meets with interdisciplinary teams to discuss MYP projects and areas of interaction and observes in classrooms to suggest ways to integrate the MYP into classes. Lessons are modeled to demonstrate for teachers a variety of successful ways to integrate an Area of Interaction into their teaching. Teachers and administrators have visited MYP schools in Virginia and the District of Columbia in order to observe MYP with students in action.
3. Mid-Atlantic Regional Conference (MARC) networking is organized by local IB schools within the region. These opportunities allow area teachers to address issues specific to their disciplines or areas of interest. Staff members at both the middle and

feeder high school continue to attend MYP national and local training. MYP staff members meet in several configurations throughout the year. Under the directives of a Model Campus Initiative, teachers and administrators meet as an entire staff and in various committees. Groups of teachers from grades seven through ten meet quarterly to discuss and facilitate a seamless subject curriculum. Vertical articulation begins early on between the high school and the middle school, and staff development sessions focusing on curricular issues in both schools continue.

Staff training is critical to the success of the program. In addition to the initial program training, IB provides numerous professional development opportunities for teachers who are recognized for competence in the curriculum and, in general, the MYP. A range of training opportunities have fostered an understanding of the program. Department meetings, which occur monthly throughout the year, provide an opportunity for teachers to share ideas, to gather information, and to align curriculum. At the IBMYP school, teachers meet in interdisciplinary teams three times per week and once a week in respective professional learning communities (Dufour, 1998) to discuss instructional issues, students, and curriculum. Due to high cost of training teachers in both local and national settings, it is important to minimize staff turnover as much as possible. Executing the program is time consuming; thus, maintaining a fully trained staff limits the repeated cost of training and further enhances vertical articulation within and between the MYP and DP (see Table 2.1). At the end of each school year, both the MYP and DP must engage in an assessment of staff development needs for the upcoming year.

Table 2.1

MYP Training – IB Diploma High School/IBMYP Middle School 2003 – 2004

<i>Training Type</i>	<i>Form of instruction</i>	<i>Targeted population</i>	<i>Purpose of training</i>	<i>Notes</i>
Basic training	In-house	New teachers	To provide teachers new to MYP middle and South Lakes High Schools an introduction to IBMYP	Required training
Technology integration (design cycle)	In-house	All teachers	To provide all teachers with the necessary tools to integrate technology instruction across all disciplines	Required training
Subject-area	IB North America-sponsored training	Select subject-area teachers	To provide teachers with two or more years of experience teaching within the MYP with additional, subject-focused training	At discretion of the school administration

<i>Training Type</i>	<i>Form of instruction</i>	<i>Targeted population</i>	<i>Purpose of training</i>	<i>Notes</i>
Areas of Interaction	IBNA-sponsored training		To provide teachers with two or more years of experience teaching within the MYP with training focused on the inclusion of thematic topics within classes	At discretion of the school administration
Assessment	IBNA-sponsored activity	Final-year teachers	To provide final-year teachers (10 th grade) with training in the assessment and moderation process	At discretion of the school administration
Curriculum moderation	IB Curriculum and Administration	Select subject-area teachers	To provide select teachers with training in moderating MYP assessments in support of IBO	By application and invitation only
Regional Conference	IBNA-sponsored activity	School and program administrators	To provide leaders with access to conference sessions that identifies exemplary programs and activities.	At discretion of the school administration

Intercultural Understanding and the Middle Years Program

A major MYP principle is that schools must promote intercultural understanding as a holistic view of knowledge and communication (IBO, 2005). The role of the school for the student does not include only those aspects traditionally viewed as academic. MYP schools provide the cultural and intellectual context within which learning occurs, and although these contexts require various explanations and descriptions to convey, they are critically important for the success of the educational program. At the IBMYP school, extensive efforts and focus have been applied in these areas.

The initial tone for promoting understanding is set through the principal's daily use of the school-wide announcement system to inspire students using the accumulated wisdom of the previous thousand years' quotations, stories, anecdotes, philosophical statements, and tales from history and across the globe that provide a daily context for their work. Class work and team activities include lively discussions of current events, cooperative learning activities, and an integration of these topics in the day-to-day curriculum. Beyond the classroom, special programs such as peer mediation training utilize mediators from all cultures to negotiate student conflicts. Foreign language clubs and the International Club both work to promote the frequent celebration of the many cultures represented in the school. The increasing diversification of the IBMYP school's student population speaks to the implementation of an academic program with an emphasis on a more global education. Additionally, teachers are encouraged to employ translators for parent conferences, and translators are also made available during school meetings and community events.

The planned community within which the IBMYP middle school is located was founded on principles of social and economic integration. The physical structure of the community, from

its town centers to its diverse employment base and its range of housing, reflects a place that is comfortable with differing incomes, views, and cultures. The community school also reflects the community's perspective and strongly supports the school's efforts to promote intercultural understanding.

The Curriculum and the Middle Years Program

Involvement in the MYP and adoption of its curriculum presupposed a perspective of knowledge that was broad, complete, and appreciative of the interrelatedness of subjects. At the IBMYP school, an emphasis on this holistic approach assisted in integrating the district's POS, schedules, planning, and research into the implementation of the program. At an administrative level, creative school master schedules allowed support for teaming, an approach based on research regarding improved student learning. Projects across disciplines were encouraged whether teachers worked as part of a team in the middle school, or worked within disciplines in the high school. In addition, the IBMYP school and the DP high school participate in the Model Campus Initiative, allowing vertical teaming and articulation for teachers from both schools to occur frequently.

The adoption of the MYP at the study school coincided with community change and development, neither of which could be successful without a commitment to an open exchange of ideas and concerns and a belief that human relationships are founded on the ability to communicate. At the IBMYP middle school, the technical capacity for communication was as strong as one would expect to find within a greater community that served as one of the major Internet and data exchange hubs for the United States. Internally, however, a school's capacity for communication is built on personal relationships and rigorous dialogue in a supportive

environment. Communication of ideas and learning approaches to students remain a top priority at the IBMYP School. Lessons, activities, and assessments used in the classroom facilitate the development of written and oral language skills. Students are informed of the MYP criteria through the use of rubrics, are taught to work in peer revision groups, and are encouraged to adopt the habits of reflection and self-assessment. To reinforce this practice, “writing to learn” is a routine process used in classes to facilitate students’ abilities to consider and question the difficult concepts of their curriculum. Discussions, debates, and formal and informal presentations, both individually and in groups, are part of every discipline. In addition, the school supports the acquisition of a second language for all students, encouraging them to begin their foreign language study beginning in year two or grade seven.

The integration of the IBMYP study school into the international community of IB schools offers advantages to both the suburban schools as well as to schools currently implementing the MYP and DP programs. The IBMYP middle school serves a unique school community and provides a balance of academic and community services that reflects the characteristics of the people who live there. This community was founded on the premise that people would be able to work, play, and live together with service being a component of the community.

Students and the Middle Years Program

Students initially learned about the MYP through their teachers and classroom activities, in addition to school-wide programs designed to familiarize them with the underlying MYP philosophy. The MYP philosophy and vocabulary were introduced to students through a collaborative, school-wide activity that introduced and reinforced the MYP themes and Areas of

Interaction. In addition, teachers at all grade levels introduced the Areas of Interaction within their classrooms and discussed them in relation to content and assignments. Students discussed the rubric criterion for all the subject areas and were assessed according to MYP standards. Students were guided to make connections from subject to subject and to the broader real world. Techniques that focused on higher achievement at the IBMYP school are achieved through an instructional lesson plan framework (Instructional Services Department, 2005) called LEARN (see Figure 2.5) for teachers that:

1. Focuses on those factors that influence higher student achievement.
2. Assumes there is alignment among the written, taught, and assessed curriculum.
3. Encourages teachers to provide instruction at the right level of difficulty for each student.
4. Promotes teacher use of on-going assessments for diagnostic purposes to determine prerequisites, and acquisition and mastery of the learning.
5. Allows teachers to achieve the highest level of differentiation.

Both the MYP and county POS mesh together well to offer students a rich curriculum, in which all students are learning. Teachers work collaboratively in teams and PLCs to achieve the goals of the division and IBO.

Figure 2.5 (Copyright 2005, Robert Harrison and James Albright, Jr.–IBMYP Coordinators)

IB Middle Years Program and the LEARN Model

**South Lakes/Langston Hughes
International Baccalaureate
Middle Years Program**



Link

The five **Areas of Interaction** function as the links that connect what students have learned in school, what they are learning and doing in other classes, and what they already know from the rich variety of life experience that our multicultural student body brings to every classroom.

Engage and Explain

Learning outcomes are based on MYP **Subject Area Aims and Objectives**. These powerful concepts suggest how students will be changed by instruction. Specific targets for learning form the basis for the **assessment criteria** by which you will judge student achievement. **Guiding Questions** engage students in a process of discovery that creates the habits of mind needed by life-long learners.

Active Learning

Teachers use a variety of **Approaches to Learning** (and explicitly teach students how to use them, too) as they meet a variety of student learning needs and styles.

When students work together, they are engaging in **Social Education**, gaining life skills through cooperative problem-solving.

Service learning gives students an opportunity to make a difference in their **Community**, providing real-world experience in working toward a common solution

Students begin taking responsibility for their own learning and their long-term place in the world by exploring **Environment**. Interdependence and interaction can be modeled through classroom experience.

Students use and develop integrated materials and design Technology as they study humankind’s creative potential and begin to develop a concept of themselves as **homo faber**.

At an IBMYP school, instruction includes an **international** component that fosters intercultural understanding and respect.

Reflect

Reflective learning is a hallmark of the IB student profile. As part of the **design cycle**, students evaluate the quality, effectiveness, process efficiency, and social significance of their products and solutions. Reflection is both an individual and group process. Realistic reflection that leads to growing sophistication in behavior and learning strategies is a key component of **Approaches to Learning**.

Now and Then

Teachers guide students toward future learning, connecting students’ new-found skills and knowledge with the **personal project**, in which personal interests, cross-curricular studies, active learning, and metacognitive reflection find their fullest expression in the Middle Years Program.

Parents and the Middle Years Program

The MYP coordinator and liaison discussed academic and personal goals with the IBMYP students and parents in order to assist them in planning their academic program with a focus towards the students' future involvement in the IBDP. Consultation with parents in the community was designed to reach as many parents as possible. Monthly articles in the school newsletter offered updates on MYP activities, and the MYP coordinator presented information during the Parent-Teacher-Student Association (PTSA) meetings throughout the year in a variety of community locations and in different languages using translators. Spring and fall informational meetings informed parents of students at specific grade levels about MYP. Curriculum and assessment workshops were planned to increase parent understanding of MYP. Local elementary schools also supplemented the middle school meetings to inform and prepare parents of future MYP students. To ensure a smooth transition, the coordinator and liaison conducted tours of the building with rising sixth-grade students and families from the feeder elementary schools. In addition, they discussed the merits of the MYP with families who were not community members but wanted to place their children in the school to take advantage of the MYP.

Parent perceptions about the quality of the academic program at schools implementing IBMYP in the district are relatively positive. The County's Department of Educational Accountability (DEA) reports that in the initial implementation phase (2000-01 school year), approximately 75% of almost 450 middle school parent responses gave high ratings (good to excellent) to the IBMYP schools on acceptance of diversity among students, teacher knowledge, principal leadership, and curriculum quality (Hinson, 2005). Parents believed that the middle schools' academic programs included specific IBMYP Areas of Interaction such as health and

social education, environment, teaching children about their own communities, and teaching children how to make informed choices about their own well being. Parents were not surveyed during the 2004-05 school year, but based on the spring 2005 surveys and interviews, school staff and central office staffs were of the opinion that:

1. Parents felt positive about and support the IBMYP. (13 of 15 staff responses)
2. There is a need to clarify program benefits to parents who, at times, are misinformed or not informed about what the program has to offer students. (3 of 15 staff responses) (Hinson, 2005)

Although most parents held positive opinions regarding the program, some continue to be skeptical, citing uncertainty of the international nature of the program as it relates to the American system of education. A need to clarify the benefits of the program to rising middle school parents who, at times, are misinformed is ongoing.

Administration and the Middle Years Program

Effective school leadership is a critical factor in implementing a successful IBMYP. The administration provided a variety of professional development opportunities in support of the program, such as introductory seminars and training events for experienced as well as new teachers in central locations through the IBO's regional network. Teachers, as well as administrators, were required to participate. Ranges of school-based services tailored to meet the requirement of individual schools were also available. Curriculum support materials, both printed and electronic, were developed by the organization for use with the IBMYP framework. The MYP middle school purchased full ranges of materials to support IBMYP curriculum development and implementation.

A full-time coordinator oversees the program at both the MYP middle school and high school. In addition, a part-time liaison assists the coordinator in linking the middle and high school programs. The MYP coordinator and liaison consulted regularly with staff from the school division's instructional services office, which was responsible for system oversight of the IB programs. The program as implemented was continually evaluated by the school system's office of planning and testing. Also, North Carolina and California MYP principals consulted with the IBMYP study school staff and met with MYP coordinators and principals to discuss the program and how it could be implemented within each of the schools in the district. The school division in which the IBMYP school resides continues to facilitate quarterly discussions with MYP coordinators and the principal to ensure that the mission, vision, and goals of the division and IBO are met.

Many challenges to full implementation of the program at the IBMYP middle school have arisen. Such challenges include:

1. High staff mobility precludes having a fully trained staff at all times.
2. Maintaining focus and consistency for staff requires extensive time.
3. The time required to execute the program often conflicts with other district initiatives.
4. Creative staffing is required since the district does not provide additional staffing.
5. The program requires a high degree of articulation with the high school administration and teachers.
6. Not enough time exists for the coordinator to implement the program fully at both the middle and high schools (Hinson, 2005).

Standardized Achievement Tests

This study uses scores from standardized tests to measure achievement growth in the intervention group. A test has been standardized after it has been used, revised, and used again until it shows consistent results, and average levels of performance have been established. Achievement testing plays a vital role in education today. Results from such tests have major implications for shaping public opinions about the quality of schools. Educators can use these assessment results to help improve teaching and learning and to evaluate programs and schools. Assessments such as these are also used to generate data on which policy decisions are made (CTB, October 1999). Achievement tests can determine whether students know and understand what they are taught. Additionally, they can help identify schools that need to improve performance. A standardized achievement test should provide the user the information concerning an individual's knowledge or skills so that the user can make decisions about selection, classification, academic and vocational counseling, or about the relative effectiveness of two or more methods of instruction (Mehrens and Lehmann, 1991).

Standardized tests have advantages over teacher-made tests. Teacher-made tests are often specific to a particular teacher and cannot be normed with an entire school or larger population. Standardized tests have larger norms and are often more carefully developed. For these reasons, they are especially helpful in analyzing curricula or assessing the relative achievement of different groups (Thorndike and Hagen, 1977).

Standardized achievement tests have shortcomings, however, not the least of which is student performance, which is heavily influenced by three causative factors, only one of which is linked to instruction. The three factors that contribute to students' scores on standardized achievement tests are:

1. What is taught in school?
2. What is the student's native intellectual ability?
3. What is the student's out-of-school learning?

Students' out-of-school learning can be linked to their families' socioeconomic status, which is highly correlated with standardized test scores (Popham, 1999). It should be noted, however, that in this study the curricula taught in school were the same for all students, and the sample populations were matched accordingly to their fifth-grade SOL scores. Further, the students' demographic information was similar.

As stated before, the MYP does not define student success in terms of standardized test scores. Such data does align, however, with the MYP program's goals and objectives. This research did not use the achievement test scores for anything other than what they were designed to measure. This study was not looking for predictors of success; it was comparing scores from two populations participating in two different school programs.

The use of data from standardized achievement tests is not uncommon in research designed to compare two programs. For example, a study conducted in Canada to determine whether significant differences existed between home-schooled and conventionally schooled students used the Alberta Provincial Test. It discovered there was no significant difference in student achievement (Watkins, 1997).

The Virginia Standards of Learning

Virginia SOL test results are evaluated to answer the questions about differences in achievement levels of students. Grade 8 end-of-year SOL test results provided the data for the

study. Student ethnicity was also considered as a control variable; however, it should be reiterated here that the IBO does not define student success in the MYP in terms of achievement test scores. Using SOL achievement tests as a part of this study is due to the expectations of parents, the division, and the state. All Virginia public school students are expected to complete successfully and pass state SOL achievement tests. The level of attainment on SOLs is the criterion by which all public schools in the Commonwealth are measured for accreditation and funding. This study is not looking for predictors of success but comparing scores from two populations participating in two different school programs.

This study uses scores from the Virginia SOLs published by Harcourt Assessment, Inc. (Virginia Department of Education, 2004). The test designers describe the SOLs as an assessment series that provides an evaluation of student achievement. The assessments include selected response tests with complementary performance assessments and questions that closely match teaching strategies and curriculum. The data can be used by teachers to improve future learning.

The SOLs in the areas of English, Reading, Mathematics, History/Social Science, and Science are intended to set reasonable targets and expectations for what teachers are expected to teach and students are expected to learn (Harcourt, 2004). The purposes of the educational assessments at selected grade levels (3, 5, and 8) and in high school subjects are to inform parents and teachers what students are learning in relation to the SOL and to hold schools accountable for teaching the SOL content.

The history of SOL testing began in the Commonwealth when the Virginia Board of Education appointed the SOL Test Technical Advisory Committee in September 1999 to

ascertain the validity, reliability, equating, and standard settings of its assessments. A review of the selected technical characteristics is important in that all aspects of the assessment process, from preparing the SOL for guiding the test specifications, to writing test items, test scoring, test administration, test security, and standard-setting and equating, influence the validity of scores and associated performance category classifications from the associations (Virginia Department of Education, 2005).

1. Validity is a property of scores obtained from an educational assessment and concerns the extent to which the scores are useful for their intended purpose. One important type of validity that concerns the extent to which tests items are providing information about the intended SOL is called “content validity evidence.” The procedures used to investigate the content validity are adequate, and extensive procedures are in place to make the determinations using teachers from Virginia and measurement specialists (Virginia Department of Education, 2005).
2. Another aspect of content validity is called “domain validity,” which concerns the extent to which the test specifications (these are the details about what the test should measure and statistical criteria for the tests) are reflective of the SOLs. Are the test specifications broadly measuring the SOLs? The technical report noted that there is one possibility that the assessment measures may not guarantee an adequate representation of the SOL. For example, students are often asked to perform an activity or interpret the meaning of a reading passage. A multiple choice format is used. Multiple choice test questions may be suited for some of the SOLs but may not be as effective in assessing other SOLs. The SOL assessments are composed exclusively of multiple choice questions; therefore, it is possible that some of the

standards are not fully reflected in these assessments (Virginia Department of Education, 2005).

3. Methods for identifying potentially biased items are also in place. These are test items that are functioning differentially in subgroups of interest such as subgroups formed based on gender or ethnic background. Steps have been taken to identify these problematic items using both statistical and judgmental reviews. Standard statistical procedures are used, as well as the committees of Virginia teachers. Both approaches for identifying these items functioning differentially in subgroups of interest are standard procedures in state assessments (Virginia Department of Education, 2005).
4. Documentation on the construct validity of the assessments is available in the form of correlations of SOL assessment score with grades 4, 6, and 8 standardized achievement test scores (Here the Stanford 9 Achievement Test was used).

Correlations between the SOL assessments and standardized achievement tests might be expected to be in the .50 to .80 region, and they are. The correlations are neither too high nor too low, lending support for the validity of the SOL assessment scores. If the correlations were higher, then it might be said that the SOL assessments are measuring nearly the same knowledge domains and skills as the standardized achievement tests, and vice-versa. Validity evidence would be available to support the SOL assessments, but it could be said too that the need for the Virginia assessments would be reduced. The correlations should not, however, be too low, either because this may indicate problems with the reliability of scores on the SOL assessments or suggest that Virginia is very much out of step with other states in its curriculum frameworks (Virginia Department of Education, 2005).

5. Reliability is a characteristic of the scores and concerns, in the case of the Virginia assessments, the internal consistency of scores and the consistency and accuracy of assigning students to performance categories. A well-known and widely accepted reliability statistic, the Kuder-Richardson Formula 20 (KR-20) was used to estimate the internal consistency reliability of each grade and form of the multiple-choice SOL assessments. A second statistic, a less well known statistic, “person separability index,” was used to estimate the reliability of each grade and form of the writing assessments. Standard errors of measurement were also reported for each grade and form of the assessments (Virginia Department of Education, 2005).
6. Reviewing the descriptive statistics reported in the tables that contain the reliability coefficients in the test manual suggests that the mean raw score should also be reported as a proportion of maximum scores. This change would facilitate the comparison of assessments that vary in length for the different subject areas. Also, the conditional standard error of measurement should be reported at the Proficient and Advanced performance standard. It is the sizes of the errors in scores near the performance standards that are of special interest when interpreting scores and evaluating the suitability of the assessments for achieving the desired purposes (Virginia Department of Education, 2005).
7. Many statistics mentioned are provided for each form of the assessment grade level. The forms are labeled Core 1 and Core 2; Core 1 is the primary assessment taken by the vast majority of the students, and Core 2 is the make-up assessment taken by students who missed the administration of Core 1 assessment (Virginia Department of Education, 2005).

8. Evidence is also provided in the manual concerning the inter-rater reliability of the scoring of the writing prompts. These reliability estimates are strong, suggesting that training and quality control on the scoring is adequate (Virginia Department of Education, 2005).
9. Taken collectively, the reliability evidence for the SOL assessments is solid and typical of high quality assessments. In general, the assessments meet or exceed the reliability standards (Virginia Department of Education, 2005).
10. Equating or *s* score equating is a statistical procedure that must be carried out to insure that the Core 1 and Core 2 assessments in a single year, and from one year to the next, are statistically equivalent. Assessments of equivalent difficulty are needed to insure fairness to students, and to insure meaningful interpretations of the assessments of equivalent difficulty, but this turns out to be rather hard to do because of a finite number of items available to build forms and the necessity of using pretest item statistics. Equating of scores is common in the testing field. There is probably not a state assessment in the country that does not do statistical equating of scores across multiple forms and from one year's assessment to the next (Virginia Department of Education, 2005).
11. Standard Setting is the process of determining the levels of achievement required of students to be placed into the performance categories of interest. In Virginia's SOL, there are three performance categories labeled, "Did not pass," "Proficient," and "Advanced." Sufficient details are also available about the process for full reviews to be carried out. The state department and its contractors have chosen and implemented two methods for standard settings (the Angoff method and the

Bookmark Method) that are acceptable for multiple choice assessments, and the evidence seems to be that the methods have been appropriately implemented (Virginia Department of Education, 2005).

Based on the review completed by the Virginia Department of Education, its contractors are following standard procedures for the design and implementation of the state testing program. There is evidence that the educational assessments are being developed in a professionally responsible way; there is evidence of content and construct validity; both score and decision consistency are high; and performance standards were set in a defensible way (Virginia Department of Education, 2005).

This study will analyze scores in five areas: English, Mathematics 8, History/Social Science 8, Science 8, and Reading 8. The total English score was comprised of language mechanics and language expression subtests. These subtests work together to measure a broad range of language and writing skills. Test items were designed to measure capitalization; punctuation; the ability to construct effective sentences; the ability to combine simple sentences into more concise, but efficient longer sentences; and the ability to construct meaning from written text (Harcourt, 2003) (see Appendix A).

The total reading subtest was designed to measure students' awareness of the concepts of print and the sounds and structure of language; use independent reading strategies to read fluently and with comprehension; understand the structure of words and language; interact with a broad array of quality literature that would engage their reading skills (Harcourt, 2003) (see Appendix A).

The total mathematics score was comprised of the mathematics computation and mathematics concepts and applications sub tests. These subtests were designed to assess students' ability to perform fundamental mathematics operations, apply mathematical concepts, and use a variety of problem-solving strategies (Harcourt, 2003) (see Appendix B).

The total history/social science subtest was designed to measure students' understanding of a variety of disciplines including geography, economics, government, citizenship, and history. The subtest also included questions on chart and map reading (Harcourt, 2003) (see Appendix C).

The total science subtest was designed to develop and use scientific inquiry; use the language of science to communicate understanding; investigate phenomena using technology; apply scientific concepts, skills, and processes to everyday experiences; experience the richness and excitement of scientific discovery of the natural world through the historical and collaborative quest for knowledge and understanding; make informed decisions regarding contemporary issues; and develop scientific dispositions and habits of mind (Harcourt, 2003) (see Appendix D).

In conclusion, for the purposes of this research, it was assumed that achievement tests, which have been standardized, would provide reliable and valid data on student performances. Standardized achievement tests are often used to compare student achievement in different school programs. These findings are important to educators who are charged with finding and evaluating strong programs for their students.

CHAPTER III

METHOD AND DESIGN OF THE STUDY

This chapter will present the method and design for the study. It will discuss the intervention and control groups, variables, data collection, and analyses that were utilized.

The purpose of the study was to examine the Commonwealth of Virginia's SOL achievement test results for students participating in the IBMYP and compare their achievement with students of similar ability in schools not authorized to offer the MYP. It was important to determine if the MYP students, who were learning in a different and more holistic manner, were still competitive relative to their counterparts on standardized achievement measures.

The school district included in the study was racially, economically, and linguistically diverse (see Table 3.1 and Table 3.2). During the year of the study, the IBMYP was offered at three middle schools within the 12th largest school system in the United States, with a seventh- and eighth-grade student population of over 26,899 in spring 2004. The school district's instructional services department defined the need to implement the program as a means of strengthening the academic reputation and instructional program at the schools. Due to the district's large size, it is divided into eight administrative areas called Clusters ("Clusters" I through VIII) with comparable student enrollment totals. The IBMYP middle school is located in Cluster VIII in the northern corner of the County. Its student enrollment in 2004 was 893.

Table 3.1

School Program Data

	<i>Suburban school district as of June 2004</i>	<i>IBMYP middle school as of June 2004</i>
Total school membership	162,869	893
Total free and reduced lunch percentage	21.40%	31.47%
Total mobility	16.06%	13.81%

Table 3.2

Comparison of Student Ethnicity

	<i>Suburban school district as of June 2004</i>	<i>IBMYP middle school as of June 2004</i>
American Indian/Alaskan	.4%	.3%
Black	10.75%	18.70%
Hawaiian	0.0%	0.0%
White	52.49%	45.24%
Asian/Pacific Islander	17.03%	14.33%
Hispanic	15.05%	16.01 %
Multiracial	4.0%	4.8%
Undesignated	.3%	.4%

The researcher examined student gains in the NCLB categories of Mathematics 8 and Reading 8, and other state accreditation SOL scores including History/Social Science 8, Science 8, and English 8. Secondly, differences between achievement scores were determined from SOL test results for subgroups of students who participated and those who did not participate in International Baccalaureate Middle Years Program schools. The subgroups examined included: Black, Hispanic, and White students.

Sample

The sample was organized into intervention and control groups, which were statistically similar. In order to determine if the intervention and control groups were statistically similar at the onset of the study, baseline data were established. The researcher examined the Grade 8 SOL scores of students participating in an authorized MYP school and compared them with the scores of students across the division at schools not participating in the program.

The selection of the intervention group included eighth-grade students from an IBMYP authorized school, who had completed their eighth-grade SOL tests in Spring 2004; who had a valid fifth-grade SOL achievement test score, which was the last year that the student had been administered an SOL test; and who were in classes with teachers trained in IBMYP methodology. Descriptive statistics were performed on the mean scores of the grade 5 SOL scores of both groups to confirm the closeness of the match in prior achievement before the intervention occurred. Due to teacher mobility, the level of teacher training in the MYP varied. Only students whose teachers were fully trained in MYP methodology were included in the study. Students in classes with untrained teachers or students without fifth-grade SOL scores were not used in the study. This procedure was done by content area so if the student had a

Grade 5 Reading score but not Science, their grade 5 SOL scores could be used in the Reading analysis but not in the Science analysis. Contact with students did not occur, nor were names used to identify students. Only student test scores were under study (see Table 3.3).

The control group included students who were matched by ethnicity and fifth-grade SOL scores for each content area. All students were sorted by ethnicity and then by prior performance to determine a match. Division-wide data were sorted in a similar fashion. Students were matched one-by-one by content area. First, all control students who matched the intervention students were selected; then, all the control students who matched the intervention students' fifth-grade SOL score were selected. If more than one control student matched the intervention student's characteristic, a control student was then randomly selected from the remaining choices to be the matched control student (see Table 3.4).

Table 3.3

Sample Size Summary All Students: Content Area All Students

	<i>N</i>	
	<i>Control</i>	<i>Intervention</i>
Reading	200	200
Writing	332	332
Math	200	200
History	314	314
Science	236	236

Table 3.4

A. Sample Size Summary by Ethnicity: Content Area for White Students

	<i>N</i>	
	<i>Control</i>	<i>Intervention</i>
Reading	108	108
Writing	180	180
Math	110	110
History	169	169
Science	131	131

B. Sample Size Summary by Ethnicity: Content Area Black Students

	<i>N</i>	
	<i>Control</i>	<i>Intervention</i>
Reading	34	34
Writing	60	60
Math	32	32
History	58	58
Science	38	38

C. Sample Size Summary by Ethnicity: Content Area Hispanic Students

	<i>N</i>	
	<i>Control</i>	<i>Intervention</i>
Reading	15	15
Writing	32	32
Math	15	15
History	33	33
Science	19	19

The researcher examined the SOL scores of students participating in an authorized MYP school and compared them with the scores of students from across the school division who were not participating in the program. All students had completed the eighth-grade SOL tests. Scores from the following subtests were under investigation: Math, English, Science, History/Social Science, and Reading. For the study, the use of the 2004 scores was appropriate as the IBMYP program received its authorization in the winter of 2003. One year following the authorization to implement the program would ideally be an appropriate timeframe to establish baseline data by assessing student performance.

In the Commonwealth of Virginia, end-of-year achievement testing is required at grades 3, 5, 8, and 11. Students are required to demonstrate proficiency on the tests in order to advance to the next level of instruction. Students are required to achieve a passing score of 400 in order to demonstrate achievement in the subject matter. All students in the study were judged to have the ability to succeed on the required end-of-year achievement tests. The 2004 scores will provide an overall measurement of achievement of students during their eighth-grade year of middle school. The data are appropriate for investigating the students' proficiency as they exit the middle level and transition to high school.

Variables

The design of the comparative study included as its dependent variable the scores on the Virginia SOL tests given at the completion of a student's eighth-grade year in spring 2004. The data were extracted from students' scores on their Grade 8 Mathematics, English, History/Social Science, Science, and Reading SOL tests. No data were available in the SOL score report to indicate if a student was taking the test for the second time because of a previous failure. The

independent variable was a group variable, membership, as a MYP member or non-MYP member. Another control variable was ethnicity.

Data Collection and Analysis

This research did not require the use of a research instrument. The data that were analyzed were collected from existing student SOL scores available to the school. The researcher examined the SOL scores of students participating in an authorized MYP school and compared them with the scores of students from across the school division at schools not participating in the program. Only students whose teachers were fully trained in MYP were included as participants in the MYP group. The analyses compared the SOL achievement levels of a select group of Black and Hispanic, and White students in a MYP and non-MYP schools.

The SOL tests were administered in March (Writing) and May (Reading, Mathematics, Science and History/Social Science) 2004. At the close of the testing window, the answer sheets were collected, packaged, and sent to the Virginia Department of Education, which scored the tests. The school division received the test results data electronically from the state. Then, the division provided disaggregated data to the students' base schools. The data were coded by pass rates of Fail (0 – 399); Proficient (400 – 499); Pass Advanced (500 – 600), and by demographic information, which included ethnicity, socio-economic status (SES), and gender.

The research for this study was guided by the following four questions:

1. To what extent is there a difference between the SOL achievement scores of students in an IBMYP and the SOL achievement scores of students not in an IBMYP?

2. To what extent is there a difference in the SOL achievement scores for Black students in an IBMYP and the SOL achievement scores for Black students not in an IBMYP?
3. To what extent is there a difference in the SOL achievement scores for Hispanic students in an IBMYP and the SOL achievement scores for Hispanic students not in an IBMYP?
4. To what extent is there a difference in the SOL scores for White students in an IBMYP and the SOL achievement scores for White students not in an IBMYP?

The t test was performed to allow comparisons between the two groups of students to answer the first research question and t tests were repeated for the Black, Hispanic, and White student subgroups to answer the second, third, and fourth questions. The researcher utilized *SPSS 11.5* software for the data analysis.

A t test for two independent samples was used. It was a test that can be used when calculating a wide variety of research problems. For this study, it was used to assess whether the means of the two independent groups were statistically different from each other. This kind of analysis was appropriate whenever a researcher was examining the difference between scores for two groups and when judging the difference between their means relative to the spread or variability in the scores.

In this study, the researcher used one group of subjects who participated in the intervention treatment and selected another group of similar subjects as a control group, who did

not participate in the treatment. The t test is an appropriate design used to compare the intervention and control group.

The spring 2004 Grade 8 SOL scores were tallied for the variables: Mathematics, English, Reading, History/Social Science, and Science. A t test was performed on both group means to determine the statistical difference that existed after the first year of implementation. Additionally, the effect size was calculated to determine the strength or magnitude of the difference between the two sets of data.

The researcher adhered to all the requirements and procedures for seeking approval to use the MYP school and non-MYP schools' data from the district's Office of Educational Accountability and the Institutional Review Board at Virginia Polytechnic Institute and State University before proceeding with the research.

CHAPTER IV

RESULTS

The purpose of the study was to examine the SOL achievement test results of students participating in an IBMYP school and compare their achievement with students of similar ability in schools not authorized to offer the MYP. It was important to determine if the MYP students, who were learning in a different and more holistic manner, were still competitive with their counterparts on standardized achievement measures. As parents, teachers, administrators, and policy makers evaluate the cost, benefit, and efficacy of programs that focus on improving academic achievement, they require sufficient data to assess the anticipated improvement that can be expected with such programs.

The four questions provided the basis for comparing the SOL achievement level of the sample populations in five academic areas were as follows:

1. To what extent is there a difference between the SOL achievement scores of students in an IBMYP and the SOL achievement scores of students not in an IBMYP?
2. To what extent is there a difference in the SOL achievement scores for Black students in an IBMYP and the SOL achievement scores for Black students not in an IBMYP?
3. To what extent is there a difference in the SOL achievement scores for Hispanic students in an IBMYP and the SOL achievement scores for Hispanic students not in an IBMYP?

4. To what extent is there a difference in the SOL achievement scores for White students in an IBMYP and the SOL achievement scores for White students not in an IBMYP?

This chapter will present the results of the data analysis. A summary of the data for each research question is presented in Table 4.0. Table 4.0 shows the results for the t tests, and the p-values for each research question and SOL content area test.

Table 4.0

Research Question Summary

<i>Research Question</i>	<i>t</i>	<i>Test</i>	<i>p-value</i>
To what extent is there a difference between the Standard of Learning achievement scores of students in the IBMYP schools and the SOL achievement scores of students not in IBMYP schools?	1.862	Reading	.063
	.830	Writing	.407
	.471	Math	.638
	.070	History	.944
	.247	Science	.805
To what extent is there a difference in the SOL scores for Black students in the IBMYP and Black students not in the IBMYP?	.738	Reading	.463
	-.841	Writing	.402
	-.936	Math	.353
	-1.504	History	.135
	-.605	Science	.547
To what extent is there a difference in the SOL scores for Hispanic students in the IBMYP and Hispanic students not in the IBMYP?	.956	Reading	.347
	-.422	Writing	.674
	-.006	Math	.996
	-.979	History	.332
	-1.404	Science	.169
To what extent is there a difference in the SOL scores for White students in the IBMYP and White students not in the IBMYP?	1.738	Reading	.084
	1.087	Writing	.278
	.847	Math	.398
	.548	History	.584
	.693	Science	.489

In all four questions, the results indicated that no statistically significant difference ($<.05$) existed between the average SOL scores of students who participated in an IBMYP and students who participated in non-MYP schools across the division.

Table 4.1 shows the mean scaled scores of the intervention group (IBMYP) and the control group (non-MYP students) on each of five grade 5 SOL tests.

Table 4.1

A. Grade 5 Mean Scale Scores for the Intervention and Control Groups: English Reading, Writing, and Mathematics

	<i>English: Reading</i>			<i>English: Writing</i>			<i>Mathematics</i>		
	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>n</i>	<i>Mean</i>	<i>SD</i>
Intervention	200	462.46	60.52	332	470.53	66.01	200	468.74	71.95
Control	200	461.78	59.88	332	470.58	65.82	200	468.76	71.98

B. Grade 5 Mean Scale Scores for the Intervention and Control Groups: History and Science

	<i>History</i>			<i>Science</i>		
	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
Intervention	314	426.03	60.83	236	451.77	52.61
Control	314	425.66	60.51	236	452.10	52.86

The data show that the average Grade 5 SOL performance of the intervention group and students in the control group were similar in all five content areas. There were no statistical differences between the two groups at Grade 5.

Independent t tests were conducted for each content area using spring 2004 SOL data to compare the performance of the intervention group to that of their matched counterparts or control group in the eighth grade throughout the school division. Tables 4.2, 4.3, 4.4, 4.5, and 4.6 show the results of these tests.

Table 4.2

Grade 8 SOL t tests for Total Group English Reading

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
Intervention	200	493.04	76.52	1.862	.063	.186
Control	200	478.04	76.02			

Table 4.3

Grade 8 SOL t tests for Total Group English Writing

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
Intervention	332	451.65	61.58	.830	.407	.053
Control	332	447.70	60.83			

Table 4.4

Grade 8 SOL t tests for Total Group Mathematics

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
Intervention	200	512.90	73.75	.471	.638	.038
Control	200	509.57	67.66			

Table 4.5

Grade 8 SOL t tests for Total Group History

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
Intervention	314	475.15	71.11	.070	.944	.004
Control	314	474.77	64.72			

Table 4.6

Grade 8 SOL t tests for Total Group Science

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
Intervention	236	496.84	66.14	.247	.805	.018
Control	236	495.32	67.85			

Although the performance of the intervention group was higher than the control group in all areas, there were no statistically significant differences ($<.05$). Grade 8 Reading showed the greatest difference between the intervention group and the control group (15 scaled score points). The variation within the intervention group was greater than the variation between the intervention group and control group and most likely prevented the t tests from yielding significant results for the English: Reading, Literature and Research test. However, performance on the History and Social Science and Science SOL tests was virtually identical. All effect sizes were below .20 and would be considered small (Cohen, 1988).

Tables 4.7, 4.8, 4.9, 4.10, and 4.11 show *t* test results by total group ethnicity.

Table 4.7

Grade 8 SOL t tests for Total Group Ethnicity English Reading

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
<i>White students</i>						
Intervention	108	519.82	64.25	1.738	.084	.187
Control	108	504.81	62.65			
<i>Black students</i>						
Intervention	34	419.88	70.81	.738	.463	.145
Control	34	407.59	66.53			
<i>Hispanic students</i>						
Intervention	15	453.47	76.47	.956	.347	.280
Control	15	428.00	69.31			

Table 4.8

Grade 8 SOL t tests for Total Group Ethnicity English Writing

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
<i>White students</i>						
Intervention	180	470.00	56.53	1.087	.278	.094
Control	180	463.58	55.08			
<i>Black students</i>						
Intervention	60	399.23	41.94	-.841	.402	-.133
Control	60	407.05	58.07			
<i>Hispanic students</i>						
Intervention	32	408.78	48.91	-.422	.674	-.089
Control	32	414.42	56.87			

Table 4.9

Grade 8 SOL t tests for Total Group Ethnicity Mathematics

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
<i>White students</i>						
Intervention	110	534.69	65.03	.847	.398	.092
Control	110	527.62	58.89			
<i>Black students</i>						
Intervention	32	437.50	57.13	-.936	.353	-.195
Control	32	451.52	61.70			
<i>Hispanic students</i>						
Intervention	15	465.60	59.73	-.006	.996	-.180
Control	15	465.73	70.62			

Table 4.10

Grade 8 SOL t tests for Total Group Ethnicity History

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
<i>White students</i>						
	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
Intervention	169	500.94	65.82	.548	.584	.047
Control	169	497.21	58.91			
<i>Black students</i>						
Intervention	58	416.24	46.95	-1.504	.135	-.235
Control	58	430.59	55.41			
<i>Hispanic students</i>						
Intervention	33	416.97	55.00	-.979	.332	-.196
Control	33	430.27	55.45			

Table 4.11

Grade 8 SOL t tests for Total Group Ethnicity Science

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
<i>White students</i>						
Intervention	131	520.11	58.91	.693	.489	.070
Control	131	514.83	64.31			
<i>Black students</i>						
Intervention	38	426.79	51.40	-.605	.547	-.114
Control	38	434.08	53.68			
<i>Hispanic students</i>						
	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>ES</i>
Intervention	19	444.63	42.25	-1.404	.169	-.403
Control	19	470.95	70.52			

As with the t tests for the total student population, there were no statistically significant differences between the intervention group and the control group when the data are disaggregated by ethnicity for White, Black, and Hispanic students ($p < .05$). White students from the intervention group consistently performed at higher levels across all content areas than their counterparts in the control group. The content area that showed the greatest differences was English: Reading, Literature, and Research (15 scaled score points). As with the total student population, the variation within the group was substantial ($sd = 64$ scaled score points). The variation within the intervention group was greater than the variation between the intervention group and control group and most likely prevented the t tests from yielding significant results for the English: Reading test. For Black and Hispanic students from the intervention group, the higher levels of performance were limited to the English: Reading, Literature, and Research test. Most effect sizes were below .20 and should be considered small (Cohen, 1988). However, there was one effect size of .40 in favor of the Hispanic control group on the science subtest.

Although not statistically significant, overall, the intervention group had higher scores than the control group in all five content areas with reading showing the greatest difference in scores.

When the intervention group was disaggregated by ethnicity, again, there were no statistically significant differences between the intervention groups and control groups. However, in the intervention groups, White students scored higher than White students in the control groups in all content area. Similarly, Blacks and Hispanics scored higher in one content area, reading.

Results for Each of the Research Questions

1. *To what extent is there a difference between the SOL achievement scores of students in an IBMYP schools, and the SOL achievement scores of students not in an IBMYP?*

The average SOL achievement scores of the IBMYP student group were higher than the control group in all areas; however, there were no statistically significant differences ($p < .05$). Grade 8 Reading showed the greatest difference between the IBMYP students and the control group (15 scaled score points), but the variation within the IBMYP group was greater than the variation between the control group and may have prevented the t tests from yielding significant results from the English: Reading test. Performance on the History/Social Science and Science SOL tests was virtually identical although no significant differences existed between the average SOL scores of IBMYP students and non-IBMYP students. Therefore, the results indicated that no statistically significant difference ($p < .05$) existed between the average SOL scores of students who participated in the IBMYP Program and students in non-MYP schools across the school division. Follow-up effect size testing was conducted to determine if sample size had an impact on the power of the t test. All effect sizes were below .20 and would be considered small (Cohen, 1988).

2. *To what extent is there a difference between the SOL achievement scores of Black students in an IBMYP and the SOL achievement scores of Black students not in the IBMYP?*

The Black students' highest level of performance was English: Reading, Literature, and Research test; however, there were no significant differences between the average SOL scores of Black IBMYP students and Black non-IBMYP students. The results therefore indicated that no statistically significant difference ($p < .05$) existed between the average SOL scores of students

who participated in the IB MYP Program and students who participated in non-MYP schools across the school division. Follow-up effect size testing was conducted to determine if sample size had an impact on the power of the t test. Most effect sizes were below .20 and should be considered small (Cohen, 1988).

3. *To what extent is there a difference between the SOL achievement scores of Hispanic students in an IBMYP and the SOL achievement scores of Hispanic students not in an IBMYP?*

The Hispanic students' highest level of performance was in the English: Reading, Literature, and Research test; however, there were no significant differences between the average SOL scores of Hispanic IBMYP students and Hispanic non-IBMYP students. The results therefore indicated that no statistically significant difference ($p < .05$) existed between the average SOL scores of students who participated in the IB MYP Program and students who participated in non-MYP schools across the school division. Follow-up effect size testing was conducted to determine if sample size had an impact on the power of the t test. The effect sizes were below .20 and should be considered small (Cohen, 1988). However, there was one effect size of .40 in favor of the Hispanic control group on the science subtest.

4. *To what extent is there a difference between the SOL achievement scores of White students in an IBMYP and the SOL achievement scores of White students not in an IBMYP?*

White students from the IBMYP group consistently performed at higher levels across all content than their counterparts in the control group. The content area that showed the greatest differences was English: Reading, Literature, and Research (15 scaled score points); however, there were no significant differences between the average SOL scores of White IBMYP students

and White non-IBMYP students. The results therefore indicated that no statistically significant difference ($p < .05$) existed between the average SOL scores of students who participated in the IB MYP Program and students who participated in non-MYP schools across the school division. Follow-up effect size testing was conducted to determine if sample size had an impact on the power of the t test. Most effect sizes were below .20 and should be considered small (Cohen, 1988).

As noted earlier, overall, the IBMYP seemed to be associated with higher Reading scores as compared to other content areas and for White students than Black and Hispanic students at the IBMYP middle school.

CHAPTER V

FINDINGS, CONCLUSIONS, DISCUSSION AND RECOMMENDATIONS

Summary of the Findings

In this age of accountability, states have rushed to set new standards that define what students should know and be able to do. These standards are viewed by policymakers as important to improving education and are intended to address the perceived low level of achievement by students on the state standardized tests. To help meet the standards and to measure progress, states have designed and implemented assessment systems that are intended to support improved student achievement. In response to these standards of measurement, school districts across the country have sought instructional initiatives and programs, such as the IBMYP, to improve the learning and achievement for all students.

The purpose of this study was to examine the SOL achievement test results of students participating in an International Baccalaureate Middle Years Program (IBMYP) and compare their achievement with students of similar ability in schools not authorized to offer the IBMYP. It was important to determine if the IBMYP students, who were learning in a different and more holistic manner, were still competitive with their counterparts on standardized achievement measures.

The IBMYP emphasizes many goals that contribute to achievement, including “life long learning,” good citizenship, acquisition of a foreign language, and holistic thinking, but standardized achievement tests do not measure these learning behaviors (IBO, 2005). Nevertheless, achievement test scores are important to parents, school administrators, school divisions, and State Department of Educations, who are challenged with supporting accreditation and funding criteria. Such tests offer educational leaders comparative and quantified results

regarding the status of a school's instructional program as measured by the state. The results of the scores in this study suggest that IBMYP goals can be pursued and high academic achievement realized with no degradation of standardized test scores.

To perform the study, two groups were identified. One group of eighth-grade students participating in a MYP program and a non-participating group of eighth-grade students were matched by their Grade 5 Virginia SOL achievement scores, and ethnicity. Two statistical tests, a *t* test and effect size, were used to answer four research questions. Independent *t* tests were conducted to determine to what extent, if any, there was a difference between the SOL achievement scores of students participating in the MYP and the SOL achievement scores of students not participating in the MYP. Also, *t* tests were used to measure the extent of difference between the achievement of Black, Hispanic, and White subgroups of the MYP and non-MYP students as measured by SOL scores on five SOL subtests: English 8, Reading 8, Mathematics 8, History/Social Science 8, and Science 8. In addition, the effect size was calculated to determine the strength or magnitude of the differences between the two sets of data. Data were analyzed using *SPSS 11.5*, a statistical software program.

Finally, the findings are from the baseline or first year of implementation. To determine the academic outcomes following the initial year of implementation of the IBMYP, the study focused on the first year of data collection. It is worth reiterating here that the students in both groups were statistically similar based on their Grade 5 Virginia SOL scores and ethnicity at the onset of the study. The evidence that the total intervention group performed at a higher rate than the control group was not a surprise. The findings from the statistical analysis appear below in the order of the research questions.

Research Question 1

To what extent is there a difference between the SOL achievement scores of students in the IBMYP and the SOL achievement scores of students not in the IBMYP?

Research Question 2

To what extent is there a difference between the SOL achievement scores of Black students in the IBMYP, and the SOL achievement scores of Black students not in the IBMYP?

Research Question 3

To what extent is there a difference between the SOL achievement scores of Hispanic students in the IBMYP, and the SOL achievement scores of Hispanic students not in the IBMYP?

Research Question 4

To what extent is there a difference between the SOL achievement scores of White students in the IBMYP, and the SOL achievement scores of White students not in the IBMYP?

In all four questions, the results indicated that no statistically significant difference ($p < .05$) existed between the average SOL scores of students who participated in the IBMYP and students who participated in non-MYP schools across the school division.

Conclusions

Data related to the achievement levels of students on standardized tests were collected from the Virginia Spring 2004 SOL achievement scores for two similar groups of students. The

following conclusions highlight the need for an ongoing examination of the MYP as another middle level program that can be implemented to educate and meet the needs of young adolescents between the ages of 11-16 years old who must perform well on state SOL achievement tests.

Conclusion 1

As a whole, the research literature provides support for the presumed advantages of the IBMYP on the achievement levels of the students. The findings from this study did not yield the overall desired results. The total group scores of the intervention group were higher than the control group in all areas, but not at a level of statistically significant differences ($<.05$). Reading, the basic foundation of learning, showed the greatest difference between the IBMYP group and the control group (15 scaled score points). Because of the emphasis on study skills embedded in the Approaches to Learning design of the MYP, the researcher is not surprised that the Reading SOL scores showed the greatest differences. Although the scores did not reach the threshold of being statistically significant, the mean scores overall showed that the intervention group scored higher than the control group.

Conclusion 2

Despite the fact that the IBO states that their primary goals for students are acquisition of foreign language, learning how to learn, good citizenship, etc. as opposed to high scores on standardized achievement tests, the total intervention group achieved higher scores than the control group on most of the SOL achievement subtests used in this study. However, the Black and Hispanic control groups out performed the intervention group on the science subtests (by 7.3 and 26.3 scaled score points, respectively), although the difference is not statistically significant.

Discussion

While the results of this study over a single year did not yield statistically significant results, that does not indicate that the IBMYP is not an effective program that challenges and motivates student to learn at higher levels. The fact that the mean scores in reading were higher for all subgroups, although not at a statistically significant level, may be an indication that the program may not have been in place a sufficient amount of time to achieve the desired results. Nevertheless, the higher mean scores presented showed that students can participate in the IBMYP without the program compromising their standardized test results. It is important to establish the reasons why a positive shift was found in the scores of some content areas and among some groups.

In an effort to understand the results, the discussion that follows provides an explanation of the findings. Specifically, the discussion speculates that a program such as the IBMYP can be offered as a tool to increase or improve student achievement on standardized tests while providing a more holistic approach to educating students 11-16 years of age.

First, when speculating as to the reason for the less than statistically significant gains by the intervention group, one might consider the curriculum framework and instruction delivered to students. The IBMYP focuses on a methodological framework that should be properly delivered by appropriately trained personnel. Teacher development is central to the success of the MYP. Through the training, teachers learn an educational approach that transcends specific subjects and individual classrooms. They collaborate to develop the content, lesson plans, and instructional materials for the MYP curriculum framework. They also identify skills and knowledge students needed to enhance achievement. When comparing the mean scores of the

students who participated in the MYP and those who did not, one should consider the effect of varying levels of teacher training and competence during the initial year of implementation of instruction.

Second, because the focus of IBMYP is not on SOL achievement, teachers and students had specific instructional and learning expectations that might have prompted a different outcome on specific achievement targets if measured using a different test instrument. According to IBO literature, standardized achievement tests do not accurately measure the success of the IBMYP because many of the types of learning promoted by the IBMYP are not completely captured by standardized tests such as the state SOL achievement tests. The organization provides a set of criteria and assessment standards against which both the school and IBO can measure success. For each standard there is a list of best practices that are common to the MYP program, which indirectly might have had an influence on the results of this study. The MYP is structured around collaborative instructional leadership, community service, personal projects, criterion-referenced and portfolio assessments, exemplar lesson plans, and international mindedness. The researcher believes that a more qualitative or multi-method evaluation process might have been more suited for determining gains in learning. Standardized achievement data are generally utilized nationally to evaluate the efficacy of educational programs, which controls governmental funding and program selection. According to Berliner (1994) until educational systems allocate more time and funds to appropriately evaluate programs on criteria beyond standardized testing, research can not definitively assess a program's effectiveness.

Third, the higher mean scores in the Reading SOL by students participating in the IBMYP may have resulted from the Approaches to Learning (ATL) design of the IBMYP

framework. The middle school in the study utilized the ATL design to institute a major focus on literacy throughout the building. The Approaches to Learning, which develops effective study skills, included a component that exposed students to tutorial opportunities and required IBMYP students to participate in sustained silent reading (SSR) three times a week during the ATL time. As a result, one might conclude that attaining the higher mean scores in reading scores was related to the IBMYP ATL design. Increased reading scores is not a specific goal of the IBMYP.

Fourth, the small sample size within the various ethnic groups being tested may have influenced the power of the t during testing. Sample size can influence the chance of statistical significance. Sample size is assumed not to be too small. If a sample size is too low, the results may lack the precision to provide reliable answers to the questions. Since significance tests reflect both strength of association and sample size, making inferences based on small samples could be misleading. One can never be sure what will happen in a particular study; however, in this study, a larger sample size might have yielded a statistical test that may have produced greater significance.

Fifth, the failure to find significant differences in the mean scores for minority students in areas other than reading may indicate that the IBMYP may have a greater effect in later years, as reading skills enhance students' ability to perform in other areas of study.

IBO literature emphasizes the importance of providing an academic framework that challenges students and promotes the skills necessary for living life as an adolescent (IBO, 2005). The researcher believes that this would lead to implementing a demanding academic program designed for young adolescents aged 11-16 without compromising standardized test results. The IBO encourages an inclusive program in all of its documentation although it allows

individual school districts to implement a program for specific categories of students (IBO, 2005). Even students not awarded the full certificate will still benefit from participation in the program—an inclusive structure raises the bar for all students. Nothing in the IBMYP structure is intended to limit participation in *any* elements of the program. The IB Curriculum and Assessment office (IBCA) is currently developing an MYP teacher guide to support the inclusion of special education, gifted, and other, non-traditional students. Traditional accommodations mandated for special education students are recognized at all levels of MYP. As with SOLs, accommodations are intended to remove barriers to performance for students with disabilities; in no case, however, (either SOLs or MYP final year assessments) do accommodations reflect a reduced level of assessment rigor. Provisions are made for students who have accommodations that may limit their enrollment in all eight subject areas. The IBCA recently completed a guide for second-language learners, identifying multi-lingual students as exemplars of student internationalism (IBO, 2005).

The analysis of the results of this study suggests that much remains to be done to fully implement the program at the school in the study to address increasing the achievement level of students on standardized tests. Adoption of the IBMYP can be viewed as providing a valuable framework for considering the many aspects of middle school education and achievement. Full implementation of the IBMYP has not yet been achieved. The first class to participate fully in the IBMYP will not complete their work for the certificate until the end of the 2006 school year. Empirical evidence for the relative success of changes caused by the IBMYP cannot be provided authentically until such a time when schools have graduated their first IBMYP class. Full completion implies four to five years within the teaching structure, completion of assessments, and creation of the IBMYP Personal Project activity in 10th grade. The Final Year assessment

process (now in development) will result in internal standardization of assessment. Teachers will work in instructional teams to develop assessment tasks and work with subject colleagues to standardize the assessments to provide validation that equivalent standards are applied throughout a school (Hinson, 2005).

Recommendations for Further Research

Several areas for research deserve consideration to assess further the methodologies required for success with improving student gains. Helping all students achieve a passing score on high-stakes standardized SOL achievement tests must be a critical success factor but not at the expense of a well-rounded education. These recommended changes and opportunities for further research are described below:

1. Future research needs to examine the effects of the program after one year in the IBMYP program—grade 7—to determine if this study’s findings can be replicated. A series of longitudinal studies might also be considered.
2. As a follow-up to this study, it would be informative to re-evaluate the intervention and control groups in this study to determine if additional years in the IBMYP have yielded greater gains. Researchers might conduct studies to determine if the IBMYP program gains on SOL tests are sustained over time.
3. In addition, research needs to examine if differences exist between students who attended and those who did not attend an IBMYP program as disaggregated by gender, ethnicity, socioeconomic status, learning ability, and Limited English proficiency. Moreover, a study might be replicated with a larger sample in multiple settings with a more expansive population.

4. The research should expand beyond measures of test gains. Special attention might be given to measures of student attitudes toward the program, as well as motivation and self-image. Additionally, researchers might conduct studies to determine teacher attitudes toward the IBMYP and its implication for teacher development and student achievement. Such an examination might be conducted to understand the extent to which these issues affect student gains on SOL tests.
5. Finally, an area which could be examined for impact is the role the IBMYP plays in increasing accessibility to high school IB Diploma and Advanced Placement (AP) programs.

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APPENDIX A

ENGLISH 8

2004 Standards of Learning

The eighth-grade student will learn and apply interviewing techniques. The student will plan, draft, revise, and edit writing, with emphasis on narratives, exposition, and persuasion. Students will apply reading and writing skills in all subjects, such as communicating results of scientific experiments, reading and describing the relationship between subsets of the real number system, or describing the characteristics and contributions of early civilizations. The student will become a skillful interpreter of the persuasive strategies used in mass media. The student will continue to develop an appreciation for literature through a study of literary elements contained in classic works as well as contemporary selections. The student will describe themes or inferred main ideas, interpret cause-effect relationships, and draw conclusions from a variety of literary selections.

Oral Language

8.1 The student will use interviewing techniques to gain information.

- Prepare and ask relevant questions for the interview.
- Make notes of responses.
- Compile and report responses.
- Evaluate the effectiveness of the interview.

Reading/Literature

8.2 The student will apply knowledge of word origins, derivations, and idioms and will use analogies, metaphors, and similes to extend vocabulary development.

8.3 The student will apply knowledge of the characteristics and elements of various literary forms, including short stories, essays, speeches, lyric and narrative poems, plays, and novels.

- Explain the use of symbols and figurative language.
- Describe inferred main ideas or themes.
- Describe cause-effect relationships and their impact on plot.
- Describe how authors use characters, point of view, and tone to create meaning.
- Compare and contrast the use of the poetic elements of word choice, dialogue, rhyme, rhythm, and voice.
- Explain how a literary selection can expand or enrich personal viewpoints or experiences.

8.4 The student will comprehend what is read from a variety of sources.

Draw on background knowledge and knowledge of text structure to understand selections.

- Analyze details for relevance and accuracy.
- Read and follow instructions to assemble a model or simple structure.
- Evaluate and synthesize information to apply in written and oral presentations.

8.5 The student will write in a variety of forms, including narrative, expository and persuasive writings.

- Use prewriting strategies to generate and organize ideas.
- Focus on elaboration and organization.
- Select specific vocabulary and information.
- Use standard sentence formation, eliminating comma splices and other nonstandard forms of sentences that distract readers.
- Revise writing for word choice, appropriate organization, consistent point of view, and transitions among paragraphs.
- Edit final copies to ensure correct use of pronoun case, verb tense inflections, and adjective and adverb comparisons.
- Edit final copies to ensure correct spelling, capitalization, punctuation, and format.
- Use available technology.

Research

8.6 The student will analyze mass media messages.

- Identify the persuasive technique being used.
- Describe the possible cause-effect relationships between mass media coverage and public opinions trends.
- Evaluate advertisements, editorials, and feature stories for relationships between intent and factual content.

APPENDIX B

MATHEMATICS 8

2004 Standards of Learning

The eighth-grade standards are designed to prepare students for Algebra I. The standards contain both content that reviews or extends concepts and skills learned in previous grades and new content that prepares students for more abstract concepts in algebra. New concepts include solving multi-step equations, graphing linear equations, applying transformations to geometric figures, and using matrices to organize and interpret data. While learning mathematics, students will be actively engaged, using concrete materials and appropriate technologies such as fraction calculators, computers, spreadsheets, laser discs, and videos. However, facility in the use of technology shall not be regarded as a substitute for a student's understanding of quantitative concepts and relationships or for proficiency in basic computations. Students will also identify real-life applications of the mathematical principles they are learning that can be applied to science and other disciplines they are studying.

Mathematics has its own language, and the acquisition of specialized vocabulary and language patterns is crucial to a student's understanding and appreciation of the subject. Students should be encouraged to use correctly the concepts, skills, symbols, and vocabulary identified in the following set of standards.

Problem solving has been integrated throughout the six content strands. The development of problem-solving skills should be a major goal of the mathematics program at every grade level. Instruction in the process of problem solving will need to be integrated early and continuously into each student's mathematics education. Students must be helped to develop a wide range of skills and strategies for solving a variety of problem types.

Number and Number Sense

8.1 The student will use proportions to solve scale-model problems with fractions and decimals.

8.2 The student will simplify numerical expressions involving exponents, using order of operations.

8.3 The student will describe orally and in writing the relationship between the subsets of the real number system.

Computation and Estimation

8.4 The student will solve practical problems involving whole numbers, integers, and rational numbers, including percents. Problems will be of varying complexities, involving real-life data.

8.5 The student will apply the order of operations to evaluate algebraic expressions for given replacement values of the variables.

8.6 The student, given a whole number from 0 to 100, will identify it as a perfect square or find the two consecutive whole numbers between which the square root lies.

Measurement

8.7 The student will verify by measuring and describe the relationships between vertical angles and angles that are supplementary and complementary.

8.8 The student will investigate and solve problems involving volume and surface area of cones and pyramids, using concrete materials and practical situations.

Geometry

8.9 The student will apply transformations (rotate or turn, reflect or flip, translate or slide, and dilate or scale) to geometric figures represented on graph paper. The student will identify applications of transformations such as tiling, fabric design, art, and scaling.

8.10 The student will describe, classify, and construct plane figures and solid figures, including prisms, pyramids, cylinders, and cones.

8.11 The student will verify the Pythagorean Theorem by measuring and then applying the Pythagorean Theorem to find the missing length of a side of a right triangle when the lengths of the other two sides are given.

Probability and Statistics

8.12 The student will analyze problem situations, such as games of chance, board games, or grading scales, and make predictions, using knowledge of probability.

8.13 The student will use information displayed in line, bar, circle, and picture graphs and histograms to make comparisons, predictions, and inferences.

8.14 The student will use a matrix to organize and describe data.

Patterns, Functions, and Algebra

8.15 The student will investigate and describe functional relationships, including the number of sides of a regular polygon and the maximum number of possible diagonals, expressing the algebraic concept of the number of diagonals of the n -sided polygon.

8.16 The student will solve multi-step equations in one variable.

8.17 The student will graph a linear equation in two variables on the coordinate plane, using a table of ordered pairs.

8.18 The student will describe and represent relations using tables, graphs, and rules.

8.19 The student will create and solve problems using proportions, formulas, and functions.

- Data, sorting, and producing reports in various forms.
- Use advanced publishing software, graphics programs, and
- scanners to produce page layouts.
- Integrate databases, graphics, and spreadsheets into word-
- processed documents.

APPENDIX C

HISTORY AND SOCIAL SCIENCE 8

2004 Standards of Learning

United States History to 1877

The standards for grade five relate to the history of the United States from Pre-Columbian times until 1877. Fifth graders will continue to learn fundamental concepts in civics, economics, and geography. This course continues in grade six. In these two years, students study United States history in chronological sequence and learn about change and continuity in our history, study documents and speeches that lay the foundation of American ideals and institutions, and examine the everyday life of people at different times in our history through the use of primary and secondary sources. Teachers are encouraged to use simulations, class debates, projects, or other innovative techniques to make the students' learning experiences lively and memorable. Students should have ample instruction devoted to reviewing and strengthening map and globe skills, skills of using and interpreting information, and historical thinking skills.

- 5.1 The student will describe life in America before the 17th century by
- identifying and describing the first Americans, their arrival from Asia, where they settled, and how they lived, including Inuits (Eskimos), Anasazi, (cliff dwellers), Northwest Indians (Kwakiutl), Plains Indians, Mound builders;
 - Indians of the Eastern forest (Iroquois, etc.), Incas, and Mayans;
 - explaining how geography and climate influenced the way various Indian tribes lived; and
 - evaluating the impact of native economies on their religions, arts, shelters, and cultures.
- 5.2 The student will trace the routes and evaluate early explorations of the Americas, in terms of
- the motivations, obstacles, and accomplishments of sponsors and leaders of key expeditions from Spain, France, Portugal, and England;
 - the political, economic, and social impact on the American Indians; and
 - the economic, ideological, religious, and nationalist forces that led to competition among European powers for control of North America.
- 5.3 The student will describe colonial America, with emphasis on
- the factors that led to the founding of the colonies, including escape from religious persecution, economic opportunity, release from prison, and military adventure;
 - geographic, political, economic, and social contrasts in the three regions of New England, the mid-Atlantic, and the South;
 - life in the colonies in the 18th century from the perspective of large landowners, farmers, artisans, women, and slaves;
 - the principal economic and political connections between the colonies and England; and
 - sources of dissatisfaction that led to the American Revolution;

- key individuals and events in the American Revolution including King George, Lord North, Lord Cornwallis, John Adams, Samuel Adams, Paul Revere, Benjamin Franklin, George Washington, Thomas Jefferson, Patrick Henry, and Thomas Paine; and
- major military campaigns of the Revolutionary War and reasons why the colonies were able to defeat the British.

5.4 The student will analyze the United States Constitution and the Bill of Rights, in terms of

- the British and American heritage, including the Magna Carta, the English Bill of Rights, the Mayflower Compact, the Virginia Statute of Religious Freedom, and the Articles of Confederation;
- the philosophy of government expressed in the Declaration of Independence; and
- the powers granted to the Congress, the President, the Supreme Court, and those reserved to the states.

5.5 The student will describe challenges faced by the new United States government, with emphasis on

- the writing of a new Constitution in 1787 and the struggles over ratification and the addition of a Bill of Rights;
- major issues facing Congress and the first four presidents; and
- conflicts between Thomas Jefferson and Alexander Hamilton that resulted in the emergence of two political parties.

5.6 The student will describe growth and change in America from 1801 to 1861, with emphasis on

- territorial exploration, expansion, and settlement, including the Louisiana Purchase, the Lewis and Clark expedition, the acquisition of Florida, Texas, Oregon, and California;
 - how the effects of geography, climate, canals and river systems, economic incentives, and frontier spirit influenced the distribution and movement of people, goods, and services;
 - the principal relationships between the United States and its neighbors (current Mexico and Canada) and the European powers (including the Monroe Doctrine), and describe how those relationships influenced westward expansion;
 - the impact of inventions, including the cotton gin, McCormick reaper, steamboat, and steam locomotive on life in America; and
 - the development of money, saving, and credit.
-
- The student will identify causes, key events, and effects of the Civil War and reconstruction, with emphasis on economic and philosophical differences between the North and South, as exemplified by men such as Daniel Webster and John Calhoun;
 - events leading to secession and war;
 - leaders on both sides of the war including Abraham Lincoln, Ulysses S. Grant, Jefferson Davis, Robert E. Lee, Frederick Douglass, and William Lloyd Garrison;
 - critical developments in the war, including major battles, the Emancipation Proclamation, and Lee's surrender at Appomattox;
 - life on the battlefield and on the home front;

- basic provisions and postwar impact of the 13th, 14th, and 15th Amendments to the United States Constitution; and
- the impact of Reconstruction policies on the South.

5.8 The student will interpret patriotic slogans and excerpts from notable speeches and documents in United States history up to 1877, including "Give me liberty or give me death," "Remember the Alamo," "E Pluribus Unum," the Gettysburg Address, the Preamble to the Constitution, and the Declaration of Independence.

5.9 The student will develop skills for historical analysis, including the ability to

- identify, analyze, and interpret primary sources (artifacts, diaries, letters, photographs, art, documents, and newspapers) and contemporary media (television, movies, and computer information systems) to better understand events and life in United States history to 1877;
- construct various time lines of American history from pre-Columbian times to 1877 highlighting landmark dates, technological changes, major political and military events, and major historical figures; and
- locate on a United States map major physical features, bodies
- of water, exploration and trade routes, the states that
- entered the union up to 1877, and identify the states that
- formed the Confederacy during the Civil War.

5.10 The student will develop skills in discussion, debate, and persuasive writing by analyzing historical situations and events, including

- different historical perspectives such as American Indians and settlers, slaves and slave holders, Patriots and Tories, Federalists and Anti-Federalists, Rebels and Yankees, Republicans and Democrats, farmers and city folks, etc.;
- different evaluations of the causes, costs, and benefits of
- major events in American history up to 1877 such as the
- American Revolution, the Constitutional Convention, the Civil
- War, Reconstruction, etc.;
- Use local and wide-area networks and modem-delivered services to access information from electronic databases; and
- Describe advantages and disadvantages of various
- computer processing, storage, retrieval, and
- transmission techniques.

United States History: 1877 to the Present

The standards for grade six relate to the history of the United States from the end of the Reconstruction period to the present day, thus completing a two-year study of American history in the elementary grades. Sixth graders should continue to learn fundamental concepts in civics, economics, and geography in the context of United States history. Teachers are encouraged to use simulations, class debates, projects, or other innovative techniques to make the students' learning experiences lively and memorable. Students should have ample instruction devoted to

reviewing and strengthening map and globe skills, skills in interpreting and using information, and historical thinking skills.

6.1 The student will explain how, following the Civil War, massive immigration, combined with the rise of big business, heavy industry, and mechanized farming transformed American life, with emphasis on

- Western settlement and changing federal policy toward the Indians;
- why various immigrant groups came to America, some of the obstacles they faced, and the important contributions they made; and
- the growth of American cities, including the impact of racial and ethnic conflict and the role of political machines.

6.2 The student will analyze and explain Americans' responses to industrialization and urbanization, with emphasis on

- muckraking literature and the rise of the Progressive Movement;
- women's suffrage and temperance movements, and their impact on society;
- child labor, working conditions, and the rise of organized labor;
- political changes at the local, state, and national levels; and
- improvements in standards of living, life expectancy, and living conditions.

6.3 The student will describe and analyze the changing role of the United States in world affairs between 1898 and 1930, with emphasis on

- the Spanish-American War;
- the Panama Canal;
- Theodore Roosevelt's "Big Stick Diplomacy;"
- the United States' role in World War I;
- the League of Nations; and
- tariff barriers to world trade.

6.4 The student will describe the ideas and events of the 1920's and 1930's, with emphasis on

- literature, music, dance, and entertainment;
- the Harlem Renaissance;
- impact of the automobile;
- prohibition, speakeasies, and bootlegging;
- the impact of women's suffrage;
- racial tensions and labor strife; and
- urban and rural electrification.

6.5 The student will explain the Great Depression and its effects, with emphasis on

- weaknesses in the economy, the collapse of financial markets in the late 1920's, and other events that triggered the Great Crash;
- the extent and depth of business failures, unemployment, and poverty;
- the New Deal and its impact on the Depression and the future role of government in the economy; and

- personalities and leaders of the period, including Will Rogers, Eleanor and Franklin Roosevelt, and Charles Lindbergh.

6.6 The student will analyze and explain the major causes, events, personalities, and effects of World War II, with emphasis on

- the rise of Fascism, Nazism, and Communism in the 1930's and 1940's and the response of Europe and the United States;
- aggression in Europe and the Pacific;
- failure of the policy of appeasement;
- the Holocaust;
- major battles of World War II and the reasons for Allied victory; and
- major changes in Eastern Europe, China, Southeast Asia, and Africa following the war.

6.7 The student will describe the economic, social, and political transformation of the United States since World War II, with emphasis on

- segregation, desegregation, and the Civil Rights Movement;
- the changing role of women in America;
- the technology revolution and its impact on communication, transportation, and new industries;
- the consumer economy and increasing global markets;
- increases in violent crime and illegal drugs;
- effects of increased immigration;
- the impact of governmental social and economic programs and the Cold War on the growth of federal income tax revenues and government spending and the role of the Federal Reserve System;
- effects of organized religious activism; and
- political leaders of the period, trends in national elections, and differences between the two major political parties.

6.8 The student will describe United States foreign policy since World War II, with emphasis on

- the Cold War and the policy of communist containment;
- confrontations with the Soviet Union in Berlin and Cuba;
- nuclear weapons and the arms race;
- McCarthyism and the fear of communist influence within the United States;
- NATO and other alliances, and our role in the United Nations;
- military conflicts in Korea, Vietnam, and the Middle East; and
- the collapse of communism in Europe and the rise of new challenges.

6.9 The student will interpret patriotic slogans and excerpts from notable speeches in United States history since 1877 including

- "Ask not what your country can do for you, . . ."
- ". . . December 7, 1941, a date which will live in infamy,"
- "I have a dream . . .," and
- "Mr. Gorbachev, tear down this wall!"

- 6.10 The student will develop skills for historical analysis, including the ability to
- identify, analyze, and interpret primary sources (artifacts, diaries, letters, photographs, art, documents, and newspapers) and contemporary media (computer information systems) and to make generalizations about events and life in United States history since 1877;
 - recognize and explain how different points of view have been influenced by nationalism, race, religion, and ethnicity;
 - distinguish fact from fiction by examining documentary sources;
 - construct various time lines of United States history since 1877 including landmark dates, technological and economic changes, social movements, military conflicts, and presidential elections; and
 - locate on a United States map all 50 states, the original 13 states, the states that formed the Confederacy, and the states which entered the Union since 1877.

6.11 The student will develop skills in discussion, debate, and persuasive writing by evaluating different assessments of the causes, costs, and benefits of major events in recent American history such as World War I, the New Deal, World War II, the Korean War, the Conservative Movement, the Civil Rights Movement, the War on Poverty, and the Vietnam War.

Civics and Economics

The standards for seventh-grade students cover the role of the citizen in the American political and economic systems. The focus is on gaining essential knowledge of the U.S. and Virginia Constitutions and the structure and functions of government institutions at the national, state, and local levels. Students also learn the basic principles, structure, and operation of the American economy. These standards are intended to foster patriotism, respect for the law, a sense of civic duty, and informed economic decision making. Social science skill development extends into quantitative data organization and interpretation.

- 7.1 The student will compare the Charters of the Virginia Company of London, the Virginia Declaration of Rights, the Virginia Statute of Religious Freedom, the Declaration of Independence, the Articles of Confederation, and the Constitutions of the United States and Virginia, as amended, with emphasis on their treatment of
- fundamental political principles including constitutionalism and limited government, rule of law, democracy and republicanism, sovereignty, consent of the governed, separation of powers, checks and balances, and federalism; and
 - fundamental liberties, rights, and values including religion, speech, press, assembly and petition, due process, equality under the law, individual worth and dignity, majority rule and minority rights, etc.
- 7.2 The student will compare the national, state, and local governments, with emphasis on
- their structures, functions, and powers;
 - the election and appointment of officials;
 - the division and sharing of powers among levels of government;

- the separation and sharing of powers within levels of government; and
- the process of amending the United States and Virginia Constitutions.

7.3 The student will compare the election process at the local, state, and national levels of government, with emphasis on

- nomination and promotion of candidates for elective office;
- similarities and differences between the major political parties;
- voter turnout;
- evaluating accuracy of campaign advertising; and
- distinguishing between reporting, analysis, and editorializing in the media, and recognition of bias.

7.4 The student will compare the policy-making process at the local, state, and national levels of government, with emphasis on

- the basic law-making process within the respective legislative bodies;
- the interaction between the chief executives and the legislative bodies;
- the functions of departments, agencies, and regulatory bodies;
- the roles of political parties at the state and national levels;
- the ways that individuals and cultural, ethnic, another interest groups can influence government policymakers; and
- the impact of the media on public opinion and policymakers.

7.5 The student will distinguish between the judicial systems established by the Virginia and United States Constitutions, with emphasis on

- the organization and jurisdiction of Virginia and United States courts;
- the exercise of the power of judicial review;
- the process of bringing and resolving criminal and civil cases in Virginia's judicial system; and
- the function and process of the juvenile justice system in Virginia.

7.6 The student will explain the structure and operation of the United States economy as compared with other economies, with emphasis on

- the basic concepts of free market, as described by Adam Smith, and of communism, as described by Karl Marx;
- the concepts of supply and demand, scarcity, choices, trade-offs, private ownership, incentives, consumer sovereignty, markets, and competition;
- private and public financial institutions;
- the economic impact of consumption, saving and investment, and borrowing by individuals, firms, and governments; and
- the differences between free market, centrally planned, and mixed economies.

7.7 The student will describe the role of governments in the United States economy, with emphasis on

- provision of public goods and services;
- protection of consumer rights, contracts, and property rights;

- the impact of government taxation, borrowing, and spending on individuals and on the production and distribution of goods and services; and
- the role of the Federal Reserve System and the impact of monetary policy on the money supply and interest rates.

7.8 The student will compare the American political and economic system to systems of other nations, including Japan, China, and leading Western European nations, in terms of governmental structures and powers;

- the degree of governmental control over the economy; and
- entrepreneurship, productivity, and standards of living.

7.9 The student will demonstrate an understanding of the rights and responsibilities of citizens in America by

- describing ways individuals participate in the political process, such as registering and voting, communicating with government officials, participating in political campaigns, serving on juries and involuntary appointed positions;
- describing and evaluating common forms of credit, savings, investments, purchases, contractual agreements, warranties, and guarantees; and
- analyzing career opportunities, in terms of individual abilities, skills, and education, and the changing supply and demand for those skills in the economy.

7.10 The student will interpret maps, tables, diagrams, charts, political cartoons, and basic indicators of economic performance (gross domestic product, consumer price index, productivity, index of leading economic indicators, etc.) for understanding of economic and political issues.

APPENDIX D

SCIENCE 8

2004 Standards of Learning

Physical Science

The Physical Science standards continue to build on skills of systematic investigation with a clear focus on variables and repeated trials. Validating conclusions using evidence and data becomes increasingly important at this level. Students will plan and conduct research involving both classroom experimentation and literature reviews from written and electronic resources. Research methods and skills highlight practical problems and questions. Students will share their work using written reports and other presentations.

The Physical Science standards stress a more in-depth understanding of the nature and structure of matter and the characteristics of energy. The standards place considerable emphasis on the technological application of physical science principles. Major areas covered by the standards include the periodic table; physical and chemical changes; nuclear reactions; temperature and heat; sound; light; electricity and magnetism; and work, force, and motion.

PS.1 The student will plan and conduct investigations in which

- length, mass, volume, density, temperature, weight, and force are accurately measured and reported using the International System of Units (SI - metric);
- triple beam and electronic balances, thermometers, metric rulers, graduated cylinders, and spring scales are used to gather data;
- data from experiments are recorded and interpreted from bar, line, and circle graphs;
- research skills are utilized using a variety of resources;
- independent and dependent variables, constants, controls, and repeated trials are identified;
- valid conclusions are made after analyzing data;
- research methods are used to investigate practical problems and questions; and
- experimental results are presented in appropriate written form.

PS.2 The student will investigate and understand the basic nature of matter. Key concepts include

- the particle theory of matter;
- elements, compounds, mixtures, acids, bases, salts, organic, inorganic, solids, liquids, and gases;
- characteristics of types of matter based on physical and chemical properties;
- physical properties (shape, density, solubility, odor, melting point, boiling point, color); and
- chemical properties (acidity, basicity, combustibility, reactivity).

PS.3 The student will investigate and understand various models of atomic structure including Bohr and Cloud (quantum) models.

PS.4 The student will investigate and understand how to use the periodic table of elements to obtain information. Key concepts include

- symbols, atomic numbers, atomic mass, chemical families, periods, valence numbers, metals, metalloids, and nonmetals; and
- binary compounds (chemical activity, physical properties, formulas, and nature of bonding).

PS.5 The student will investigate and understand changes in matter and the relationship of these changes to the Law of Conservation of Matter and Energy. Key concepts include

- physical changes (effect of temperature on state, particle size on solubility, and temperature on solubility);
- nuclear reactions (products of fusion and fission and their effects on human beings and the environment); and
- chemical changes (types of reactions, reactants and products, and balanced equations).

PS.6 The student will investigate and understand states and forms of energy and how energy is transferred and transformed. Key concepts include

- potential and kinetic energy;
- mechanical, chemical, and electrical energy; and
- heat, light, and sound.

PS.7 The student will investigate and understand temperature scales, heat, and heat transfer. Key concepts include

absolute zero, phase change, freezing point, melting

- boiling point, conduction, convection, radiation, vaporization, and condensation; and
- applications of heat transfer (heat engines, thermostats, and refrigeration).

PS.8 The student will investigate and understand characteristics of sound and technological applications of sound waves. Key concepts include

- wave length, frequency, amplitude, interference; and
- technological applications of sound.

PS.9 The student will investigate and understand the nature and technological applications of light. Key concepts include

- reflection, refraction, particle theory, wave theory; and
- electromagnetic spectrum.

PS.10 The student will investigate and understand scientific principles and technological applications of work, force, and motion. Key concepts include

- work, force, mechanical advantage, efficiency, power, horsepower, gravitational force, speed/velocity, mass/weight, Newton's three laws of motion, acceleration; and

- applications (simple machines, compound machines, powered vehicles, rockets, restraining devices, projectiles).

PS.11 The student will investigate and understand basic principles of electricity and magnetism.

Key concepts include

- static, current, circuits; and
- magnetic fields and electromagnets.

Vita

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Education

Virginia Polytechnic Institute and State University (Expected completion May 2006)

Major: Department of Curriculum and Instruction

Degree: Ed.D.

Southeastern University, Washington, DC (1979)

Major: Business and Public Administration

Degree: Master of Business and Public Administration

Frostburg State University, Maryland (1976)

Major: Political Science

Degree: Bachelor of Science

Professional Employment

Current: Principal – Hughes Middle School (Fairfax County Public Schools), International Baccalaureate Middle Years Program School, Grades 7- 8, 2001 – Present.

Previous: Assistant Principal – Annandale High School (FCPS), International Baccalaureate Diploma Program School, 1999-2001.

Principal – Area II Summer Middle School (FCPS) , Grades 6-8, Summer 1999.

Assistant Principal – Holmes Middle School (FCPS), Grades 7-8, 1997-1999.

Teacher – Social Studies Subjects - Grades 7-8, 1984 – 1997.

Coordinator, Inner City Tutorial Program, Washington, DC, 1984-1996.

Assistant to the Director, Pre-College Outreach and Planning, Gallaudet University, Model Secondary School for the Deaf (MSSD), Washington, DC, 1982-1984.

Contract Administrator, Sterling Systems, Inc. McLean, VA, 1981-1982.

Research Specialist, George Mason University, Fairfax, VA, 1976-1977.

Job Coach – Office of Personnel, Prince George County Government, MD, 1976.

Administrative Aide, Maryland General Assembly, Annapolis, MD, 1976.

Licensure

VA State Department of Education:

Administration and Supervision – PreK-12

Secondary Education (History and Social Science, Government, and Business)

Gifted and Talented

Professional Affiliations

Association for Supervision and Curriculum Development (ASCD); Fairfax Alliance of Black School Educators (FABSE); National Association of Secondary School Principals (NASPP); National Middle School Association (NMSA); Phi Delta Kappa (PDK); Middle School Principals Association (MSPA).

Professional Development and Training

StrengthsFinder, Gallup Organization; Center for Creative Leadership, (CCL); Understanding Poverty, Aha! Process, Inc.; Coaching and Mentoring, Standby Systems II, Inc.; Powerful Conversations, Linkage, Inc.; Case Study Analysis, CaseNex/University of Virginia; Instructional Development, Institute for Educational Leadership; What Works in Schools, Association for Curriculum and Development (MCREL); Participant, Janet Allen Literary Institute; Participant, Assistant Principal Leadership Institute (FCPS); School Site Evaluator, Center for Evidence-based Education (CEBE); Participant, Council of Chief State School Officers (CCSSO); Selection Committee, Virginia Schools to Watch.

Leadership

Current: Implemented International Baccalaureate Middle Years Program, Hughes Middle School; Chair, FCPS Middle School Principals Technology Committee; Member, FCPS Gifted and Talented Advisory Committee; Supervision/Mentor, FCPS Administrative Interns; Supervision, student teachers, George Washington University, George Mason University, and Marymount University; Mentor, Aspiring Principal Program (FCPS); Board Member, FCPS Middle School Girls Conference; Co-chair Research Committee, Fairfax Alliance Black School Educators (FABSE)..

Former: Implemented International Baccalaureate Diploma Program, Annandale High School (FCPS); Teacher Recruiter FCPS; Panelist, Summer Principal Academy; Educational Consultant, The American Institute for Research, National Board for Professional Standards Social Studies-History Assessment Development Laboratory; Area II Superintendent appointment, FCPS Middle School Implementation and Advisory Task Force; Educational Consultant, Smithsonian Institute “Science in American Life Since 1876” exhibit. Member, FCPS Safety and Security Task Force, Member, FCPS Professional Library Task Force; Member, FCPS Social Studies Task Force; Reader, Virginia SOLs – History and the Social Sciences; Member, FCPS Social Studies Curriculum Advisory Committee; Middle School Team Leader

Presentations/Workshops/Seminar Topics Synopsis

Leadership, Literacy and Literacy Team, VMSA 2006; FCPS Office of Staff Development and Training 2004, 2005, *Teambuilding*; Creating and Implementing Model Middle Schools;

Building Communications Skills; Diversity Appreciation and Management; Minority Student Achievement; Developing Leadership Skills; Effective Organizational Change; Gender and Ethnic Equity; Girls and Mathematics Achievement; School/Business Partnerships; School/University Partnerships; Standards Based Classrooms; Teaching Diverse Learners; Effective Teaching; Performance Assessment; Interdisciplinary Instruction; Multiple Intelligences; Differentiated Instruction; and, Brain Based Strategies; Panelist representing FCPS, the topic – “The Constitution, a Living Document,” 1987.

Conferences/Convention Presentations/Participation

ASCD Annual Conferences - 2002, 2003, 2004,2005; NASSP - 2001; NMSA Conferences; International Baccalaureate North America (IBNA) Regional Conference 1999, 2000, 2001, 2002, 2003, 2004, 2005; Assistant Principal Leadership Academy 1998-1999; Supporting the Mission 1997-1998; LEAD Fairfax speaker, Teacher Evaluation Process (2001-2006); Trained, A World of Difference: A Prejudice Reduction Program; Leadership and Ethics Conference, Oxford University, England (2002); International Baccalaureate Administrator Training, Colorado (2002) and San Juan, Costa Rica (2001).

Honors and Awards Summary

Successfully completed, Assistant Principal II, AP Portfolio process; Featured video, ASCD, Working the Limited Language Proficient Students; President and Vice President, State Board, VA Council for the Social Studies; Panelist, FCPS New Teacher Orientation (1996); Recipient, Area III Golden Eagle Award (1996); Recipient, Rocky Run Middle School Human Relations Award (1995); Featured Channel 21, School Scene Profile, “Doing History” (1996); Featured, ASCD video highlighting strategies for new teacher orientation, 1998; Co-authored, 21st Century Grant, Department of Education, Washington, DC; Co-author, Curriculum Guide– College Partnership Middle School Program (FCPS) Published article – National School Board Journal, Spring 1991; Kiwanis Club Teacher of the Year, featured article – FCPS Apple Magazine 1990; Recipient, School Board recognition, Volunteer, School Community Relations, 1992; Recognition, Cued Speech Association of Fairfax 1984.