# An Educational Evaluation of the International Baccalaureate Middle Years Program 

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by
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by

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has been approved at the
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My goal in coming to Fuller was to embark on a journey of personal and professional discovery. I surprised myself when one-third along the way, I made the necessary choice to follow (or return to) my heart and travel off the beaten path. I acknowledge with love and gratitude those guides and companions I have encountered along my way, who continue to journey with me joined in friendship, family, and Spirit.

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# Running head: INTERNATIONAL BACCALAUREATE MIDDLE YEARS 

## PROGRAM

An Educational Evaluation of the International Baccalaureate Middle Years Program<br>Amy B. Willcoxon<br>Graduate School of Psychology<br>Fuller Theological Seminary


#### Abstract

Public schools have been seeking innovative educational programs to raise academic standards and achievement. The International Baccalaureate Middle Years Program (IBMYP) was implemented at a middle school in Southern California with the objective to better meet student needs and improve academic performance. Using California Standards Tests (CSTs), academic achievements in mathematics and English-language arts were evaluated for students who had received two years of the IBMYP. Compared with students in the same district receiving standard educational curriculum, IBMYP students showed significantly greater improvement in Mathematics and EnglishLanguage Arts. This finding is consistent with the literature that innovative, comprehensive school programs with rigorous standards appear to be more effective than conventional education in meeting the academic needs of public school students.


An Educational Evaluation of the International Baccalaureate Middle Years Program

In 1983, the National Commission on Excellence in Education declared the Unites States "A Nation at Risk" due to declining academic standards and increasing student failure and drop-out rates (A Nation At Risk, 1983). According to their assessment of American public schools at the time, "the educational foundations of our society is being eroded by an arising tide of mediocrity" (A Nation At Risk, 1983, para. 1). Today, according to the Center for Education Reform (CER; 1998), the United States remains an advanced nation in terms of economic prosperity and technological progression. However, academic standards in American public schools remain inadequate, particularly in today's internationally-growing market economy. For example, compared to other industrialized nations, academic scores of American students remain low for both math and science. Further, since 1983 , more than 10 million Americans have reached the $12^{\text {th }}$ grade without being able to read at a basic level, and over 20 million were unable to do basic math. Even more alarming, more than 6 million Americans dropped out of high school altogether. In spite of some significant gains in response to the report, large numbers of students remain at risk for remaining economically disadvantaged today. "Intellectually and morally, America's educational system is failing far too many people" (CER, 1998, para. 6).

The CER further explores the implications of this general decline in academic standards, stating that American schools and families are facing a widening and unacceptable chasm between "good" schools and "bad" schools, between those students who receive an adequate education and those who come out of school ill-prepared for the
vocational and social demands of life, especially in today's increasingly global market. This has significant ramifications for ethnic and racial equality in the United States' educational systems, given that the numbers for academic underachievement and dropouts are proportionately higher for American minorities, particularly Latinos and African Americans. Poor and minority children in America tend to go to schools with comparatively poorer academic standards, have less expected of them by school and district administrators, are taught by less knowledgeable teachers, and lastly, due in part to these educational shortcomings, they have the least power to alter their situation.

There is compelling evidence that American educational standards in the public schools have fallen short in terms of preparing students from diverse social, ethnic, and economic backgrounds for life and work in today's global market economy. Patterson (2003) highlights the opinions of several teachers, families, school administrators, and community leaders, declaring that "for too long we have been boxed in by an approach to education that does not meet [diverse] students' needs" (p. 569). In response, the CER (1998) has proposed three renewal strategies to improve the status and over-all health of American public schools. First, as already indicated, students and school districts need higher levels of academic standards, assessments, and accountability. Second, public schools must be open to alternatives in the delivery of education, as the faces and needs of the American public have changed. Third, both of the above strategies require the involvement of the entire community being served, including students, teachers, parents, administrators, and neighbors.

In the last 25 years across the United States, there has been increased concern among politicians and administrators over the academic performance and needs of
"disadvantaged students" who have fewer available resources and tend to rank at the low end of the educational curve. As a result, there have been several attempts to bring these students in to the mainstream and to raise standardized testing scores in public schools (Goldberg, 2001). At first, remedial programs were thought to be the answer and were developed specifically for disadvantaged students and others with "special needs." However, studies of these programs have shown that remediation actually slows down progress, placing students even farther behind the mainstream, widening the gap even more. Until very recently, schools have embraced strategies that actually contribute to reduced expectations and stigmatization of at-risk students (Levin \& Hopfenberg, 1991).

According to Levin and Hopfenberg (1991), more and more schools are now realizing that remediation is not the solution to getting disadvantaged students caught up with their more advantaged peers. Instead, they are beginning to look at alternative programs with a different philosophy that applies to the "whole" school and not just a selected demographic of students. In 1998, school-wide approaches to improving student achievement got a boost from the federal government, when Congress enacted the Comprehensive School Reform Demonstration Program, which provides grants that encourage schools to try out comprehensive improvement models. Now, according to Viadero (2002a), researchers estimate that thousands of schools across the country are using such approaches, which include many popular "off-the-shelf" programs that have been developed in response to the general decline of American public schools.

Levin and Hopfenberg (1991) have documented several schools which serve predominantly at-risk students-ethnic minority, low socio-economic status, inner-citywho have shown dramatic improvement in both student achievement and parental
involvement by adopting the Accelerated Schools Project. Their goal is to bring at-risk students up to speed, challenging them to learn at an even faster rate than more privileged students. Educators originally reserved such acceleration programs for "gifted" students. However, studies have indicated that acceleration works just as well for at-risk students, and educators and researchers alike now contend that high academic standards and achievement should be the goal for all students, with the whole school being emphasized. In other words, all students should be regarded as more capable of achieving higher academic standards than that which has been previously expected of them.

Accelerated Schools is one example of a school improvement program designed to bring challenging curricula to disadvantaged students, and appears to have paid off for several schools that have tried it (Viadero, 2002b). However, research is showing that such comprehensive programs need a stable period of implementation before significant changes can be measured. According to one independent study, students began to accumulate significant gains four to five years into the Accelerated Schools program. According to researchers, as summed up by Viadero, "these findings demonstrate the potential of the Accelerated Schools approach, as it was implemented early in its development, to improve student achievement long-term" (p. 7). The improvements, which tended to be greatest among the middle-performing students, were about as big as those that other researchers have found in experiments gauging the effects of teaching children in smaller classes. This should be of particular interest to public schools struggling with budgeting cuts and ever growing numbers of students per classroom.

The state of California has appeared to follow the national trend of general disapproval of the public school system and the widening gap between the "educational
haves" and "have-nots." According to Johnston (1998), Californians are continuing to lose confidence in their public schools, and those who can afford it are opting for private schools which guarantee the kind of academic standards and well-rounded curriculum that American universities and employers are looking for. In a state survey conducted in 1998 , more than $60 \%$ of Californians agreed that the public school system needed a "major overhaul," while only $6 \%$ felt that public schools provided a "quality education." Kohn (2001) goes even further, stating that public schools today are "regarded with contempt" in certain social circles for not coming close to meeting the academic standards of many families. As a result, privatization has become the preferred method of reform for those who can afford it. Barlow (2003) further confirms this, citing a significant increase in the number of charter schools in recent years and the decline of enrollment of non-minority students in the California public school system.

In response to growing concerns of California citizens and faltering academic performance in public schools, the California State Board of Education (2005) sought to redefine the state's role in public education and developed content standards that specify what all California children are expected to know and be able to learn at their respective grade levels. Although there had been considerable reform efforts following the 1983 report published by the National Commission on Excellence in Education, there was a lack of focus on rigorous academic content standards. The desire to improve student achievement had stimulated infrastructural improvements, but the effort lacked a comprehensive, specific vision of what students needed to know and be able to do. Content standards for primary school subjects state explicitly the content that students need to acquire at each grade level from kindergarten to grade 12. These standards were
set forth to guide schools in what to teach, not how to teach it. To help students achieve at high levels, local schools and teachers were encouraged to take these standards and design the specific curricular and instructional strategies that best deliver the content to their students.

Since the implementation of the California Content Standards, literature has suggested that there are factors, other than specific content, that are essential for administering a comprehensive improvement program in schools. Levin and Hopfenberg (1991) and Goldberg (2001) emphasize the importance of a collective unity of purpose for "powerful learning" among the entire school community in raising academic performance, contending that standardized test scores go up as a natural by-product. Indeed, this assertion appears to be empirically supported. According to Viadero (2002a), a team of Johns Hopkins University researchers, looking at studies on nearly 30 popular school-wide improvement programs, have empirically confirmed that the comprehensive models are better than the status quo when it comes to raising student achievement. Students in schools taking part in such innovative programs performed better than $55 \%$ of their counterparts in nonparticipating schools, showing superiority over more conventional approaches. Therefore, it is not necessarily content, per se, but rather the effective implementation of a comprehensive, innovative program.

The Hopkins reviewers (as cited in Viadero, 2002a) found that the comprehensive improvement programs had common underpinnings that largely accounted for their success. First, social and emotional needs were emphasized as well as the academic needs of students, providing a more holistic approach to student education. Second, results were stronger the longer a program had been in place. Finally, as indicated above, there was no
evidence linking particular elements of school-wide programs, such as whether they require specific pedagogical practices or curricular materials, to improved academic performance by students. Therefore, it appears that consensus around a sound theory of learning and unity of purpose among students, families, teachers, and administrators are powerful tools for raising academic standards and addressing rising concerns about the state of public schools in America.

## The International Baccalaureate Program

An innovative, comprehensive school program that has been receiving attention from American private and public schools alike is the International Baccalaureate Program (IBP). As with other accelerated programs, public schools began to gravitate towards the IBP as a "test bed for innovation" with the intention of meeting more students' needs and raising academic standards. The International Baccalaureate Organization (IBO) is a nonprofit educational foundation based in Geneva Switzerland, founded in 1968. It grew out of international schools' efforts in 1924 to establish a unified curriculum across different European countries, and provide students university entry credentials. These schools were motivated by an idealistic vision that emerged following World War I, in which creativity, innovation, global awareness, and intercultural tolerance were endorsed as central to educating children who are capable, resourceful, conscientious, and socially responsible. There are currently $1,425 \mathrm{IBO}$ authorized schools in 115 countries. The IBO provides curriculum and assessment development, teacher training and information seminars, electronic networking, and other educational services to these schools (International Baccalaureate Organization, 2003).

The $\mathbb{I B O}$ is not only interested in developing innovative, creative minds that effectively seek and incorporate knowledge, but is also "keenly interested in the development of ethics and values in young people" (International Baccalaureate Organization, 2002a, p. 3). While it does not prescribe or endorse a particular moral code for any one group, it is concerned that students develop a "personal value system" by which to govern their own life decisions and actions as thoughtful and conscientious members of their local and global communities. Further, the IBO believes that its focus on intercultural awareness and building global awareness also enhances student performance in terms of nurturing in students a thoughtful, creative, and holistic approach to learning. The mission statement of the International Baccalaureate Organization is as follows:

Through comprehensive and balanced curricula coupled with challenging assignments, the International Baccalaureate Organization aims to assist schools in their endeavors to develop the individual talents of young people and teach them to relate the experience of the classroom to the realities of the work outside. Beyond intellectual rigor and high academic standards, strong emphasis is placed on the ideals of international understanding and responsible citizenship, to the end that IB students may become critical and compassionate thinkers, lifelong learners and informed participants in local and world affairs, conscious of the shared humanity that binds all people together while respecting the variety of cultures and attitudes that makes for the richness of life. (International Baccalaureate Organization, 2003)

The IBO offers three educational programs at both the primary and secondary levels of standard education, all of which share the same mission and aim to encourage students to pursue higher education. Schools may subscribe to any or all of the programs, none is a prerequisite for another. The Primary Years Program is for students aged 3 to 12 , and focuses on the construction of meaning, principally through concept-driven inquiry. The Middle Years Program is for students aged 11 to 16 , and seeks to provide a framework of academic challenge and life skills appropriate to this stage of adolescence. The Diploma Program is for students in the final two years of high school, and provides a rigorous pre-university course of studies that leads to examinations for entry into college. The IB Diploma is recognized by colleges and universities in every country (International Baccalaureate Organization, 2003).

According to Spahn (2001), the IBP functions not only as a tool to bolster the academic program of a school, but it is also a selling point for today's public school system that has been thrust into the competing environment of a market economy. Several of these schools have implemented the IBP not just to raise public school students' academic performance, but also to adjust the ethnic mix of their school, to create a more multicultural population by drawing in more non-minority students who have migrated to private schools with more rigorous academic programs. In addition, Spahn observes that the international aspects of the IBP are becoming more and more esteemed as schools that have adopted the program have settled into the IBO curriculum. According to George Walker, the new Director General of the IBO, "many national schools are now seeing international education as the path of the future" (as cited in Spahn, 2001, p. 117).

Poelzer and Feldhusen (1997) identify additional determining factors in American private and public schools' decisions to adopt the IBP. Specifically, schools have identified the IBP's precept for academic excellence, the challenge inherent in the syllabus, the opportunity to upgrade curriculum school-wide, international focus, and the integrated structure of studies as reasons that the IBP works for them. Further, the IBP stresses balance between literary and scientific disciplines and contains relatively more content at more abstract levels, with the intended purpose of fostering student creativity and innovation. Supporters purport that the IB philosophical underpinnings of the program encourage students to think innovatively such that several disciplines are integrated, fostering the characteristics of students who have historically been considered "gifted."

According to Gazda-Grace (2002), an IB Coordinator at a high school in Alabama, the IBP addresses national concerns about standards and accountability by providing annual "subject reports" which enable the school to see how its students perform in relation to students around the world. Teachers are also provided with suggestions in these reports as to how they can improve their curriculum and instruction. This feedback allows for teacher input and the revision of curriculum to reflect the needs of students, teachers, and changing world events. Teachers also receive rigorous training by the $\mathbb{I B O}$ and are able to network with other teachers in an on-line curriculum center for $\mathbb{I B}$ schools around the world. Based on her experience, she purports that "the $\mathbb{B}$ program really does address the concerns posited by the media, educational experts, and leaders in business and industry about standards and accountability" (p. 86).

## The IB Middle Years Program (IBMYP)

The IB Middle Years Program (IBMYP), like all the $\mathbb{I B}$ school programs, emphasizes particular characteristics in pedagogy and curriculum which "embraces yet transcends the focus on traditional school subjects" (International Baccalaureate Organization, 2002a, p. 4). Further, it is based on a framework which allows schools sufficient flexibility to take into consideration local educational requirements as well as those objectives for subjects outlined by the IBMYP. According to the International Baccalaureate Organization (2002b):

The IBMYP is designed to teach students to become independent learners who can recognize relationships between school subjects and the world outside, who can adapt to new situations and combine relevant knowledge, practical and social intelligence to solve authentic problems alone or in groups. Successful teaching of the program requires commitment to its fundamental principles on the part of the whole school community, and a high degree of communication and collaboration between teachers. (p. 4)

Three fundamental principles underpin the development and implementation of the program (International Baccalaureate Organization, 2002b). First, the IBMYP aims to accentuate the interrelatedness of diverse subject areas, encouraging a holistic view of learning. This is a constructivist, process-led view of learning in which the student discovers relationships between areas of knowledge and between the individual, communities, and the world. Second, the principle of intercultural awareness underscores the development of students' attitudes, knowledge, and skills as they learn about their own and others' cultures. This helps students to discover and affirm their own identity as
well develop tolerance and respect for others. With holistic education and intercultural awareness, the IBMYP emphasizes the importance of building communication skills, the third fundamental principle, to support inquiry, understanding, and attunement within.

According to the International Baccalaureate Organization (2002b), the IBMYP "provides a balanced and flexible curriculum framework" (p. 7) in which curriculum guides, published by the IBO for every subject, outline a framework of concepts and skills intended to provide direction to schools and ensure commonality among IB schools worldwide. These curriculum frameworks allow schools to keep within their local educational requirements as well. As part of its holistic approach to learning, the MYP requires teachers to consider their subject as part of a group within the larger curriculum framework. Teachers are encouraged to collaborate and work as a team, employing a variety of teaching methods that underscore the program's emphasis on interrelatedness. Middle schools that have received IBO accreditation must implement other necessary components of the program that distinguish it from standard educational curriculum at the middle school level. These components include the five areas of interaction, the eight core subjects, the personal project, and ongoing assessment.

Five perspectives known as the "areas of interaction" are at the core of the IB Middle Years Program, which seek to enhance students' intellectual development (International Baccalaureate Organization, 2002a). These are common perspectives embedded within each academic subject. They provide a framework for learning, connecting the subjects through these common perspectives. First, "Approaches to Learning" encourages students to take responsibility for their learning and become aware of how they develop and communicate their knowledge. Second, "Community and

Service" encourages students to ask themselves how they can make a difference and act responsibly to each other. Third, "Homo Faber" encourages students to explore the processes and products of human creativity and resourcefulness. Fourth, "Environment" encourages students to be conscientious about their surroundings and resources. Fifth, "Health and Social Education" deals with physical, social, and emotional health and intelligence, and encourages students to think about health issues as they consider life options. These areas of interaction pervade and recur through the eight subject groups, interdisciplinary teaching, whole school activities, and students' personal research projects.

The IBMYP requires schools to teach educational subjects that are organized into eight areas: Language A, Language B, Humanities, Sciences, Mathematics, Arts, Physical Education, and Technology (International Baccalaureate Organization, 2002a). Language A is the study of the English language at Wilson, and enables the student to understand and be understood as well as to gain access to literature. Language $B$ is an additional modern language and encourages the student's intercultural awareness, communication skills, and ways of thinking. Humanities in the IBMYP consist of both geography and history. The Sciences consist primarily of the traditional subjects of biology, chemistry, and physics. Mathematics should include a framework that includes the five branches of mathematics, number, algebra, geometry and trigonometry, statistics and probability, and discrete mathematics. The Arts encompasses both visual and performing arts. Physical Education aims to incorporate physical, intellectual, emotional, and social development. Technology is concerned with integrating intellectual abilities and practical skills and focuses on systems, information, and materials.

One last component of the $I B$ program that distinguishes it from other academic curriculums is its emphasis on both formative and summative assessment (International Baccalaureate Organization, 2002a). Assessment occurs at each level of the school, including the administration, teachers, and the students themselves. The IBMYP requires teachers to organize continuous assessment over the course of the program according to specific criteria that correspond to the objectives of each subject. Regular internal assessment and reporting play a major role in students' understanding of the objectives and criteria and in their preparation for final assessment by both the IBO and state and local education boards. The IBMYP offers a criterion-referenced model of assessment that teachers are responsible for implementing. Teachers are encouraged to use a variety of formative assessment methods that involve the students themselves, emphasizing teacher-led assessment, group or peer evaluation, and student self-assessment. Final assessment in the IBMYP requires teachers to make judgments based on the rigorous application of the prescribed assessment criteria defined in each subject guide.

## Educational Evaluation of the IBMYP

In 1999, a school district in the State of California adopted the $\mathbb{I B}$ program into three of its schools in conjunction with a district initiative, the Magnet Schools Assistance Program (MSAP) project. These schools included an elementary school, a middle school, and a high school, such that all three of the IB educational programs were implemented. Under the MSAP project, these schools received federal funds over three years for the implementation of an alternative program designed to raise academic standards. The IBP had been one of various accelerated programs that had been explored, and was selected primarily for its emphasis on multiculturalism, creativity, and
technology as well as for offering outside opportunities within the community. It was felt that the program would be a good fit for the school district's multicultural community, and indeed, community members responded quite favorably to the idea of bringing the $\mathbb{I B P}$ to its public schools.

The school district's objectives in implementing the IBP were focused around the following areas: (a) improvement in students' academic performance in reading and mathematics as measured by annual State-mandated assessment of skills acquisition; (b) improvement in student behavior as a result of implementation of challenging and engaging curriculum delivered using content-appropriate interactive teaching strategies; (c) development of sophisticated technology-use skills among students as a result of integration of content-specific technologies into all phases of the instructional program; (d) stabilization of the racial/ethnic and socioeconomic composition of the student population in $\mathbb{B}$ schools as a result of implementation of a rigorous and appealing academic program that would persuade many students previously planning to opt out of the public school system to reconsider their decision; and (e) increased parental satisfaction with public school instruction and services.

## Purpose

The purpose of this educational evaluation was to assess the effectiveness of the IBMYP implemented at a middle school in terms of the school district's first objective, to improve students' academic performance in reading and mathematics as measured by annual State-mandated assessment of skills acquisition. We evaluated academic performance by analysing the California Standards Test scores of students who have received two years of the $\mathbb{I B}$ curriculum at the established middle school, and comparing
these students' scores with students receiving traditional California education curriculum at a comparable middle school in the same school district. The California Standards Tests (CSTs) are criterion-referenced tests that are used by the State of California's Board of Education in its Standardized Testing and Reporting (STAR) Program (California Department of Education, 2004a). The CSTs in English-Language Arts and Mathematics were added to the STAR Program in 1999 and are comprised of items that were developed by California educators and test developers and written specifically to assess students' knowledge of California's Academic Content Standards in the general subject areas.

The California State Board of Education approved five performance levels in which students can achieve based on their individual standard scores. The performance levels are advanced, proficient, basic, below basic, or far below basic. Performance levels establish the points at which students have demonstrated sufficient knowledge and skills to be regarded as performing at a particular achievement level. The number or percent of questions that students must answer to score at each performance level may change slightly from year to year due to differences in the difficulty levels of the tests (California Department of Education, 2004a). For a breakdown of scaled score ranges for 2004 CST Performance Levels for English-Language Arts and Mathematics in sixth and eighth grades, see Table 1. The state's target is for students to score at the proficient or advanced levels, a score of "proficient" indicating that students are incorporating enough of the subject content in order to develop the skills necessary to eventually succeed in college or the workplace (Edsource, 2003). Students with significant cognitive disabilities do not take the CSTs.

As of 2002, the CSTs carry the most weight for calculating school and district Academic Performance Indexes, counting as $60 \%$ of the total API calculation. The CSTs are also used in determining adequate Yearly Progress for grades two through eight toward meeting the federal No Child Left Behind requirement to have all students score "proficient" or above by 2014 (Edsource, 2003). CSTs for English-Language Arts and Mathematics and were used for the purposes of this educational evaluation. We predicted that the more rigorous standards and comprehensive, integrative approach of the International Baccalaureate program would yield a greater overall improvement in students' CST scores in English-Language Arts and Mathematics compared to standard education curriculum in the state of California.

## Method

## Participants

Participants for the evaluation included 397 middle school students, 246 of which have been a part of the International Baccalaureate Middle Years Program at the same middle school beginning in sixth grade during the 2001-2002 school year. These students went on to complete the IBMYP for the seventh and eighth grade years. The students were multi-ethnic, with $55.7 \%$ Hispanic, $22.4 \%$ African American, $14.6 \%$ Caucasian, 4.5\% Asian, and 2.8\% other. Students were $49.6 \%$ male and $50.4 \%$ female. These percentages are representative of the ethnic and gender make-up of the school district in which the school is situated, each group within four or less percentage points of its correspondent for the 2003-2004 school year. Socioeconomic status was measured according to whether students qualified for free school lunches through the Federal Food Services Program. Accordingly, $61.8 \%$ of students in the $\mathbb{I B}$ group received free lunches,
while $38.2 \%$ did not. Finally, students' English proficiency was classified as follows: 44.7\% were proficient in English upon entering the sixth grade, $19.9 \%$ were English learners, and $32.9 \%$ had been reclassified from English learners to proficient in English. Students' ages ranged between 12 and 15 years. These descriptive variables of the $I B$ group and non-IB group are summed up in Table 2.

The control group comprised of 151 students who began the sixth grade during the 2001-2002 school year and completed their seventh and eighth grade years at another middle school in the same district as the IB school. These students were also multi-ethnic with 46.4\% Hispanic, 40.4\% African American, 11.9\% Caucasian, 1.3\% Asian, and 0\% other. These students are $49 \%$ male and $51 \%$ female. These ethnic percentages differ somewhat from the make-up of the school district, with $7.7 \%$ fewer Hispanic students and $14.4 \%$ more African American students. The percentages for other ethnic groups and for gender fall within four points of its district correspondent. Students who received free school lunches were $62.3 \%$ of the non-IB group, while $37.7 \%$ of these students did not receive free lunches. Finally, students' English proficiency in the non-IB group was classified as follows: $58.3 \%$ were proficient in English upon entering the sixth grade, $15.2 \%$ were English learners, and $21.9 \%$ had been reclassified from English learners to proficient in English. Students' ages ranged between 13 and 15 years.

## Measures

California Standards Tests. The California Standards Tests (CSTs) are used by the State of California's Board of Education in its Standardized Testing and Reporting (STAR) program (Califomia Department of Education, 2004b). According to Mark Hansen of the Educational Testing Service (personal communication, 2004), which is
contracted to administer the CSTs, the CST reliability index is "generally in the low .90 s." Test validity is assessed at the local level rather than the state level because it is difficult to find a consistently applied criterion across school districts. Although the school district in which the schools in this study reside does not have specific information on CST validity for their students, confining analyses within a unified school district greatly increases test validity.

According to the California Department of Education (2004b), CSTs for sixth and eighth grade levels in English Language Arts are all multiple-choice and consist of 75 questions. CSTs for sixth and eighth grade levels in Mathematics are all multiple-choice and consist of 65 regular test items with six embedded field test items, bringing the total number of items on each test to 71. The CSTs for Mathematics are written to specifically assess California grade-level standards in grade six, and general and specific mathematics disciplines, such as Algebra I or Geometry, in grade eight. The General Mathematics Standards Test is given to students in grade eight who are not enrolled in a standardsbased math course or are in the first year of a two-year Algebra I course. The General Mathematics Standards Test is based on sixth and seventh grade mathematical standards as outlined by the California Department of Education (2004b). For a breakdown of the CST English Language Arts test contents for sixth and eighth grades see Table 1, and for Mathematics test contents for sixth and eighth grades, see Table 2. CSTs for all grades and subjects are not timed.

Scaled scores are used to evaluate overall student performance. Scaled scores provide a more precise measure of performance than raw scores and are used to equate the tests at each grade level from year to year. The equating is used to ensure that
differences in the difficulty levels of the CSTs from year to year do not affect scaled score ranges and grade-based mean performance levels. The ranges of possible scaled scores for the CSTs are 150 to 600 for each grade and subject. In addition to scaled scores, performance levels are used to compare student performance across schools. For all CST content areas and grades, the proficient level is set at a minimum scaled score of 350 , and the basic level is set at a minimum scaled score of 300 . For a breakdown of the Performance Levels for English-Language Arts and Mathematics in grades six and eight, see Table 3 (California Department of Education, 2004b).

STAR regulations state that all students must be tested within a 21 day window that is comprised of the 10 days before and the 10 days after the day on which $85 \%$ of the year's instructional days are completed. All students, including English learners and students with learning disabilities are required to take the California Standards Tests as part of the STAR program, although accommodations are provided to ensure fair comparability of test scores for these students. Test Coordinators at each school are given strict, standardized security measures and administration guidelines to follow to ensure test reliability and validity across California public and private schools. Testing problems or errors are reported as well so they can be adequately addressed and accounted for. Once testing has been completed, students' answer forms are sent to the designated STAR Scoring and Processing Center where they are scored and interpretive reports are constructed (California Department of Education, 2004a).

## Procedures

The following data were retrieved from Pasadena Unified School District computer records for all students at both the IB school and non-IB school who completed
the sixth through the eighth grades and who took the California Standards Tests. Sixth grade, Spring 2002 and eighth grade, Spring 2004 Califormia Standards Test scaled scores and performance levels of the Class of 2008 were retrieved. English-Language Arts and Mathematics scores were retrieved for both grades. Because eighth grade students took different math tests depending on their readiness level, i.e. General Mathematics or Algebra I, performance levels for students who took the General Mathematics Test were adjusted to equate comparison with students who took the Algebra I Test. In accordance with the standards and procedures of the State's Academic Performance Index, the General Mathematics performance levels were dropped one level (Linda Lownes, personal communication, 2005).

General demographic information for students, including ethnicity, gender, age, socio-economic status, primary language, and English language proficiency were included as well. Socioeconomic status was determined by whether students applied for and qualified to receive free or reduced-price school lunches as determined by the number of family members and total household income. English language proficiency is coded according to whether the student came into the school district as already proficient in English, learning the English language, or the student has been reclassified from a learner to proficient during the course of their education. Student names were not included in the data, and students were identified by school identification numbers only, which were coded by the experimenters to increase confidentiality.

## Analyses and Results

The research design, a pretest-posttest control group design, used school as the primary independent variable. The dependent variables were the pretest and posttest
achievement scores as measured by the CSTs in English-Language Arts, and the pretest and posttest performance levels as measured by the CSTs in Mathematics. If the IB program did produce an impact on students' scores, we expected a statistical interaction between the schools and the outcome measures, i.e., the CST posttest scores for EnglishLanguage Arts and the performance levels for Mathematics. Because the study focused on interaction effects and main effects involving both $\mathbb{I B}$ and non-IB students, an analysis of covariance was performed on the data. Unimult, a statistical program that runs univariate and multivariate analyses (Gorsuch, 1991), was used to process the data. Alpha was set at .05 for tests of significance.

We ran preliminary analyses in order to test program effects on the different demographic groups. There were no significant effects for the variables of age and primary language for both English-Language Arts and Mathematics. Therefore, these demographic variables were dropped from the remaining analyses. Analyses were then run to test whether schools were significantly different in terms of the demographic variables of ethnicity, gender, primary language, age, socioeconomic status, and English proficiency. The demographic make-up of each school is presented in Table 4. Results are reported in Table 5. There were significant differences between schools in English proficiency at the pretest, $R=.16, C h i S q=9.96, p=.02$, and ethnicity, $R=.18$, Chi $S q=$ $13.07, p=.02$. There were no significant differences in socioeconomic status, gender, age, and primary language spoken.

In order to strengthen the internal validity of the main effects, we also tested for interactions between all demographic variables and the schools, using an over-all set test. The set test of all the interactions for English Language Arts is presented in Table 6 and
for Mathematics in Table 7. The interaction of demographic variables was not significant for the Mathematics posttest, suggesting that the different school programs impacted students regardless of demographic variability. The interaction was just barely significant for the English Language Arts posttest, $F(54,330)=15.11, p=.03$. However, tests within the set that were significant involved such small groups (e.g., $N=7$ ) that generalization to other samples is questionable. Differences in demographic variables among students' CST scores were not further explored as the purpose of this project is to identify the effect of the IB program on students' scores. Demographic variability between schools was statistically corrected for by partialling so that the program effects applied equally for all demographic variables.

Next, we ran a hierarchical linear analysis to test whether there were significant differences in pre-test scores between schools. The results for English Language Arts pretests are shown in Table 8 and Mathematics in Table 9. Partialling out the effects of demographic variables, there were no significant differences in pre-test scores between the two schools for both English Language Arts and Mathematics.

Analyses were then run to test whether schools differed significantly in the difficulty level of eighth grade CST Mathematics tests that students took. The eighth grade Mathematics tests taken in each school is presented in Table 10. Results are reported in Table 11. There was a significant difference in difficulty level of Mathematics tests taken between the schools, $R=.53$, Chi $S q=226.38, p<.0001$, with significantly more students in the IB school taking the more advanced Algebra I test. We then tested for differences in test scores for students who took the Algebra I test between the two schools. There was no significant difference in Algebra I test scores between the IB and
non-IB program. The sample size for students taking the less difficult General Math test was too small in the IB program to test for significance $(N=9)$.

To test for differences after two years of the IB program, our primary hypothesis, we used pre-test scores (English-Language Arts) or performance levels (Mathematics) and demographic variables as co-variates so that the schools are equated on these variables. This allows us to control for threats to the internal validity of the program effects (Dugard \& Todman, 1995). Results for English Language Arts are shown in Table 12 and Mathematics in Table 13. There was a significant difference between schools for both English Language Arts $F(1,384)=6.66, p=.01$, and Mathematics, $F(1,384)=$ 8.18, $p<.01$.

Pretest and posttest means, standard deviations and the effect sizes $(d)$ in pretests and posttests for English Language Arts are reported in Table 14. The second set of means is corrected for demographic variables and the pre-test. The effect size was .12 in the IB school, and .06 in the non-IB school. English-Language Arts posttest scores and Mathematics posttest performance levels, standard deviations, and the effect sizes ( $d$ ) in posttests for the two schools are reported in Table 15. The effect size was .27 between the two schools for English-Language Arts, and .23 for Mathematics. The $d$ for EnglishLanguage Arts and Mathematics suggested that students in the IB school improved in both subjects beyond those in the non-IB school.

Discussion

As predicted, students who received the International Baccalaureate Middle Years Program showed greater improvement in their California Standards Tests scores in English-Language Arts and Mathematics than students receiving traditional educational
curriculum in the same school district. Further, it appears that the IBMYP better prepared its students for higher level math, as significantly more students in the $\mathbb{I B}$ school took the Algebra I CST in eighth grade than students in the non- $-\mathbb{B}$ school, who predominantly took the General Math CST. Analyses of the performance levels in Mathematics suggests that students taking the Algebra I Test achieved higher levels of learning as measured by the CSTs than students taking the General Math Test. Further, with more students taking Algebra I, the IB school appears to be encouraging earlier entry into high school math for students, which is predictive of other college preparatory mathematics classes during students' high school years.

The findings of this study are consistent with the educational literature that innovative, comprehensive school programs with rigorous academic standards and a communally-shared purpose are more effective in raising student achievement than conventional education curriculum (Goldberg, 2001; Levin \& Hopfenberg, 1991). Further, these findings provide evidence that academic programs like the International Baccalaureate are effective in meeting the academic needs of students from diverse social, ethnic, and economic backgrounds who largely make up today's public schools (Patterson, 2003). These findings lend additional support to educators and families who have expressed dissatisfaction with the current state of affairs in public schools and have been advocating for reform or better access to private school programs. This study appears to be one more link in the chain supporting educators and researchers advocating for a shift in American public education from more conventional educational practices to a holistic approach that both involves the whole school community and emphasizes high standards for academic and social conduct.

We included in our analyses several demographic variables of the students at the IB and non-IB schools, including, age, gender, ethnicity, primary language, socioeconomic status, and English proficiency. In our preliminary analyses, the variables of age and primary spoken language were determined to not have a significant effect on academic achievement, and so were dropped from the remaining analyses. However, it was clear that ethnicity, gender, socioeconomic status, and English proficiency were significant in effecting students' academic achievement, particularly in English-Language Arts (see Table 4). Demographic variability between schools was corrected for so that the effects of the IBMYP applied equally for all students. Differences in demographic variables among students' CST scores were not further explored here as the purpose of this project was to identify the effect of the IB program on students' scores. However, in order to best take into account how to educationally serve today's diverse student population, we recommend that these differences be investigated further in future research.

We should take into consideration other factors that may have influenced our results, which were not statistically analyzed in this study. Two areas that could have also impacted differences student achievement between the two schools were class size and teacher experience. On average, the $\mathbb{I B}$ school did have a smaller, school-wide average class size during the 2002-2003 school year. During this year, the average class size for the IB school was 31, while for the non-IB school it was 33. Both schools had the same pupil-to-teacher ratio, however, of 23:1. Upon closer examination, it appears that the class sizes for English and mathematics during the three middle school years at the IB school were somewhat smaller than the non-IB school for the 2002-2003 school year. An
additional factor that should be considered in analyzing student achievement is the experience of teachers. There was, however, no over-all difference between the $\mathbb{I B}$ and non-IB schools in teacher experience for all subjects during the 2002-2003 school year, with an average of 11.9 years of experience for teachers at both schools.

Another factor that may have influenced student achievement that was not explored here is student attendance rates. Although they were not statistically examined in this study, it appears that the $\mathbb{I B}$ school had slightly better attendance rates than the non-IB school for the 2002-2003 school year. For the IB school, the average attendance rate for students was $97.49 \%$, while for the non-IB it was $94.09 \%$, a difference of $3.4 \%$. It also appears that the non-IB school had a higher incidence of student suspensions than the IB school. The average suspension rate for the non-IB school for the 2002-2003 school year was $51.53 \%$, while it was $33.77 \%$ for the IB school, a difference of $17.76 \%$. It is important to note that we are unable to speculate at this time whether these differences in student attendance and suspension rates are a cause or result of educational program differences between the $\operatorname{IB}$ school and non-IB school. However, they are important indicators of the emotional climate of students' learning environments and should be investigated further.

An additional variable that is important to student academic achievement and should be explored further is parental involvement in their children's education. The IBMYP was implemented only after the school community indicated a favorable response to the program. Therefore, it is likely that school publicity and community meetings got parents excited about the program from its inception, and that parents were therefore more invested in their children's schooling and homework assignments. The

IBO seeks to involve the whole community in students' learning experience, and curriculum encourages students to explore their cultural and familial influences on their identities and learning styles (International Baccalaureate Organization, 2002b). This emphasis on family and cultural background may also impact parental involvement. Finally, a major goal of the school district's initiative in implementing the IBP into its schools was to attract students who would otherwise seek a rigorous academic program at a private school. Therefore, it is likely that many parents, having the option to choose among schools in this particular school district, selected the IBMYP for their children and so were more involved in their children's educational life from before beginning the program.

Finally, a factor that likely had a significant impact on academic achievement in the IBMYP and should receive further attention was the support and morale of the administration, staff, and teachers at the school. According to Rich Boccia (personal communication, 2003), the principal who spearheaded the IBMYP implementation, the majority of the school's administration and teachers showed a favorable response and were directly involved in selecting and implementing the program. A few teachers who did not support the program left to teach at other schools. Therefore, it appears that the predominance of school administrators and teachers supported the IBMYP, and their backing plausibly created a social and educational environment conducive to student learning and performance. The IBO espouses itself as an idealistic program (Intemational Baccalaureate Organization, 2003), with values which may be more in harmony with teachers' objectives for entering the profession than standard educational curriculum inspires. Research dating back to the 1920s supports such factors as employees' attitudes
toward their jobs and open collaboration between employees and administrators that influence motivation, productivity, and satisfaction in various working environments (Schultz \& Schultz, 1992). This appears to be the case for this IB school, where enthusiasm for the program was apparent by the whole school's community being involved in the selection and implementation of the program.

The above variables clearly need to be investigated as likely contributors to the outcome of this study. However, equal consideration should be given to the synchronicity of the IBMYP philosophy with the recommendations from educators and researchers alike to improve student achievement in schools. Major characteristics of the IBMYP in this study are consistent with all the renewal strategies proposed by the Center for Educational Reform (1998) to improve the academic health of American public schools. First of all, this finding supports their assertions that higher levels of academic standards, assessments, and accountability will help improve student achievement. Rigorous academic standards are built into the IBMYP philosophy and curriculum for each subject area (International Baccalaureate Organization, 2002b). Further, in order for a school to be endorsed by the IBO , it must agree to and implement all of the levels of assessmentat the student, teacher, and school levels-proposed by the organization in order to ensure that its standards are being met. Additional assessment options are also made available to $\mathbb{I B}$ schools by the organization, and are highly encouraged as part of the annual reports that make comparisons among IB schools across the globe.

The second recommendation of the Center for Education Reform (1998) was that public schools become open to alternative forms in the delivery of education, especially as American students and their needs have changed and will continue to do so. The

IBMYP provides such an alternative framework with its emphases on the interrelatedness of subject areas, the personal development of learning paradigms by students themselves, and a focus on intercultural and global awareness (International Baccalaureate Organization, 2002b). It is difficult to say if one or all of these had more or less of an effect on student achievement, and should be further explored in future evaluations. It is likely that all had some effect insofar as they were encompassed in a unified vision provided by the IBO for all school staff and administration, and most especially for teachers. According to the International Baccalaureate Organization (2002b), teachers receive training seminars and use IBMYP curriculum guides which incorporate the above emphases into their classroom discourse, which then affects students directly.

The third recommendation by the Center for Education Reform (1998) was that the alternative framework and higher academic standards within it involve the entire community being served, including students, teachers, parents, administrators, and neighbors. In its literature and philosophy, the IBO is rather clear in its aims to include the entire educational community being served in upholding its standards and assessment procedures. In the case of this particular IB school, the community response to the program was the final deciding factor in bringing it to this particular school district (Rich Boccia, personal communication, 2003). The IBMYP started off with the advantage of the endorsement of the school community. All school personnel, including teachers, administrators, and supportive staff, were provided with a clear vision for its students by the IBO. Further, teachers are encouraged to work in conjunction with one another in order to emphasize the interrelatedness of subject material, such that a more communal
approach is incorporated into the program structure and pedagogy itself (International Baccalaureate Organization, 2002b).

In addition to providing support for the recommendations of the Center for Education Reform, this evaluation supports the findings of Levin and Hopfenberg (1991) with the Accelerated Schools Project, that all students, including those considered at-risk, are capable of achieving higher academic standards than that which has been expected of them in standard public school curricula. However, this study also suggests, along with other literature, that higher standards in and of themselves are not enough (Goldberg, 2001; Levin \& Hopfenberg, 1991). The California Content Standards were implemented to raise academic standards in California's schools by providing specific guidelines of what students should know. Schools were given the standards and encouraged to design their instructional curriculum in order to best deliver the content to students (California State Board of Education, 2005). The findings of this evaluation suggest that the way that content standards are imparted to students through program structure and pedagogy is what makes the difference in student achievement. Both the IB school and the non-IB school were given the Califormia Content Standards to guide their curriculum; however, the IB school was more effective in imparting learning of these standards as measured by the CSTs.

Levin and Hopfenberg (1999) and Goldberg (2001) suggest that the collective unity of purpose for "powerful learning" among the entire school community makes the difference in raising academic performance, contending that standardized test scores go up as a natural by-product. This appears to be true for the IB school in this study, suggesting that the school staff have been successful in effectively implementing an
innovative, comprehensive program with the support of the community at large (Viadero, 2002a). Assuming that the school delivered an educational program that actually matches the IBMYP literature and philosophy, we should also consider whether particular principles of the IBMYP itself or the effective implementation of an alternative program applied to the whole school made the real difference in raising student achievement levels.

It is probably a combination of the successful implementation of a comprehensive program and the program itself that helped raise student achievement scores in this study. One of the IBO's primary philosophical underpinnings is a holistic approach to learning (International Baccalaureate Organization, 2002b). The ethic of teaching the "whole student," including his or her social, emotional, and physical development, is implied in the IBO's approach to education in which the interrelatedness of different subjects such as humanities, mathematics, physical education, and technology is emphasized. Further, social, emotional, and physical aspects of development are specifically identified as vital to all areas of academic functioning, and are indicated in the five areas of interaction that pervade throughout all subjects and curricula. The five approaches really all have in common encouraging students go one step farther in terms of thinking conscientiously about the process of learning, acting in the world, and the implications for their knowledge and actions in the world. However, the five areas of interaction-approaches to learning, community and service, homo faber, environment, and health and social education-do have specific and distinctive emphases. It is unknown how much one area of interaction vs. another was emphasized at this IB school, and the over-all impact that
was had on student achievement. This would be interesting and valuable for future investigation.

The three fundamental principles that support the development and implementation of the IBMYP (International Baccalaureate Organization, 2002b) should also be further explored as to their impact on student achievement. First, as mentioned above, is the emphasis on the interrelatedness of diverse subject areas, encouraging a holistic view of learning. Second, the principle of intercultural awareness in terms of exploring one's own cultural background and learning about others may engage students more in learning or foster a way of thinking making connections between the individual and larger global communities. Perhaps this skill in "making connections" and thinking about the "bigger picture" somehow enhances problem-solving when it comes to taking standardized tests, for example. The third principle that the IBMYP emphasizes is building communication skills, in order to encourage inquiry, understanding, and attunement. It is quite possible that the IB's emphasis on teaching students how to ask questions about learning and become attuned communicators and listeners had a particular impact on their academic achievement. Further research should compare the $\mathbb{I B}$ program with other innovative and comprehensive school programs in order to identify what particular aspects of these programs, besides being innovative and comprehensive, are having an effect on students.

It may be something as simple as the IBMYP's endorsement of itself as a creative, innovative educational program, and that such innovation and creativity is encouraged in its teachers and students. Gifted students have long been recognized for their ability to be creative and innovative thinkers, which better helps them to grasp a
deeper understanding of material (Poelzer \& Feldhusen, 1997). Or, simpler still, there may be something about the IBMYP curriculum guides that happen to match up closely with California Content Standards. Another possibility is that the IBMYP's inclusion of personal exploration and awareness of intercultural and global issues may simply be more engaging to students who live in an increasingly diverse environment with communication links that reach the scope of the globe. If this is the case, we would then assume that students would be more motivated to attend class, to participate in classroom activities, maybe even do their homework. Still another possibility is that teachers feel clearer about their educational purpose and better taken care of by the communallyshared responsibilities emphasized by this program, and are therefore more attentive and invested in the material and in their students. There are numerous possible benefits which may be mutually impacting and have cyclical effects; however, what is clear is that this educational program appears to be making a significant difference in student achievement for the population it serves.

Since the National Commission on Excellence in Education's "A Nation at Risk" was published in 1983, contemporary sociologists and philosophers have been commenting on a great shift in the United States and other industrialized nations into "postmodern" society. Perhaps the public school system is simply needing to catch up with the rest of the world which is now largely guided by technology. It certainly appears evident, based on the educational literature, that "old school" public education is no longer relevant for today's students. The IBO's emphases on holistic approaches to learning, intercultural and global awareness, communication at multiple levels, and encouraging students to think about their learning may simply be a better match for the
values of the postmodern society we are now living in. The IBO is explicit in its intention to "transcend the focus on traditional school subjects" in its curriculum, taking what the educational world has established in the public school system, and bringing it one step closer to being applicable to and relevant in the world our students are learning in today.

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Table 1
California Standards Test Contents in English-Language Arts for $6^{\text {th }}$ and $8^{\text {th }}$ grades
Grade Test Contents Number of Questions

6
Word Analysis and Vocabulary Development 13
Reading Comprehension 17
Literary Response and Analysis 12
Written Conventions 16
Writing Strategies 17
8
Word Analysis and Vocabulary Development 9
Reading Comprehension 18
Literary Response and Analysis 15
Written Conventions 16
Writing Strategies 17
Note. Adapted from STAR CST Reporting Clusters Table in Appendix A from the
California Department of Education's 2004 California Standardized Testing and
Reporting Post-Test Guide. Retrieved January 12, 2005, from
http://www.startest.org/archive.html

Table 2
California Standards Test Contents in Mathematics for $6^{\text {th }}$ and $8^{\text {th }}$ grades
Grade Test Contents Number of Questions

6
Ratios, Proportions, Percentages, Fractions 15
Operations and Problem Solving with Fractions 10
Algebra and Functions 19
Measurement and Geometry 10
Statistics, Data Analysis, and Probability 11
8 General Math
Rational Numbers 14
Exponents, Powers, and Roots 10
Quant. Relationships and Evaluating Expressions 11
Multi-step Problems, Graphing, and Functions 10
Measurement and Geometry 11
Statistics, Data Analysis, and Probability 9
8 Algebra I
Number Prop., Operations, and Linear Equations 17
Graphing and Systems of Linear Equations 14
Quadratics and Polynomials 21
Functions and Rational Expressions 13

Note. Students who are not are yet taking Algebra I or are in the first year of a two-year Algebra I course take the General Math test. Students who completed Algebra I or will complete it by the end of the school-year take the Algebra I test. Adapted from STAR CST Reporting Clusters Table in Appendix A from the California Department of Education's 2004 California Standardized Testing and Reporting Post-Test Guide.

Retrieved January 12, 2005, from http://www.startest.org/archive.html

Table 3
Scale Score Ranges for CST Performance Levels

|  | Performance Levels |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 |
|  | Far Below | Below |  |  |  |
|  | Basic | Basic | Basic | Proficient | Advanced |
| English-Language Arts |  |  |  |  |  |
| Grade 6 | 150-267 | 268-299 | 300-349 | 350-393 | 394-600 |
| Grade 8 | 150-265 | 266-299 | 300-349 | 350-394 | 395-600 |
| Mathematics |  |  |  |  |  |
| Grade 6 | 150-252 | 253-299 | 300-349 | 350-414 | 415-600 |
| Grade 8 (General) | 150-256 | 257-299 | 300-349 | 250-413 | 414-600 |
| Grade 8 (Alg. I) | 150-252 | 253-299 | 300-349 | 350-427 | 428-600 |
| Note. Performance levels for eighth graders who took the General Mathematics Test we dropped one level to equate comparison with the more difficult Algebra I Test. Adapted |  |  |  |  |  |
|  |  |  |  |  |  |
| from STAR CST Scaled Score Ranges Table in Appendix B from the California |  |  |  |  |  |
| Department of Education's 2004 California Standardized Testing and Reporting Post- |  |  |  |  |  |
| Test Guide. Retrieved January 12, 2005, from http://www.startest.org/archive.html |  |  |  |  |  |

Table 4

## Demographic Variables

| $\mathrm{IB}(N=246)$ |  | Non-IB ( $N=151$ ) |  | Total ( $N=397$ ) |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $N$ | Percent | $N$ | Percent | $N$ | Percent |

Free Lunch (SES)

| Yes | 152 | $61.8 \%$ | 94 | $62.3 \%$ | 246 | $62.0 \%$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| No | 94 | $38.2 \%$ | 57 | $37.7 \%$ | 151 | $38.0 \%$ |

Ethnicity

| Hispanic | 137 | $55.7 \%$ | 70 | $46.4 \%$ | 207 | $52.1 \%$ |
| :--- | ---: | ---: | :---: | :---: | :---: | :---: |
| Black | 55 | $22.4 \%$ | 61 | $40.4 \%$ | 116 | $29.2 \%$ |
| White | 36 | $14.6 \%$ | 18 | $11.9 \%$ | 54 | $13.6 \%$ |
| Asian | 11 | $4.5 \%$ | 2 | $1.3 \%$ | 13 | $3.3 \%$ |
| Other | 7 | $2.8 \%$ | 0 | $0 \%$ | 7 | $1.8 \%$ |

Gender

| Male | 122 | $49.6 \%$ | 74 | $49.0 \%$ | 196 | $49.4 \%$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Female | 124 | $50.4 \%$ | 77 | $51.0 \%$ | 201 | $50.6 \%$ |

English Proficiency

| Proficient | 110 | $44.7 \%$ | 88 | $58.3 \%$ | 198 | $49.9 \%$ |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Learner | 49 | $19.9 \%$ | 23 | $15.2 \%$ | 72 | $18.1 \%$ |
| Reclassified | 81 | $32.9 \%$ | 33 | $21.9 \%$ | 114 | $28.7 \%$ |
| Unknown | 6 | $2.4 \%$ | 7 | $4.6 \%$ | 13 | $3.3 \%$ |

Note. English Proficiency and Ethnicity were significantly different between schools.
Socioeconomic Status (Free Lunch) and Gender were not significantly different.

Table 5
Hierarchical Summary Table for School Differences in Demographic Variables

| Variable | Eta | $V$ | $D F$ | Chi Square | $p$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| English Proficiency | .16 | .03 | 3 | 9.96 | .02 |
| Socioeconomic Status | .05 | .00 | 1 | .89 | n.s. |
| Age | .02 | .00 | 1 | .16 | n.s. |
| Gender | .02 | .00 | 1 | .12 | n.s. |
| Ethnicity | .18 | .03 | 5 | 13.07 | .02 |
| Primary Language | .08 | .01 | 2 | 2.64 | .3 |
| Overall Test |  |  |  |  |  |
| School | Shrunken Eta $=.19$ |  |  |  |  |

Table 6
Hierarchical Linear Model Analysis for Interaction of School and Demographics:
English-Language Arts Posttest

|  | Effect | Sum of | Mean |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Variable | Size | Squares | DFl | Square | F Ratio | $p$ |  |
| Main Effect |  |  |  |  |  |  |  |
| English Pretest | $r=.80$ | 643020 | 1 | 643020 | 858.86 | $<.0001$ |  |
| Gender | $R=.08$ | 6655.27 | 1 | 6655.27 | 8.89 | $<.005$ |  |
| Ethnicity | $R=.12$ | 14154 | 5 | 2830.80 | 3.78 | $<.005$ |  |
| Socioeconomic Status | $R=.09$ | 8949.79 | 1 | 8949.79 | 11.95 | $<.005$ |  |
| English Proficiency | $R=.10$ | 10630 | 3 | 3543.20 | 4.73 | $<.005$ |  |
| IB vs. Non-IB | $R=.07$ | 5292.40 | 1 | 5292.40 | 7.07 | $<.01$ |  |
| Interactions | $R=.24$ | 57999 | 54 | 1074.06 | 1.43 | .03 |  |
| Error |  | 247068 | 330 | 748.69 |  |  |  |
| Overall Test |  |  |  |  |  |  |  |
| English Posttest |  |  |  |  |  |  |  |

Note. Lowercase $r$ is correlation coefficient. Uppercase $R$ is eta. $D F 2=330$.

Table 7

Hierarchical Linear Model Analysis for Interaction of School and Demographics:
Mathematics Posttest Performance Levels

|  | Effect | Sum of |  | Mean |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Variable | Size | Squares | DFl | Square | F Ratio | $p$ |  |
| Main Effect |  |  |  |  |  |  |  |
| Mathematics Pretest | $r=.59$ | 142.28 | 1 | 142.28 | 224.54 | $<.0001$ |  |
| Gender | $R=.04$ | .53 | 1 | .53 | .84 | n.s. |  |
| Ethnicity | $R=.20$ | 16.12 | 5 | 3.22 | 5.09 | $<.0005$ |  |
| Socioeconomic Status | $R=.08$ | 2.62 | 1 | 2.62 | 4.13 | .04 |  |
| English Proficiency | $R=.17$ | 11.49 | 3 | 3.83 | 6.04 | $<.001$ |  |
| IB vs. Non-IB | $R=.11$ | 4.94 | 1 | 4.94 | 7.80 | $<.01$ |  |
| Interactions with School | $\mathrm{R}=.24$ | 22.81 | 54 | .42 | .67 | n.s. |  |
| Error |  | 209.10 | 330 | .63 |  |  |  |
| Overall Test |  |  |  |  |  |  |  |
| Mathematics Posttest |  |  |  |  |  |  |  |

Note. Lowercase $r$ is correlation coefficient. Uppercase $R$ is eta. $D F 2=330$.

Table 8
Hierarchical Linear Model Analysis: Summary Table for English-Language Arts Pretest

|  | Sum of |  |  |  |  |  | Mean |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Variable | Eta | Squares | DF1 | Square | FRatio | $p$ |  |  |  |  |  |  |
| English Proficiency | .35 | 105123 | 3 | 35041 | 21.52 | $<.0001$ |  |  |  |  |  |  |
| Socioeconomic Status | .22 | 40234 | 1 | 40234 | 24.71 | $<.0001$ |  |  |  |  |  |  |
| Gender | .19 | 29819 | 1 | 29819 | 18.31 | $<.0005$ |  |  |  |  |  |  |
| Ethnicity | .22 | 41053 | 5 | 8210.59 | 5.0 | $<.0005$ |  |  |  |  |  |  |
| IB vs. Non-IB | .04 | 1493.94 | 1 | 1493.94 | .92 | n.s. |  |  |  |  |  |  |
| Error |  | 626838 | 385 | 1628.15 |  |  |  |  |  |  |  |  |
| Overall Test |  |  |  |  |  |  |  |  |  |  |  |  |
| English-Language Arts Pretest | Shrunken Eta $=.49$ |  |  |  |  |  |  |  |  |  |  |  |

Note. DF2 $=385$.

Table 9
Hierarchical Linear Model Analysis: Summary Table for Mathematics Pretest

|  |  | Sum of | Mean |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Variable | Eta | Squares | DF1 | Square | FRatio | $p$ |  |
|  |  |  |  |  |  |  |  |
| English Proficiency | .25 | 84981 | 3 | 28327 | 9.86 | $<.0001$ |  |
| Socioeconomic Status | .19 | 49403 | 1 | 49403 | 17.20 | $<.0005$ |  |
| Gender | .17 | 40956 | 1 | 40956 | 14.26 | $<.0005$ |  |
| Ethnicity | .29 | 120879 | 5 | 24176 | 8.41 | $<.0001$ |  |
| IB vs. Non-IB | .03 | 1008.33 | 1 | 1008.33 | .35 | n.s. |  |
| Error |  | 1106113 | 385 | 2873.02 |  |  |  |
| Overall Test for Each Dependent Variable |  |  |  |  |  |  |  |
| Mathematics Pretest |  | Shrunken Eta $=.44$ |  |  |  |  |  |

Note. $D F 2=385$

Table 10
Eighth Grade Mathematics Test Difficulty Level for IB and Non-IB Schools

|  | IB | Non-IB |  | tal |
| :---: | :---: | :---: | :---: | :---: |
|  | Corrected \% | Corrected \% | $N$ | Percent |
| Test |  |  |  |  |
| General Math | 4\% | 76\% | 124 | 31\% |
| Algebra I | 94\% | 18\% | 259 | 65\% |
| Unknown | 2\% | 6\% | 14 | 3\% |

Note. Demographic variables have been partialled out for corrected estimated percentages. $p<.0001$.

Table 11
Hierarchical Summary Table for School and Math Test Difficulty Level

| Variable | Eta | $V$ | $D F$ | Chi Square | $p$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| English Proficiency | .15 | .04 | 6 | 17.29 | $<.01$ |
| Socioeconomic Status | .09 | .01 | 2 | 5.87 | .05 |
| Gender | .04 | .00 | 2 | 1.48 | $>.5$ |
| Ethnicity | .16 | .05 | 10 | 19.55 | .03 |
| IB vs. Non-IB | .53 | .57 | 2 | 226.38 | $<.0001$ |
| Overall Test |  |  |  |  |  |
| Math Test Difficulty Level | Shrunken Eta $=.57$ |  |  |  |  |
|  |  |  |  |  |  |
|  | .58 | .68 | 22 | 270.57 | $<.0001$ |

Table 12
Hierarchical Linear Model Analysis for IB Effect on English-Language Arts Posttest

|  | Effect | Sum of | Mean |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Variable | Size | Squares | DF1 | Square | FRatio | $p$ |  |
| English Pretest | $r=.80$ | 643020 | 1 | 643020 | 809.40 | $<.0001$ |  |
| English Proficiency | $R=.12$ | 14167 | 3 | 4722.31 | 5.94 | $<.001$ |  |
| Socioeconomic Status | $R=.11$ | 12128 | 1 | 12128 | 15.27 | $<.0005$ |  |
| Gender | $R=.07$ | 5520.70 | 1 | 5520.70 | 6.95 | $<.01$ |  |
| Ethnicity | $R=.09$ | 8572.77 | 5 | 1714.55 | 2.16 | .06 |  |
| IB vs. Non-IB | $R=.07$ | 5292.43 | 1 | 5292.43 | 6.66 | .01 |  |
| Error |  | 305067 | 384 | 794.45 |  |  |  |
| Overall Test |  |  |  |  |  |  |  |
| English Language Arts Posttest | Shrunken $R=.83$ |  |  |  |  |  |  |

Note. Lowercase $r$ is correlation coefficient. Uppercase $R$ is eta. $D F 2=384$.

Table 13
Hierarchical Linear Model Analysis for IB Effect on Mathematics Posttest Performance Levels

| Variable | Effect | Sum of |  | Mean |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Size | Squares | DFI | Square | $F$ Ratio | $p$ |
| Mathematics Pretest | $r=.59$ | 142.28 | 1 | 142.28 | 235.59 | <.0001 |
| English Proficiency | $R=.20$ | 16.91 | 3 | 5.64 | 9.33 | $<.0005$ |
| Socioeconomic Status | $R=.11$ | 4.68 | 1 | 4.68 | 7.75 | $<.01$ |
| Gender | $R=.01$ | . 09 | 1 | . 09 | . 15 | n.s. |
| Ethnicity | $R=.15$ | 9.08 | 5 | 1.82 | 3.01 | . 01 |
| IB vs. Non-IB | $R=.11$ | 4.94 | 1 | 4.94 | 8.18 | <. 01 |
| Error |  | 231.91 | 384 | . 60 |  |  |
| Overall Test |  |  |  |  |  |  |
| Mathematics Posttest | Shrunken $R=.65$ |  |  |  |  |  |
|  | $R=.66$ | 177.98 | 12 | 14.83 | 24.56 | <. 0001 |

Note. Lowercase $r$ is correlation coefficient. Uppercase $R$ is eta. $D F 2=384$.

Table 14

Pretest and Posttest Means for English-Language Arts Achievement Variables

| School | Pre-test |  |  | Post-test |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | M | Corrected M | SD | M | Corrected M | $S D$ | $d$ |
| IB | 316.36 | 315.52 | 49.36 | 323.99 | 321.78 | 51.65 | . 12 |
| Non-IB | 310.04 | 311.40 | 40.0 | 310.42 | 314.01 | 46.06 | . 06 |

Note. Demographic variables have been partialled out for corrected means. d is based on corrected means. The changes for pretests and posttests were significantly different across the intervention and nonintervention for English-Language Arts.

Table 15
$I B$ and Non-IB Posttest Scores for English-Language Arts and Mathematics Achievement

## Variables

| Subject | Non-IB School |  |  | IB School |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | M | Corrected M | $S D$ | M | Corrected M | $S D$ | d |
| English | 310.42 | 314.01 | 46.06 | 323.99 | 321.78 | 51.65 | . 27 |
| Mathematics | 1.91 | 1.88 | 1.09 | 2.14 | 2.16 | . 95 | . 23 |

Note. Demographic variables have been partialled out for corrected means. Standard scores were used for English-Language Arts. Performance levels were used for Mathematics due to the different levels of Mathematics posttests. The difference between IB and Non-IB posttest scores were significantly different for English-Language Arts and Mathematics.

## Abstract for Dissertation Abstracts International

Twenty years ago, the National Commission on Excellence in Education declared the United States "A Nation at Risk," describing how academic standards in public schools had fallen, failing to adequately prepare students for their futures. Since then, economically-stable families have been choosing to send their children to private schools with higher academic standards, while more disadvantaged students have remained in public schools with poorer standards and performance rates. Recently, backed by a growing body of research and government funding, several public schools have implemented comprehensive, innovative educational programs in efforts to raise academic standards and student achievement among their students. The International Baccalaureate Middle Years Program (IBMYP) is one such program that espouses rigorous academic standards, a holistic approach to learning, and intercultural awareness among students. In 1999, it was implemented at a public middle school in Southern California in an effort to more successfully meet the needs of its diverse students and improve academic performance. Using California Standards Tests (CSTs), academic achievements in mathematics and English-language arts were evaluated for students who had received two years of the IBMYP at this public school. Compared with students in the same school district who received standard educational curriculum, students in the IBMYP showed significantly greater improvement in their CST Mathematics and English-Language Arts scores. Further, significantly more students in the IBMYP took a higher-level mathematics CST, suggesting that the IBMYP better prepared students for higher level mathematics courses. This finding is consistent with the educational literature that innovative, comprehensive school programs with a unifying vision and
rigorous standards appear to be more effective in meeting the academic needs of students in today's public schools. Other factors that were not analyzed in this study could have also impacted student achievement and should be taken into consideration. Future studies should evaluate if particular characteristics of the IBMYP, such as its approach to holistic learning or emphasis on intercultural awareness, impact student achievement.

Appendix A

## Executive Summary

## Educational Evaluation of the

# Imternational Baccalaureate Middle Years Program 

Executive Summary

## Introduction

Pasadena's federally funded Innovative Projects program was implemented at Wilson Middle School in 1999. At this time, Wilson enrolled the highest percentage of students of minority background of any middle school in the district, despite the fact many more non-minority families with children in grades 6-8 lived in the school's attendance zone. Academic performance among Wilson students was also the lowest among the middle schools of the district. For these reasons, Pasadena Unified School District (PUSD) carefully considered innovative education improvement programs that would serve to encourage a broader diversity of attendance-zone students to remain at Wilson and to improve the learning environment and outcomes at the public school for all students.

The International Baccalaureate Middle Years Program (IBMYP) was implemented at Wilson Middle School in the fall of 1999 and received full accreditation from the IB Organization in February 2002. The IBMYP had been brought into Wilson Middle School in conjunction with a PUSD initiative, the Magnet Schools Assistance Program. The $\mathbb{I B}$ Program was selected among several programs for its rigorous academic standards, multi-cultural content, emphasis on creativity and technology, and other opportunities outside the academic setting.

The IBMYP at Wilson provides sixth through eighth grade students a study of various traditional school disciplines that include languages, mathematics, sciences, arts, physical education, and technology. Five perspectives underlie the curriculum and are integrated throughout the subject areas: approaches to learning, community service, health and social education, environment and homo faber. The IBMYP follows naturally the Primary Years Program (at Willard Elementary School), and serves as preparation for the Diploma Program (at Blair High School), however, none is a prerequisite for another.

## Evaluation Methodology

The purpose of this educational evaluation was to assess the effectiveness of the IBMYP at Wilson Middle School in terms of the school district's primary objective, to improve academic performance in reading and mathematics as measured by annual Statemandated assessment of skills acquisition. We evaluated academic performance in English-Language Arts and Mathematics by analysing the California Standards Test (CST) scores of students who had received two years of the IBMYP curriculum at Wilson, and comparing these students' scores with students receiving traditional California education curriculum at Eliot Middle School, also in PUSD. Demographic information was also retrieved, however the effects of demographic variability on student achievement was not explored. Demographic variability among the students was corrected for so that the effects of the IBMYP applied equally to all students.

## Findings and Conclusion

Students who received the IBMYP at Wilson showed significantly greater improvement in their California Standards Test scores in both English-Language Arts and Mathematics than students receiving standard educational curriculum at Eliot. Further, significantly more students in the IBMYP took the higher-level Algebra I CST in eighth grade than at the comparison school, suggesting that the IBMYP encouraged earlier entry into higherlevel mathematics courses.

CST Mean Pretest and Posttest Scores for English-
Language Arts in IB and Non-IB Schools


Note. Pretest differences between the schools were not statistically significant.
Posttest differences, after partialling out demographics and pretest scores, were statistically significant.

CST Posttest Performance Levels for Mathematics

## Achievement in IB amd Non-IB Schools



Note. Pretest differences between the schools were not statistically significant.
However, the Non-IB school had a higher average pretest score than the IB school.
Pretest scores are not shown here because they are not comparable to adjusted performance levels of 8 th grade-level mathematics posttests.

Eighth Grade Mathematics Test Difficulty for IB and
Nom-IB students


Note. The difference between schools in difficulty level of mathematics tests taken by students is attributed to the IB program's emphasis on earlier entry into higher level mathematics courses.

The findings of this evaluation suggest that an innovative, comprehensive program like the IBMYP is more effective in raising student achievement than standard educational curriculum. These findings are consistent with educational literature that empirically supports programs that provide the whole school community with a collective unity of purpose in addition to rigorous academic standards.

## Limitations and Recommendations for Future Evaluation

Factors that may have impacted student achievement and should be investigated further are the IBMYP's built-in philosophical emphases on the interrelatedness of different subjects, encouragement of student awareness of learning paradigms, focus on intercultural awareness, and the development of sound communication skills. Further, the IBMYP's five areas of interaction and eight core subject areas may be more engaging for today's diverse public school population. It is likely that a combination of these factors that is mutually impacting at all of the different levels of the school-administration, teachers, parents, students--had an overall effect on student achievement.

Other factors that were not analyzed could have also impacted student achievement and should be taken into consideration. These include differences between the two schools in average class size, attendance rates, incidence of student suspension, and parental involvement. It is quite likely that the enthusiasm of those school community members who backed the implementation of the IBMYP played a significant role in raising the morale of the teachers, staff, parents, and students, setting a precedent for student learning and academic achievement.

## Appendix B

## Administrative Report

The administrative report was written to be presented to a lay audience including school administrators, teachers, support staff, parents, and interested community members. It serves to present the literature review, methods and results, and discussion in a brief, clear, and concise manner which is easily understandable and can serve to generate further discussion about how this evaluation can be utilized in the applied school setting. The administrative report is presented in Microsoft Office PowerPoint (2003) format, with one slide printed per page for a total of 20 pages.

# Educational Evaluation of the International Baccalaureate Middle Years Program 

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## Abstract

The International Baccalaureate Middle Years Program (IBMYP) was implemented at a Southern California middle school in order to meet the academic needs of its diverse student population and improve performance on standardized tests. Compared with students from a school with conventional educational programming in the same school district, students who received two years of the IBMYP showed greater improvement on the California Standards Tests in both English-Language Arts and Mathematics.

## Introduction

. There is compelling evidence that academic standards in public schools have fallen short in terms of preparing students from diverse social, ethnic, and economic backgrounds for life and work in today's global market economy (Patterson, 2003).

- As a result, several privileged families have chosen private schools, leaving public schools with predominantly more "disadvantaged" students than in prior years (Center for Education Reform, 1998).
- In response to research demonstrating that higher academic standards are more effective in meeting students academic needs, California implemented Content Standards designed to guide educational curriculum and help students achieve at higher levels (California State Board of Education, 2005).
- Educational literature suggests that other factors besides more rigorous academic standards are needed for students to improve academically.
- Levin and Hopfenberg (1991) and Goldberg (2001) emphasize the importance of a "collective unity of purpose" among the entire school community, which are offered by several empirically-driven schoolwide improvement programs.

Public schools have been seeking such comprehensive, innovative educational programs to raise academic standards and student achievement among their diverse student population and to attract students who have migrated to private schools (Viadero, 2002).

## The International Baccalaureate Organization and Programs

w. The IBO is a nonprofit educational foundation based in Switzerland and founded in 1968.

- Sought to establish a unified curriculum across different countries and provide university entry credential.
- There are currently $1,425 \mathrm{IB}$ authorized schools in 115 countries.
- Motivated by an idealistic philosophy that creativity, innovation, global awareness, and intercultural tolerance were central to education.
a Offers three educational programs at the elementary, middle, and secondary levels.
- All three programs have IBO curriculum guides for every grade and subject that allow schools to keep within their local educational requirements.
- All programs include formative and summative assessment at each level of the school.


## The International Baccalaureate Organization Mission Statement

Through comprehensive and balanced curricula coupled with challenging assignments, the International Baccalaureate Organization aims to assist schools in their endeavors to develop the individual talents of young people and teach them to relate the experience of the classroom to the realities of the work outside. Beyond intellectual rigor and high academic standards, strong emphasis is placed on the ideals of international understanding and responsible citizenship, to the end that IB students may become critical and compassionate thinkers, lifelong learners and informed participants in local and world affairs, conscious of the shared humanity that binds all people together while respecting the variety of cultures and attitudes that makes for the richness of life.

## The International Baccalaureate Middle Years Program

The IBMYP is designed to teach students to become independent learners who can recognize relationships between school subjects and the world outside, who can adapt to new situations and combine relevant knowledge, practical and social intelligence to solve authentic problems alone or in groups. Successful teaching of the program requires commitment to its fundamental principles on the part of the whole school community, and a high degree of communication and collaboration between teachers.

The IBMYP is based on three fundamental principles:

A holistic view of learning that emphasizes the interrelatedness of subjects and learning communities
2) Intercultural awareness at the personal, local, and global levels
The development of communication in expression and integration.

## The International Baccalaureate Middle Years Program

Five "Areas of Interaction" lie at the core of the curriculum:

Approaches to Learning (How do I learn best?)
2) Community and Service (How do we live in relation to each other?)
3) Homo Faber (Why and how do we create?)
4) Environment (Where do we live?)
5) Health and Social Education (How do I think, act, and grow?)

- Eight Core Subjects make up the curriculum:

1) Language A (language of instruction)
2) Language $B$ (foreign language)
3) Humanities (history and geography)
4) Sciences (biology, chemistry, physics)
5) Mathematics (one of the five branches of math)
6) Arts (visual and performing arts)
7) Physical Education (wide range of activities)
8) Technology (computer and design technology)

## Educational Evaluation of the IBMYP

- The IBMYP was implemented at a culturally-diverse middle school in Southern California as part of a government-funded project to adopt alternative educational programs designed to raise academic standards.
- We evaluated the effectiveness of the IBMYP in improving students' academic performance, after two years of receiving the program, in English-Language Arts and Mathematics.
c. The California Standards Tests (CSTs) were used to measure student achievement in English-Language Arts and Mathematics.
- The students who received two years of the IBMYP were compared with students who received standard educational curriculum from a middle school in the same district.
- Based on the educational literature reviewed, we predicted that the more rigorous standards and comprehensive, integrative approach of the IBMYP would yield a greater overall improvement in students' CST scores in EnglishLanguage Arts and Mathematics compared to standard education curriculum in the state of California.


## Evaluation Participants

- Participants included 397 middle school students:
. 246 received two years of the IBMYP
- 151 received standard educational curriculum
- All students began $6^{\text {th }}$ grade during the 2001-2002 school year and completed their seventh and eighth grade years at the same schools


## Evaluation Participants: Ethnicity

## Ethnicity of Students in 18 School



| $\square$ Hispanic |
| :--- |
| Q Black |
| Q White |
| $\square$ Asian |
| Oher |

Ethmicity of Students in Non-IB School


| $\square$ Hispanic |
| :--- |
| 0 Black |
| $\square$ White |
| $\square$ Asian |
| Other |

## Evaluation Participants: English Proficiency

## English Proficiency in IB School



English Proficiency in Non-IB School

$\square$ Proficient
鼠 Leamer
$\square$ Reclassified $\square$ Unknown

## | Evaluation Participants: Gender

## Gender Breakdown of Participants



## Evaluation Participants: Socioeconomic Status

## Socioeconomic Status of Participants



Free Lanch $\square$ No Free Lunch

## Evaluation Measurement and Procedures

- Sixth grade, Spring 2002 and eighth grade, Spring 2004 California Standards Test standard scores and performance levels were used for analyses.
: All sixth grade students took the same English-Language Arts and Mathematics CSTs
* All eighth grade students took the same English-Language Arts CSTs
- Eighth grade students took either the General Mathematics Test, based on sixth and seventh grade-level standards, or Algebra I, based on eighth grade-level standards
- Scaled scores were used to evaluate student achievement for English-Language Arts. (Scores range from 150-600)
- Performance levels were adjusted and used to evaluate student achievement for Mathematics to equate the different eighth grade tests that were taken. (Performance levels range from 1-5)
- The effects of demographic variability on student achievement was not explored in this study.
- Demographic variability between schools was corrected for so that the effects of the IBMYP applied equally to all students.


## Evaluation Results

CST Mean Pretest and Posttest Scores for EnglishLanguage Arts in IB and Non-IB Schools


Pretest differences between the schools were not statistically significant.

Posttest differences, after partialling out demographics and pretest scores, were statistically significant.

## Evaluation Results

CST Posttest Performance Levels for Mathematics Achievement in IB and Non-IB Schools


Pretest differences between the schools were not statistically significant. However, the Non-IB school had a higher average pretest score than the IB school.

Pretest scores are not shown here because they are not comparable to adjusted performance levels of $8^{\text {th }}$ grade-level mathematics posttests.

## Evaluation Results



The difference between schools in difficulty level of mathematics tests taken by students is attributed to the IB program's emphasis on earlier entry into higher level mathematics courses.

## Conclusions

- As predicted, students who received the IBMYP showed greater improvement in their CST scores in English-Language Arts and Mathematics than students receiving standard educational curriculum in the same school district.
- The IBMYP also better prepared students for higher-level mathematics course.
- These findings suggest that an innovative, comprehensive program like the IBMYP that encompasses the whole school is more effective in raising student achievement than content standards alone.
- These findings also suggest that the IBMYP is more effective in raising academic achievement for all of today's diverse public school student population.


## Limitations and Recommendations for Future Study

- Other factors that were not analyzed in this study could have also impacted student achievement and should be taken into consideration:
- The IB school had a slightly smaller, school-wide average class size than the non-IB school.
- Both schools had the same pupil-to-teacher ratio.
a There was no difference in average teacher experience.
- The IB school had higher attendance rates.
: The non-IB school had a higher incidence of student suspensions.
- Parental support was probably higher in the IB school due to its reputation and emphasis on the whole school community.
- Staff morale at all levels-administration, teachers, support staff-likely impacted student learning and achievement.
- Future evaluations should explore if there were particular characteristics of the IBMYP that impacted student achievement, such as:
m Interrelatedness of different subjects
- Personal development of learning paradigms
- Focus on intercultural and global awareness
- IBMYP curriculum guides
- The Five Areas of Interaction
- Building and practicing communication skills


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## Appendix C

## Plan for Professional Presentation

A presentation of the administrative report will be given to administrative staff and teachers at the middle school which was evaluated in October of 2005. Following this presentation, a discussion will be facilitated among those present as to the best course of action to take in light of the presented findings. A copy of the executive summary will be made available to all who are present as well as relevant district and school staff who are not able to attend.

Appendix D
Vita
Amy B. Willcoxom, MA

## EDUCATION

September 2005 Clinical Psychology PsyD Candidate; Graduate School of Psychology, Fuller Theological Seminary; Pasadena, CA

September 2004 Master of Arts in Theology; Graduate School of Theology, Fuller Theological Seminary; Pasadena, CA

June $2000 \quad$ Master of Arts in Psychology; Graduate School of Psychology, Fuller Theological Seminary; Pasadena, CA

August 1996 Bachelor of Science, Magna Cum Laude, in Psychology with minor in Speech Communication; Northern Arizona University; Flagstaff, $A Z$

## CLINICAL EXPERIENCE

10/04-9/05 Psychology Interm - Wright Institute Los Angeles, Hedda Bolgar Psychotherapy Clinic and Susan B. Krevoy Eating Disorders Program; Los Angeles, CA

- Provided ongoing individual psychodynamic psychotherapy for adults with various issues
- Provided assessment, individual, and multifamily group therapy for eating disorders patients

9/03-8/04

10/01-6/03 Program Facilitator/Mentor - Young and Healthy "I Think I Can": The Positive Classroom; Pasadena, CA

- Facilitated classroom education on problem-solving and coping skills for fifth graders
- Mentored practicum students in organization and delivery of curriculum materials in class
- Conferred with program director and school teachers in coordinating classroom services

9/02-9/03 Student Psychologist (Practicum III) - Center For Aging Resources; Pasadena, CA

- Provided ongoing individual psychotherapy and case management for older adults
- Received weekly supervision and training addressing existential and health issues of aging
- Provided assessment and treatment for physical, cognitive, emotional and social functioning

9/99-6/00 Student Psychologist (Practicum I) - Young and Healthy; Pasadena, CA

- Provided individual and group therapy with children referred for behavioral problems
- Conferred with teachers and parents in developing and implementing treatment plans
- Facilitated "I Think I Can" classroom education on problem-solving and coping skills

3/99-5/99 Clinical Therapist Trainee - Fuller Psychological and Family Services; Pasadena, CA

- Provided low-fee, short-term individual psychotherapy with inner-city, minority adults
- Formulated intake report, DSM diagnosis, and treatment plan for brief psychotherapy
- Participated in group and individual supervision with audio and videorecorded sessions

10/97-3/98 Partial Care/Intensive Outpatient Program Coordinator - Phoenix Adolescent Recovery Center "PARC Place"; Phoenix, AZ

- Updated and developed program materials and facilitated psychoeducational groups
- Completed individual treatment plans and weekly reports and supervised patient charting
- Conferred with therapists, case-workers, parents, and staff for treatment programming

3/98-9/98, Substance Abuse Counselor/Shift Leader - Phoenix Adolescent
10/96-10/97 Recovery Center "PARC Place"; Phoenix, AZ

- Facilitated communication between patients and therapists, advised staff technicians
- Coordinated psycho-educational process groups and charted treatment progress
- Provided counseling, conflict mediation and crisis intervention for residential patients


## TEACHING EXPERIENCE

9/04-12/04 Adjunct Professor - Psyc290: Human Growth and Development;

Department of Undergraduate Psychology, Azusa Pacific University; Azusa, CA

- Prepared weekly lectures and discussion on various approaches of developmental theory
- Developed course syllabus with assignments integrating critical thought, science, and theory
- Facilitated students' development through personal and professional application of theory

Adjunct Professor-Psyc225: Personal and Social Adjustment;
9/03-12/03 Department of Undergraduate Psychology, Azusa Pacific University; Azusa, CA

- Prepared weekly lectures and activities on psychological theory as applied to students' lives
- Developed course syllabus with assignments integrating critical thought, science, and theory
- Facilitated students' growth through self-awareness, relationships, and openness to diversity

1/01-3/01, Teaching Assistant/Guest Lecturer - PC832: Medical Issues in 1/04-3/04 Psychology for Donald Thomas, MD; Graduate School of Psychology, Fuller Theological Seminary; Pasadena, CA

- Presented case-study and addressed integrating medical and spiritual issues in psychotherapy
- Contributed to class discussion on the relationship between the physical, mental and spiritual
- Completed advanced readings on stress, psychoneuroimmunology and related health issues


## RESEARCH EXPERIENCE

3/03-6/05 Program Evaluation - Dissertation project under the advisement of
Richard Gorsuch, PhD; Graduate School of Psychology, Fuller
Theological Seminary; Pasadena, CA

- Assessed effectiveness of the International Baccalaureate Program in public middle school
- Conducted quantitative and qualitative analyses and provide feedback to district and schools
- Conferred with technical staff, administrators and teachers for useful application of findings

2/99-6/00 Research Assistant - USC/CHMC Family Medicine Residency Program; Los Angeles, CA

- Assisted in research grant on Finding the Family Life Cycle in Inner City Communities
- Facilitated focus groups, developed family assessment survey, and interviewed families
- Conducted chart audits, analyzed data, and created and maintained data files for study

1/99-6/99 Research Assistant - Alexis Abernethy, PhD; Graduate School of Psychology, Fuller Theological Seminary; Pasadena, CA

- Assisted with research project on Religiousness, Emotions, and Health in Adult Development
- Conducted literature review, data entry, and multivariate statistical analyses using Unimult
- Presented findings at the $21^{\text {st }}$ Annual Society for Behavioral Medicine National Conference

8/95-8/96 Research Assistant - Kelly Krietsch, PhD; Department of Psychology, Northern Arizona University; Flagstaff, AZ

- Assisted with project on Obsessive-Compulsive Personality, Anger, and Illness Behavior
- Scored questionnaires, analyzed data using SPSS-X and reviewed relevant literature
- Presented findings at the American Association for the Advancement of Science Conference


## SPECIALIZED PROFESSIONAL TRAINING

10/00-10/01 Jungian Psychology Reading Seminar-- Advised by Al Dueck, PhD;
Graduate School of Psychology, Fuller Theological Seminary; Pasadena, CA

- Read and discussed original works by Carl Jung as well as contemporary Jungian theorists
- Discussed application of Jungian thought to culturally-relevant assessment and intervention
- Reflected on Jung's conceptualization of the self, cultural symbols, and theological relevance

6/00-6/01

9/99-5/00

9/93-5/96

Professional Liaison - Psychology Graduate Union; Graduate School of Psychology, Fuller Theological Seminary; Pasadena, CA

- Coordinated presentations for graduate students on personal and professional development
- Networked with community psychologists to impart current information about clinical issues
- Served as an active participating cabinet member for the Psychology Graduate Union

Cultural Diversity Track Chair - Peer Support Volunteer Network;

Counseling and Testing Center; Northern Arizona University; Flagstaff,
AZ.

- Coordinated and facilitated educational programs stressing diversity and multicultural issues
- Interviewed and trained new volunteers and served as referral source for Counseling Center
- Integrated efforts with tracks emphasizing HIV/AIDS, Substance Abuse, and Self-Esteem


## PROFESSIONAL PRESENTATIONS

Living Out of Your Giftedness in Christian Community; Crossroads Fellowship for Young Adults Retreat, Lake Avenue Church; Lake Arrowhead, CA

School-Based Programming for Empowering Teen Girls; Dr. Melissa
Johnson and Del Mar Girl Power Presentation; Girls' Resource Network Meeting; Pasadena, CA

The Experience of Women in Theology ared Psychology; Christian Association for Psychological Studies, Western Conference, Paper Presentation; San Diego, CA

Emotional Changes During Pre-Adolescence; Parenting Seminar at Wilson Middle School, Young and Healthy; Pasadena, CA

Spirituality, Emotions, and Health in Older Adults; Society for Behavioral Medicine $21^{\text {st }}$ Annual Sessions, Poster Presentation; Nashville, TN Anger; American Association for the Advancement of Science, Southwestern and Rocky Mountain Division $72^{\text {nd }}$ Annual Meeting, Paper Presentation; Flagstaff, AZ

## PROFESSIONAL TRAINING SEMINARS

Human Sexuality; Continuing Education Seminar presented by Linda De Villers, PhD for Pepperdine University, Graduate School of Education and Psychology (10 hours); Culver City, CA

Detection and Treatment of Substance Abuse; Continuing Education Seminar presented by Laurie Schoellkopf, PsyD, for Pepperdine University, Graduate School of Education and Psychology (15 hours); Culver City, CA

Child Abuse Assessment and Reporting; Continuing Education Seminar presented by Pamela Harmell, PhD, and Jana Martin, PhD , for Pepperdine University, Graduate School of Education and Psychology (7 hours); Culver City, CA

Advanced Course on Legal and Ethical Issues for Mental Health Professionals; Continuing Education Seminar presented by Michele Licht, JD, for Professional Psych Seminars (6 hours); Pasadena, CA

Symbolic Externallzation Workshop; Continuing Education Seminar presented by John Friesen, PhD , for the Christian Association for Psychological Studies; Azusa, CA

Spirituality, Relligion, and Health; Seminar presented by Carl Thoresen, PhD, John Martin, PhD, and Dale Matthews, MD at the $20^{\text {th }}$ Annual Meeting of the Society of Behavioral Medicine (6 hours); San Diego, CA Personality, Health, ared Motivation; Continuing Education Seminar presented by William Polonsky, PhD for Mind Matters Seminars (6 hours); Phoenix, AZ

Self-Esteem and Health; Continuing Education Seminar presented by Jennifer Campbell, PhD for Mind Matters Seminars (6 hours); Phoenix, AZ

The Immune System: Minding the Body and Embodying the Mind; Continuing Education Seminar presented by Margaret Kemeny, PhD for Mind Matters Seminars (6 hours); Phoenix, AZ

Mood, Mind, and Appetite; Continuing Education Seminar presented by Laura Pawlak, PhD, RD for the Institute for Natural Resources (6 hours); Phoenix, AZ

## PROFESSIONAL AFFILIATIONS \& ACADEMIC AWARDS

- American Psychological Association
- Society of Behavioral Medicine
- Christian Association for

Psychological
Studies

- Psi Chi National Honor Society in Psychology
- Honor Society of Phi Kappa Phi
- Golden Key National Honor Society
- Award for Outstanding Scholarship
- Academic Achievement Award
- Presidential Scholarship Award
- President's Service Award
- Who's Who Among Students in American Colleges and Universitie


## REFERENCES

## Carol Edwards, PhD

| Assessment Supervisor/Clinical Psychologist | 1000 W. Carson St. |
| :--- | :--- |
| Department of Adult Psychology/Psychiatry | Torrance, CA 90509 |
| County of Los Angeles Harbor-UCLA Medical Center | $(310) 222-1743$ |

## Richard Gorsuch, PhD

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180 N. Oakland Ave.
Graduate School of Psychology
Pasadena, CA 91101
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(626) 584-5527

Terrill Helander, PhD
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37 N. Holliston Ave.
"I Think I Can" The Positive Classroom
Pasadena, CA 91106
Young and Healthy
(626) 795-5166

Melissa Johnson, PhD
Supervisor/Director
95 N. Marengo Ave.,
Institute for Girls' Development
Suite 205
Pasadena, CA 91101
(626) 585-8075

## Paulene Popek, PhD

| Supervisor/Clinical Director | 9911 W. Pico Blvd., |
| :--- | :--- |
| Wright Institute Los Angeles | Suite 720 |
|  | Los Angeles, CA 90035 |
|  | $(310) 277-2796$ |

## Donald Thomas, MD

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430-C Orange Grove
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