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AUTHOR	Kirkpatrick, Nanda D.; And Others
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ABSTRACT

Twenty-one magnet programs in the Houston Independent School District in Texas feature an enriched curriculum in science, math, and/or computers (science/math). Of these, 12 are elementary programs, 4 are middle school programs, and 5 are high school programs. In these programs, a total of 9,574 students were served during the 1990-91 school year: 6,372 elementary, 3,358 middle, and 1,834 high school students. Fifth grade students enrolled in the seven elementary Science/Math Add-On Programs did not score significantly higher than the comparison groups on the MAT6 science tests, and in only one program did students score significantly higher than their matched comparison group on the MAT6 math tests for the 1988-89 or 1990-91 school years. Fifth grade students enrolled in five elementary School-Within-A-School Programs (SWAS) scored significantly higher than the comparison groups on the MAT6 science tests during the 1988-89 or 1990-91 school years after being enrolled 3 to 5 years, respectively, in the enrichment programs. In two of the SWAS programs, students scored significantly higher than the comparison groups on the total math tests. Eighth grade students enrolled in the three middle school SWAS programs that were evaluated scored significantly higher than the comparison group on the MAT6 science tests during the 1988-89 or 1990-91 school years. In two of the SWAS programs, students scored significantly higher than the comparison groups on the total math tests. (Author/MDH)

1990–91 HISD Magnet Evaluation: Science, Math, and Computer Enrichment Programs

Kirkpatrick, Nanda D., M.A.
Tullis, Richard J., Ed.D.
Sanchez, Kathryn S., Ed.D.
Gonzalez, J.

HISD RESEARCH & EVALUATION
HOUSTON INDEPENDENT SCHOOL DISTRICT

Executive Summary

1990-91 HISD Magnet Evaluation:
Science, Math, and Computer Enrichment Programs

Overview

There are twenty-one Magnet programs that feature an enriched curriculum in science, math, and/or computers. Of these, twelve are elementary programs, four are middles school programs, and five are high school programs. Thirteen of these programs are School-Within-A School programs, seven are Add-On Programs, and one is a Separate and Unique School. In these programs, a total of 9,574 students were served during the 1990–91 school year. Of these, 6,372 were elementary school students, 3,358 were middle school students, and 1,834 were high school students.

Methodology

General information, goals, and objectives of Magnet programs were obtained from interviews and written materials provided by the Director of Enrichment Programs and Magnet Specialists. To gather program implementation information, personal interviews of all coordinators and site visits of all elementary and middle school campuses were conducted. Brochures and campus program summaries were also provided by the campus staff and the Bureau of Enrichment. Information concerning the student enrollment, ethnicity, attendance, and academic achievement for each of the Magnet schools and programs was obtained from the HISD Student Master File.

To evaluate the academic achievement of students who were enrolled in these Magnet programs, for elementary level programs, only fifth grade students who had been enrolled in the programs since the first grade were included in the analysis. For middle school programs, only eighth grade students enrolled since the sixth grade were included. For comparison, Magnet students were matched demographically with non-Magnet students. An analysis of variance was used to compare standardized achievement test scores.

To describe the teachers of the Magnet programs, a questionnaire (see Appendix 2) was distributed to teachers of science, math, and computers in each program. Coordinators were also asked to provide information about the number of specialty teachers at the school. Completed staff information forms from 21 (100%) of the programs were returned. According to the data reported from the schools, there were 142 specialty teachers in these programs: 55 math, 64 science, and 23 computer teachers. A limited number of these teachers were instructors in two of the specialty areas. A total of 137 (96%) of the surveys were returned.

Evaluation Questions and Findings

Research Question 1: What are the characteristics of the Magnet programs that provide an enriched curriculum in science, math, and/or computers (Science/Math programs)?

A common goal for the elementary and middle school programs includes providing students with an enriched curriculum in science, math, and/or computers based on an instructional style that emphasizes a hands-on laboratory approach and developing problem solving and higher order thinking skills. These programs also strive to enhance students' interest in the specialty areas and increase their awareness of career opportunities in those fields. Computer literacy is an important component of most of these programs. The programs at most of these campuses feature well-equipped science, math, and/or and computer laboratories. Each of the high school programs features a unique specialty curriculum.

There are twelve elementary schools that specialize in science, math, and/or computer enrichment. There are four middle school programs and five high schools/programs that specialize in science, math, and/or computers. The five high schools programs are B.T. Washington's High School for the Engineering Professions, the High School for Health Professions, Reagan Computer Technology program, Milby Science Institute, and Sterling Aviation Sciences program.

Regarding academic admission requirements, most of the elementary level programs require only that a student have grade level performance academically and on standardized achievement tests. The enrollment criteria for the middle school programs require that a student must have above average academic performance and grade level performance in science and math on standardized achievement tests. A student interview or student written letter is also part of the enrollment criteria for these programs. Each high school program has its own unique criteria. All students must also meet the general Magnet admission requirements.

Research Question 2: What were the number and characteristics of the students that were served by the Magnet programs that provide an enriched curriculum in science, math, and/or computers during the 1990–91 school year?

A total of 9,574 students were served by these programs in 1990–91. This number includes 6,372 elementary students, 1,368 middle school students, and 1,834 high school students. The ethnicity of the entire population was 73.5% minority. The average attendance rate of students during the 1990–91 school year was 95.4% and 96.3% for the elementary and secondary level programs, respectively.

Research Question 3: How did the academic achievement level of students participating in Science/Math programs during the 1990–91 school year compare with that of students not participating in Magnet programs?

Students enrolled in elementary level Science/Math Add-On Programs did not score significantly higher than the comparison group on the MAT6 science tests during the 1988–89 and 1991–91 school years after being enrolled three and five years, respectively, in the enrichment programs. In only one program did students score significantly higher than their matched comparison group on the MAT6 math tests for the 1988–89 or 1990–91 school years.

Students enrolled in elementary level School-Within-A-School programs scored significantly higher than the comparison groups on the MAT6 science tests during the 1988–89 and 1990–91 school years after being enrolled three and five years, respectively, in the enrichment programs. The results also indicated that in two of the four SWAS programs offering a math enrichment program, students scored significantly higher than the comparison groups on the total math tests.

The findings indicate that with regard to increased student achievement, the two strongest elementary level Science/Math SWAS programs are the programs at Wainwright and Red elementary schools. The analyses indicate also that the program at Lantrip Elementary School, specializing in environmental sciences, also results in increased science achievement scores for the students enrolled in the program.

Students enrolled in the middle school Science/Math SWAS programs scored significantly higher than the comparison groups on the MAT6 science tests during the 1988–89 or 1991–91 school years after being enrolled three and five years, respectively, in the enrichment programs. In two of the three SWAS programs, students scored significantly higher than the comparison groups on the total math test. The findings indicate that all three Science/Math SWAS programs at Clifton, Fondren, and Hartman middle schools result in substantial gains in achievement scores in the areas of science and math for the students enrolled in the programs.

Research Question 4: What was the level of professional and academic training of specialist teachers teaching in the Science/Math programs during the 1990–91 school year?

Sixty-eight percent of the elementary level teachers, 48% of the middle school teachers, and 47% of the high school teachers reported having greater than ten years of teaching experience. Forty-four percent of the elementary level teachers and 56% of the secondary level teachers reported having earned a master's degree. Thirty-eight percent of the secondary level teachers reported having earned greater than six hours of college credit in their specialty area during the last three years, and greater than half of the teachers at all levels reported attendance of greater than twelve hours of workshops, seminars, or in-services pertaining to their specialty subject since the Fall of 1988.

1990–91 HISD Magnet Evaluation: Science, Math, and Computer Enrichment Programs

Department of Research and Evaluation
Houston Independent School District

Abstract

Twenty-one Magnet programs feature an enriched curriculum in science, math, and/or computers (Science/Math). Of these, twelve are elementary programs, four are middle school programs, and five are high school programs. In these programs, a total of 9,574 students were served during the 1990–91 school year: 6,372 elementary, 3,358 middle, and 1,834 high school students. Fifth grade students enrolled in the seven elementary Science/Math Add-On Programs did not score significantly higher than the comparison groups on the MAT6 science tests, and in only one program did students score significantly higher than their matched comparison group on the MAT6 math tests for the 1988–89 or 1991–91 school years. Fifth grade students enrolled in five elementary School-Within-A-School programs scored significantly higher than the comparison groups on the MAT6 science tests during the 1988–89 or 1990–91 school years after being enrolled three and five years, respectively, in the enrichment programs. In two of the SWAS programs, students scored significantly higher than the comparison groups on the total math tests. Eighth grade students enrolled in the three middle school SWAS programs that were evaluated scored significantly higher than the comparison group on the MAT6 science tests during the 1988–89 or 1990–91 school years. In two of the SWAS programs, students scored significantly higher than the comparison groups on the total math tests.

Introduction

Providing quality ethnically integrated education is the primary objective of Magnet schools. The number of HISD Magnet programs that are being offered to HISD and area students has grown from 32 in 1974–75 to 89 in 1990–91. Programs have been added each year and existing programs have been modified to meet the needs of changing student populations. This evaluation was conducted to describe not only the programs, but also the students and teachers participating in Magnet programs that provide an enriched curriculum in science, math, and/or computers. Further, this report presents an evaluation of the effects of these programs on student academic achievement in the enrichment areas.

The following research questions were addressed:

1. What are the characteristics of the Magnet programs that provide an enriched curriculum in science, math, and/or computers (Science/Math programs)? (See page 3.)
2. What were the number and characteristics of the students that were served during the 1990–91 school year by the Science/Math Magnet programs that provide an enriched curriculum in science, math, and/or computers? (See page 12.)
3. How did the academic achievement level of students participating in Science/Math programs during the 1990–91 school year compare with that of students not participating in Magnet programs? (See page 16.)
4. What was the level of professional and academic training of specialist teachers teaching in the Science/Math programs during the 1990–91 school year? (See page 36.)

Methodology

General information, goals, and objectives of Magnet programs were obtained from interviews and written materials provided by the Director of Magnet Programs and Magnet Program Research Specialists. To gather program implementation information, personal interviews of all coordinators and site visits of all elementary and middle school campuses were conducted. Brochures and campus program summaries were also provided by the campus staff and the Bureau of Enrichment.

Information concerning the student enrollment and ethnicity for each of the Magnet schools and programs was obtained from the HISD Student Master File. Data for the Add-On Programs and Separate and Unique Schools were as of April 27, 1991. Data for the School-Within-A-School programs were as of June 18, 1991. Information concerning the student attendance and academic achievement for each of the Magnet schools and programs was obtained from the HISD Student Master File.

To evaluate the academic achievement of students who had been enrolled in Science/Math elementary level Magnet programs, fifth grade students who had been enrolled in the programs since the first grade were included in the analysis. For middle school programs, eighth grade students enrolled since the sixth grade were included. For comparison, Magnet students were matched demographically with non-Magnet students. Standardized achievement test scores were obtained and compared.

To describe the teachers of the Magnet programs, a questionnaire (see Appendix 2) was distributed to teachers of science, math, and computers in each program. Coordinators were also asked to provide information about the number of specialty teachers at the school. Completed staff information forms from 22 (100%) of the programs were returned. According to the data reported from the schools, there were 142 specialty teachers in these programs: 55 math, 64 science, and 23 computer teachers. A limited number of these teachers were instructors in two of the specialty areas. A total of 137 (96%) of the surveys were returned.

Results

Question 1 What are the characteristics of the Magnet programs that provide an enriched curriculum in science, math, and/or computers (Science/Math programs)?[1]

Method

The intent of this research question was to describe the individual campus level Magnet programs as they were being implemented during the 1990–91 school year. General information, goals, and objectives of Magnet programs were obtained from interviews and written materials provided by the Director of Magnet Programs and Magnet Specialists. The elementary and middle school programs were divided into categories based on the type program (e.g., School-Within-A-School, Add-On Program). Of particular interest was to describe the programs and to point out similarities and differences among these groups of programs. Characteristics that distinguish these programs from non-Magnet programs were also described. To gather program implementation information, personal interviews of Magnet coordinators and site visits of all elementary and middle school campuses were conducted. Brochures and campus program summaries were also provided by the campus staff and the Bureau of Enrichment. Generally, groups of four to seven Magnet coordinators were interviewed at one time. All coordinators were asked to attend these meetings.[2] For the specialty high school program descriptions, each coordinator was interviewed individually. These interviews took place in either the Department of Research and Evaluation or the Department of Vocational Education/Enrichment Programs from November 1990 through April 1991. After the descriptions of the programs were drafted, copies were distributed to each coordinator for approval and editing. The intent of this process was to formulate accurate descriptions of the Magnet programs as they were being implemented at the campuses. Of particular interest were the academic characteristics of the programs (i.e. what courses and academic benefits were being offered to students enrolled in these Magnet programs).

Findings

Program Types

Organizationally, there are three basic types of Science/Math Magnet programs in HISD: School-Within-A-School programs, Add-On Programs, and Separate and Unique Schools. A School-Within-A-School (SWAS) program is one in which a subset of the student population attending a school is served by the Magnet program at that campus. All students in these programs, including those who are already zoned to the host school, must apply for admission to the program through the Magnet application process. An Add-On Program (AOP) is one in which the Magnet specialty is added to the regular school curriculum; the programs at these schools serve

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1 This research question was answered while preparing the *1990–91 HISD Magnet School Program Description* released from the HISD Department of Research and Evaluation on June 24, 1991. The information presented here is summarized from that report.

2 The program at Red Elementary School was without a coordinator at the scheduled interview time; the coordinator was later interviewed by telephone and during a site visit. The coordinator at Revere Middle School was on a field trip at the time of the scheduled interview; this coordinator was subsequently interviewed during a site visit.

the entire student population of that school. There are some schools that feature a School-Within-A-School program in addition to an Add-On Program. A Separate and Unique School (SUS) provides a unique curriculum and single educational focus for all students in the school. All students in a Separate and Unique School are transfer students; there is no home zoned school population. Each Magnet program has a Magnet coordinator and clerk that handle the admissions and student transfers and are responsible for documentation of objectives and other administrative duties.

General Enrollment Criteria for Magnet Schools and Programs

All students applying for admission to a Magnet program must meet the general enrollment criteria. Some programs have additional academic requirements for admission. These requirements are listed with the summary of the individual programs below. The common enrollment criteria for each Magnet program require a student to: 1) have an interest in the program, 2) complete an application, and 3) have an acceptable attendance and conduct record. An Entrance Agreement which defines expectations of the program must be signed by the parent, student, coordinator, and principal. Further, students are enrolled only on the availability of tri-ethnic space, which means that each program purposes to maintain an enrollment consisting of 65% minority students and 35% "other" students for most programs. In-Town Consortium programs must maintain a 60% minority, 40% "other" ethnic balance. Hispanic and Black students are included in the minority category; Asian, American Indian, and White students are included in the "other" category. In School-Within-A-School (SWAS) programs, enrollment must strictly follow these guidelines. In these programs, each student, including those who are zoned to the school where the program is located, is admitted to the program through the Magnet application process. After July 1 of each year, coordinators may accept students regardless of ethnicity; ten percent of the vacancies, however, must be reserved for students of the ethnicity that has not reached its goal. In the case of Add-On Programs (AOP), in which an entire school (along with its entire local student population) has been designated as a Magnet school, students meeting the general criteria may transfer into the school if their enrollment will bring the total school enrollment closer to the desired ethnic balance. Students from outside HISD may transfer to Magnet programs through the Volunteer Interdistrict Education Plan (VIEP).

Goals and Objectives

As Magnet programs, the Science/Math programs have the same general goals and objectives as all HISD Magnet programs. There are six goal areas with corresponding objectives that each Magnet school or program are required to meet. These goal areas concern enrollment and ethnicity, parental involvement, program recruitment and awareness, instructional support provided by the Magnet coordinators, and multicultural awareness. Each campus also has its own unique program specialty objectives which relate to specific course offerings. Coordinators maintain and submit documentation to the program director at the end of each year to show that these objectives have been met.

The following is a list of the Science/Math Magnet programs included in this evaluation. The program types and goal enrollments for 1990–91 are also included.

Elementary School Programs

School	Type	Goal	School	Type	Goal
Berry	AOP	993	MacGregor * †	AOP	500
Cornelius	SWAS	270	Pugh	AOP	838
Elrod	AOP	987	Red	SWAS	100
Lantrip	SWAS	136	Ross	SWAS	136
Law	AOP	497	Wainwright	SWAS	175
Lockhart †	AOP	620	West University	AOP	1176

Middle School Programs

School	Type	Goal
Clifton †	SWAS	500
Fondren	SWAS	450
Hartman	SWAS	300
Revere	SWAS	250

High School Programs

School	Type	Goal
High School for Health Professions *	SUS	750
Milby Science Institute	SWAS	375
Reagan Computer Technology †	SWAS	300
Sterling Aviation Sciences	SWAS	200
Washington, Engineering Professions	SWAS	450

Schools designated by a (*) indicate In-Town Consortium schools. Schools designated by a (†) indicate that more than one Magnet program is operated on this campus.

Program Budget

Each campus is allocated a budget for supplies and materials based on the program enrollment and program type. For 1990–91, the total supplies and materials budget for all Magnet Science/Math programs was $156,147.[3] For Add-On Programs, the number of students for funding purposes is based on the previous year's TEA Fall Survey, in this case, the TEA Fall Survey of October 1989. These numbers are adjusted yearly. For SWAS programs, funding is based on the enrollment goals. If a program consistently shows an actual enrollment different than

[3] Additional funds are allocated for other expenditures such as transportation and equipment purchases/repair. These funds are allocated for the entire HISD Magnet School Program. It is impossible to estimate the proportion of these funds that are used for Science/Math programs alone.

that of the goal, enrollment goals are adjusted as needed. Elementary schools with an AOP only receive a supply budget of $12 per student. For schools with a SWAS program only, the supply budget is $25 per SWAS program student. Elementary schools having both an Extended Instructional Day SWAS program and an AOP receive $25 per SWAS program student and $12 per student for the remainder of the students. The SUS campus of the High School for the Health Professions receives $10 per student for supplies. Clifton Middle School and Reagan High School receive a supply budget of $30 per SWAS program student.

Program Descriptions

The following descriptions are summaries of the Magnet programs as they were actually being implemented at the campuses. The intent was to illustrate the similarities and differences of groups of programs. For the specialty high schools, individual summary descriptions are presented for each school or program.

Elementary Schools

There are twelve elementary schools that specialize in science, math, and/or computer enrichment. Of these, seven are Add-On Programs (AOP) and five are School-Within-A-School (SWAS) programs. Add-On Programs are featured at the following schools: Berry, Elrod, Lockhart, Law, MacGregor, Pugh, and West University. Cornelius, Lantrip, Red, Ross, and Wainwright elementary schools feature SWAS programs. The enrollment goal for the AOPS was 5,611 students during the 1990–91 school year. The goal enrollment for the SWAS programs was 817 students.

A common goal for these programs includes providing students with an enriched curriculum in science, math, and/or computers based on an instructional style that emphasizes a hands-on laboratory approach and developing problem solving and higher order thinking skills. These programs also strive to enhance students' interest in the specialty areas and increase their awareness of career opportunities in those fields. Computer literacy is an important component of most of these programs. The programs at most of these campuses feature well-equipped science and computer laboratories. There are also two specialty staff positions in most of these Magnet programs–science specialists and computer specialists. Each of the campuses feature from one to four science specialists, certified elementary teachers with a specific background in science. Most of the campuses feature one or two computer specialists as well. Science specialists and computer specialists instruct students at all levels in their respective laboratories from one to five times per week. Many individual classrooms are equipped with computers as well for reinforcement of basic skills and enrichment activities. Science and computer applications are integrated across the curriculum at these schools. The math curriculum at most of these schools focuses on an enriched curriculum; supplemental manipulatives and floating modules are available to the teachers for math instruction in the classroom. At some campuses with a SWAS program, there is little distinction between the curriculum and activities for Magnet and non-Magnet students; the two groups benefit equally from the specialist staff and equipment. In others, the Magnet program participants are instructed separately from non-participants, but the specialty equipment is available for use in non-Magnet classrooms. At campuses where the Magnet program is an AOP, all students usually

participate equally in the enrichment activities offered at that school. Visiting speakers, field trips, and participation in science or other project-oriented fairs are features at most programs as well.

Two elementary schools, Berry and Lantrip Schools of Environmental Sciences, have a different curricular focus than the other science, math, and computer programs. The goals of these two programs are to increase student awareness of the natural environment, to provide hands-on experiences in planting, growing, and harvesting garden vegetables, and to improve basic skills through integration of academic subjects and environmental studies.

Individual programs have been designed and implemented at the campus level; therefore, although there are similarities among the programs, they have been tailored to meet the needs of the students at individual campuses. Lockhart and MacGregor, for example, have additional Magnet programs available on their campuses. Lockhart and MacGregor both offer an Extended Instructional Day component, and MacGregor also specializes in music enrichment. Cornelius Math and Science Academy sponsors an annual school-wide Invention Convention. At Law Math and Science Academy, the Law Weather Station and the math lab are important distinguishing components of the program. In the Red Math and Science Program, Magnet students are integrated with non-Magnet students for all classes. The Magnet students, however, receive 90 minutes extra per week of math, science, or computers, rotating courses each six weeks. Students are also instructed in a separate math lab at this school. Pugh Science Technology Academy coordinates a mentor program with students from the High School for Engineering Professions in which students from Pugh visit the high school campus on a regular basis to work with their mentors. A partnership with Shell Oil Company brings in tutors once a week during the school year to Elrod Math and Science Academy. Math and science modules offered before school are unique to the program at Wainwright Elementary School. As a result of a recycling partnership between McDonalds and West University, monthly speakers are brought in to discuss different aspects of recycling; this partnership will also result in the donation of electronics equipment. Lantrip's and Berry's school-wide recycling projects reinforce the environmental theme at these campuses as well. In addition, Supplemental Instruction for Gifted, High-Achieving, and/or Talented Students (SIGHTS), a home school program offered through the Gifted and Talented Program, is available to qualifying students at Elrod Math and Science Academy, Lockhart Technology Academy, and Red and West University Math and Science Programs.

Enrollment Criteria, Elementary School Programs

The seven schools with AOPs are Berry School of Environmental Sciences, Elrod and Law Math and Science Academies, Lockhart Technology Academy, MacGregor Music and Science Academy, Pugh Science Technology Academy, and West University Math and Science Program. The enrollment criteria for three of these programs (Elrod, Law, and West University) require that, in addition to the general requirements for enrollment in Magnet programs, a student must have grade level performance both academically and on standardized achievement tests. Pugh Science Technology Academy requires that a student have acceptable performance academically. The other three programs (Berry, Lockhart, and MacGregor) have no additional requirements concerning a student's academic performance.

The five SWAS programs are Cornelius and Red Math and Science Programs, Lantrip School of Environmental Sciences, and Ross and Wainwright Science and Math Programs. The

enrollment criteria for these programs require that, in addition to the general requirements for enrollment in Magnet programs, a student must have grade level performance academically and on standardized achievement tests. Some of these programs require a student/parent interview while others consider students' scores on additional aptitude and attitude tests.

Middle Schools

There are four middle schools that specialize in science, math, and/or computers. These schools, Clifton, Fondren, Hartman, and Revere middle schools, offer School-Within-A-School (SWAS) programs. The 1990–91 enrollment goal for these SWAS programs was 1,500 students. A common goal for these four SWAS programs includes providing students with an enriched curriculum in science, math, and computers based on an instructional style that emphasizes a hands-on laboratory approach and developing problem solving and higher order thinking skills. These programs also strive to enhance students' interest in the specialty areas and increase their awareness of career opportunities in these fields. Computer literacy is an important component of each of these programs. The Pre-International Baccalaureate Program, an honors program, is offered to qualifying students at all four of these middle schools.

In these SWAS programs, students may choose a science, math, or computer elective each semester. There are generally two different electives, such as Exploratory Science, Number Sense, or Computer Lab, offered at each grade level. In the science classes, students spend more than the state-required 40% of their instructional time in the laboratory. Science and math teachers are encouraged to use the computer labs whenever possible. In most of the programs, teachers are encouraged to teach interdisciplinary units; at some schools, a single topic is integrated into each class and the teachers grade one central student project. Specialty equipment available for the SWAS program is also available to non-Magnet teachers for use in their classrooms. Students may participate in enrichment activities such as Odyssey of the Mind or Future Problem Solving. Students may participate in field trips each semester. In most of the programs, students are required to participate in project-oriented activities such as the History Fair, the Technology Fair, and the Science and Engineering Fair.

Enrollment Criteria, Middle School Programs

The enrollment criteria for these SWAS programs require that, in addition to the general requirements for enrollment in Magnet programs, a student must have above average academic performance and grade level performance in science and math on standardized achievement tests. A student interview or student written letter is also part of the enrollment criteria for these programs.

High School for Engineering Professions, B. T. Washington High School

The High School for Engineering Professions is a School-Within-A-School program, located on the campus of Booker T. Washington High School. This program has an enrollment goal of 450 students. Students attend seven classes per day rather than the typical six; the school day runs from 8:00 a.m. to 4:15 p.m. All students in the program pursue the advanced with honors high school transcript. In this program, all students must enroll in science and math each year. A four-

semester sequence of computer science is also completed, generally one semester each year. Magnet students are clustered together for their academic courses, all taught at the honors level. Specialty electives are open to non-Magnet students on a space available basis. In the ninth grade, Magnet students generally select Engineering Lab A which includes units on robotics, aerodynamics, pneumatics, and engineering stresses. All ninth grade students are required to participate in the Science and Engineering Fair. In the tenth and eleventh grade years, students continue to enroll in science, math, computer science, and select other electives as required. Many students enroll in technical writing, a program requirement during the eleventh grade year. Students must select one fine arts course and two years of foreign language courses as electives to satisfy the advanced transcript requirements. In their twelfth grade year, students enroll in Engineering Lab B and C, both one-semester courses. Engineering Lab B is a special projects course coordinated with the technical writing course; Engineering Lab C focuses on electronics. Graphics and Architecture are two additional specialty electives that are offered to Magnet students. Many of the eleventh and twelfth grade students are offered engineering internships with area companies during the summer, and many of these students maintain this employment while continuing their education at the university level.

To be considered for enrollment in the High School for Engineering Professions, besides meeting the general criteria for all Magnet programs, students must also write an essay and have satisfactory performance on the Differential Aptitude Test (DAT). A personal interview must be conducted between an administrator of the Magnet program and the student and his or her parent(s). Students' grade averages, particularly in science and math, and their performance on the DAT and other standardized tests, such as the MAT6, are also considered for admission to the program.

High School for The Health Professions

The High School for the Health Professions (HSHP) is a Separate and Unique School that has an enrollment goal of 750 students. Students attend seven classes per day rather than the typical six; the school day runs from 8:00 a.m. to 3:00 p.m. All HSHP students pursue the advanced or advanced with honors high school transcript. Students select one fine arts course, two years of foreign language courses, and a computer science course as electives to satisfy the advanced transcript requirements. In the ninth grade, students enroll in Health Science Orientation, an introductory course of the health care system and its professionals. Tenth grade students attend Health Care Science and learn anatomy, physiology, and CPR. Health Occupations I is offered in the eleventh grade exposing students to patient care, medical laboratory, and dental science. In grade twelve, the curriculum includes physiology, histology, immunohematology, virology, clinical chemistry, and the Preceptorship Program. During the twelve-week Preceptorship Program, students receive health care training at Baylor College of Medicine, the University of Texas Health Science Center, the University of Texas Dental Branch, University of Houston School of Optometry, or Texas Southern University School of Pharmacy.

The enrollment criteria for the High School for the Health Professions, besides the general criteria for all Magnet programs, include a grade average of 80% or better, grade level performance

on the MAT6 or an equivalent standardized test, recommendation from a science or math teacher and a principal, counselor, or Magnet coordinator,[4] and a written statement of interest by the student. Students must also be administered the Developing Cognitive Abilities Test (DCAT), and a personal interview may be conducted between the entrance committee and the student. The High School for Health Professions is an In-Town Consortium school; therefore, the ethnicity goal is 60% minority, 40% other.

Milby Science Institute

The Milby Science Institute, a comprehensive program in the natural sciences and computer science for college bound students, is a SWAS program that has an enrollment goal of 375 students. The Magnet program at Milby is in transition from the former Petrochemical Institute to the Science Institute. All students in the Magnet program pursue the advanced or advanced with honors high school transcript. In the ninth, tenth, and eleventh grade years, students enroll in a course sequence which includes Integrated Science I, II, and III. Each year, the curriculum focuses on one of three disciplines (I - Biology, II - Chemistry, III - Physics), but stresses the relationship among the primary discipline to the other two. This course is a combined classroom/laboratory course that meets for two hours per day. All students are required to enroll in four years of math, and in the tenth grade, students enroll in a computer math/programming course. In addition, all students are required to enroll in two years of German during their tenth and eleventh grade years. In the twelfth grade, students choose courses related to advanced chemistry. Students also generally enroll in a fine arts elective at this time to satisfy the advanced transcript requirements. Also during the twelfth grade year, students may opt for enrollment in an Internship Program. Students are placed in research laboratories at area companies. Students receive one credit while they work, generally about twenty hours per week, and are paid while participating in the Internship Program. Honors and non-honors level academic courses are available for the Magnet participants at Milby Science Institute. High achieving non-Magnet participants are enrolled in academic courses with the Magnet participants. Specialty courses, however, are exclusively for Magnet participants.

The enrollment criteria for the Science Institute program, besides the general criteria for all Magnet programs, include a grade average of 80% or better in all courses and acceptable performance on standardized tests. Acceptance into the program is also based on a student/parent interview with an administrator of the program.

Reagan High School, Computer Technology

The Reagan High School for Computer Technology is a School-Within-A-School program with an enrollment goal of 300 students. Students in this program choose from one of four major fields of specialization: computer programming, business data processing, banking and finance, or computer maintenance technology. To specialize in computer programming, students must demonstrate a strong background in math. In the ninth grade, all students take the same courses

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[4] The recommendations will not be an admissions requirement for the 1991-92 school year.

which include a computer graphics and a microcomputer applications course. In the tenth grade, students enter a specialty from the four areas and generally pursue one or two electives per year that are prescribed for the specialty area. Students pursuing computer programming, for example, enroll in Computer Math I; business data processing students enroll in Business Information Processing; banking students enroll in Business Financial Applications; and computer maintenance students enroll in Manufacturing Graphics. Computer programming students continue to enroll in Computer Science, Computer Math, and Business Computer Programming as electives. Business data processing students enroll in Computer Math and Business Computer Applications I and II. Students in Banking and Finance continue to enroll in Business Law, Entrepreneurship, and Financial Services Marketing. Computer Maintenance students enroll in Computer Maintenance Technician I and II, both two-hour courses. Students may also enroll in courses designed for specialty areas other than their declared area as scheduling of electives permits. In the academic areas, honors and non-honors courses are available. Most students in the program pursue the advanced or advanced with honors high school transcript. To schedule all needed courses, students in the SWAS program attend seven courses rather than the typical six courses per day.

The enrollment criteria for the computer technology program, besides the general criteria for all Magnet programs, include a high interest in computer technology, an overall 75% or better grade average, and acceptable performance on standardized tests.

Sterling Aviation Sciences

Sterling Aviation Sciences is a School-Within-A-School Magnet program with an enrollment goal of 200 students. In the ninth grade, all Magnet students enroll in History of Aviation and Meteorology, both one-semester courses. In the eleventh and twelfth grade years, students enroll in Aviation/Aerospace I and II. During the first year course, students generally complete the ground school and examination requirements for an FAA Private Pilot's License. During the second year course, students receive training through flight simulators and up to 30 hours of actual flight lessons in a chartered Cessna 152 or 172 at no expense to the student. Students may obtain the FAA Recreational License which allows them to pilot a plane with non-paying passengers during the day time following 30 hours of dual and solo flight. These flight hours credit toward a Private Pilot's License which requires a minimum of 40 dual and solo flight hours. All students in the program are eligible to pursue the advanced or advanced with honors high school transcript. During the tenth, eleventh, and twelfth grade years, students enroll in two years of foreign language, computer science, and a fine arts course to satisfy the advanced transcript requirements. Honors and non-honors level academic courses are available to the Magnet students.

The enrollment criteria for the Aviation Sciences program, besides the general criteria for all Magnet programs, include an academic course grade average of 75% or better, grade level performance on standardized tests, and a score of 70% or better on the Differential Aptitude Test.

Question 2 What were the number and characteristics of the students that were served during the 1990–91 school year by the Magnet programs that provide an enriched curriculum in science, math, and/or computers?

Method

Information concerning the student enrollment and ethnicity for each of the Magnet schools and programs was obtained from the HISD Student Master File. Data for the AOPs and SUS campuses were as of April 27, 1991. Data for the SWAS programs were as of June 18, 1991. Information regarding ethnicity was examined to evaluate if each school or program reached the 1990–91 ethnicity goals.

Findings

Tables 1, 2, 3, and 4 illustrate the student enrollment for all HISD Magnet schools and programs, Add-On Programs, Separate and Unique Schools, and School-Within-A-School programs that have a curriculum that focuses on enrichment in science, math, and/or computers. The data presented in the tables are by percent of the individual program enrollment both for specific ethnic groups and total minorities. Those programs that reached the 1990–91 ethnicity goals are designated in the tables. In-Town Consortium schools must maintain a 60% minority, 40% "other" balance,[5] satellite schools must maintain a 65% minority, 35% "other" balance. For SWAS programs and SUS campuses, the goal is considered reached if the percentages are within 10% of the desired goal. For AOPs, a program is considered to have reached its goal if the ethnicity of the program for 1990–91 is either maintained or improved with respect to the 1989–90 school year.

Table 1. Student Enrollment in All Science/Math/Computer Magnet Programs, Spring 1991

	Black		Hispanic		Total Minority	Other		Total
	N	%	N	%	%	N	%	N
Elementary	2,653	41.6	2,167	34.0	75.6	1,552	24.4	6,372
Middle	495	36.2	408	29.8	66.0	465	34.0	1,368
Senior	681	37.1	629	34.3	71.4	524	28.6	1,834
Total	*3,829*	*40.0*	*3,204*	*33.5*	*73.5*	*2,541*	*26.5*	*9,574*

5 Black and Hispanic students are considered minority students; Students who are White, Asian, American Indian, or of any other ethnic origin are considered "other".

Table 2. Student Enrollment in Science/Math/Computer Magnet Add-On Programs, Spring 1991

	Black		Hispanic		Total Minority	Other		Total
	N	%	N	%	%	N	%	N
ELEMENTARY								
Berry	172	16.1	848	79.5	95.7	46	4.3	1066
Elrod	574	67.7	92	10.8	78.5	182	21.5	848
Law ‡	474	92.0	11	2.1	94.2	30	5.8	515
Lockhart	649	93.9	8	1.2	95.1	34	4.9	691
* MacGregor ‡	301	59.7	139	27.6	87.3	64	12.7	504
Pugh	8	1.0	738	94.9	95.9	32	4.1	778
* West University	120	10.7	101	9.0	19.7	898	80.3	1,119
Total Add-On	*2,298*	*41.6*	*4,937*	*35.1*	*76.7*	*1,286*	*23.3*	*5,521*

* In-Town Consortium Magnet Schools: 60% Minority/40% Other
Satellite Magnet Schools: 65% Minority/35% Other
‡ Indicates the schools or programs that reached the 1990–91 ethnicity goal.

Table 3. Student Enrollment in Magnet Science/Math/Computer Separate and Unique Schools, Spring 1991

	Black		Hispanic		Total Minority	Other		Total
	N	%	N	%	%	N	%	N
SENIOR								
Health Professions ‡	322	46.3	123	17.7	64.0	250	36.0	695
Total SUS	*322*	*46.3*	*123*	*17.7*	*64.0*	*250*	*36.0*	*695*

* In-Town Consortium Magnet Schools: 60% Minority/40% Other
Satellite Magnet Schools: 65% Minority/35% Other
‡ indicates the schools or programs that reached the 1990–91 ethnicity goal.

Table 4. Student Enrollment in Magnet Science/Math/Computer School-Within-A-School Programs, Spring 1991

	Black		Hispanic		Total Minority	Other		Total
	N	%	N	%	%	N	%	N
ELEMENTARY								
Cornelius ‡	107	36.9	72	24.8	61.7	111	38.3	290
Lantrip ‡	33	24.1	62	45.3	69.3	42	30.7	137
Red ‡	55	55.6	10	10.1	65.7	34	34.3	99
Ross	102	76.7	25	18.8	95.5	6	4.5	133
Wainwright ‡	58	30.2	61	31.8	62.0	73	38.0	192
Subtotal	*355*	*41.7*	*230*	*27.0*	*68.7*	*266*	*31.3*	*851*
MIDDLE								
Clifton ‡	155	34.9	133	30.0	64.9	156	35.1	444
Fondren ‡	147	38.3	81	21.1	59.4	156	40.6	384
Hartman	133	45.9	93	32.1	77.9	64	22.1	290
Revere ‡	60	24.0	101	40.4	64.4	89	35.6	250
Subtotal	*495*	*36.2*	*408*	*29.8*	*66.0*	*465*	*34.0*	*1,368*
SENIOR								
Milby	41	10.4	274	69.5	79.9	79	20.1	394
Reagan	60	22.2	146	54.1	76.3	64	23.7	270
Sterling ‡	44	33.8	25	19.2	53.1	61	46.9	130
Washington	214	62.0	61	17.7	79.7	70	20.3	345
Subtotal	*359*	*31.5*	*506*	*44.4*	*75.9*	*274*	*24.1*	*1,139*
Total SWAS	*1,209*	*36.0*	*1,144*	*34.1*	*70.1*	*1,005*	*29.9*	*3,358*

* In-Town Consortium Magnet Schools: 60% Minority/40% Other
Satellite Magnet Schools: 65% Minority/35% Other

‡ Indicates the schools or programs that reached the 1990-91 ethnicity goal.

Table 5 shows the 1990–91 attendance rates of students enrolled in Magnet schools or programs. For elementary level AOPs, the average rate of attendance was 94.3%. For elementary and middle school SWAS programs, the average rate of attendance was 97.1% and 96.2%, respectively. For high school programs, the average rate of attendance was 96.4%. These values may be compared to HISD's overall district average attendance rate for 1990–91 of 91.7%.

Table 5. Attendance Rates of Science/Math Magnet Students, 1990–91

Program or School	Attendance Rate, %
Elementary, AOP	
Berry	92.5
Elrod	94.0
Lockhart	94.2
Law	94.0
MacGregor	94.5
Pugh	94.4
West University	96.2
Average	*94.3*
Elementary, SWAS	
Cornelius	96.8
Lantrip	97.0
Red	97.4
Ross	96.9
Wainwright	97.2
Average	*97.1*
Middle Schools, SWAS	
Clifton	97.4
Fondren	95.6
Hartman	96.6
Revere	95.2
Average	*96.2*
High Schools	
Engineering Professions	97.2
Health Professions	96.3
Milby Science Institute	95.2
Reagan Technology	96.3
Sterling Aviation Sciences	97.0
Average	*96.4*

Question 3 How did the academic achievement level of students participating in Science/Math programs during the 1990–91 school year compare with that of students not participating in Magnet programs?

Method

To evaluate the academic achievement of students who had been enrolled in Science/Math Magnet programs, the following procedure was followed. For each Magnet elementary school with an Add-On Program, a non-Magnet elementary school was identified that matched the demographic characteristics of the Magnet school. Schools were matched based on the ethnicity of the students, percent of the population qualifying for free or reduced lunch, and number of students. In addition, Magnet schools with SIGHTS programs were matched with non-Magnet schools with SIGHTS programs. Only the scores of fifth graders who had been enrolled in these schools since the first grade were used in the analysis. Standardized achievement test scores were obtained and compared for these students from their first (1986–87), third (1988–89), and fifth (1990–91) grade years.

For elementary level SWAS programs, the fifth grade students who had been enrolled in the program for the past five years were identified. For middle school SWAS programs, eighth grade students who had been enrolled in the program since the sixth grade were identified.[6] In the analysis for both the elementary and middle school programs, the Magnet students were matched with a sample of non-Magnet HISD students who were selected from the schools to which the Magnet students were zoned. Information regarding the home schools from which SWAS students transferred was obtained from the Bureau of Student Transfer. For each SWAS program, three to seven schools were selected from which to generate matched samples. These schools were the home schools from which the greatest proportion of students had transferred. To generate the matched samples, non-Magnet students[7] from the selected schools were identified using the same criteria as Magnet students regarding length of time enrolled in the school. From these students, samples were randomly selected from the students who matched the ethnicity and SES characteristics of the Magnet samples. Gifted and talented students were ineligible to be selected. When possible, matched students were selected from the home schools in the same proportion that the school was represented in the SWAS sample.

An analysis of variance (ANOVA) was used to compare the standardized achievement test scores (MAT6) of the Magnet student samples and the matched samples. For the elementary school samples, the covariates (pre-test measures) were the first grade MAT6 scores. The dependent variables (post-test measures) in the analyses were the students' third or fifth grade MAT6 scores. This statistical analysis takes into account differences between the Magnet and comparison samples at the first grade level for elementary programs or the fifth grade level for

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6 Revere Middle School was excluded from this analysis as the SWAS program was not formally implemented until the 1990–91 school year.

7 Some students from Clifton Middle School who were enrolled in the Add-On-Program were selected for the comparison group for the SWAS program. All students at Clifton are part of the Add-On-Program; admissions to the program is not based on academic achievement.

middle school programs. Although first grade MAT6 scores for the elementary school programs represent a pre-test measure of academic achievement gathered after the students had already participated in almost eight months of the programs, these were the first available standardized achievement test data for the elementary samples. For the middle school samples, the students' fifth grade scores were used as the covariates (pre-test measures) in the analysis. The fifth grade scores were a measure of academic achievement gathered approximately two months of school prior to entering the middle school Magnet or comparison programs. The dependent variables (post-test measures) in these cases were the sixth and eighth grade MAT6 scores. MAT6 scores for all individual and composite tests were examined. The results of the comparisons regarding the science, total math, and the complete battery composite scores are reported here. Results of the comparisons of the social studies, total reading, and total language scores are presented in Appendix 1.[8]

The analyses of academic achievement was limited to the elementary and middle school programs. Although there are five high school programs that offer an enriched curriculum in science, math, and/or computers, standardized measures of achievement were not available in these areas at the terminal high school years. Standardized achievement tests (MAT6) in the areas of science and math are administered only through the ninth grade. Although the 1990-91 twelfth grade students in these Magnet programs would have taken the TEAMS tests in the ninth and eleventh grades, TEAMS is a test of basic skills. No tests are currently administered that measure achievement in computers.

Findings

Tables 6 through 13 show the data concerning the analysis of the academic achievement of students participating in the Science/Math Add-On Programs at the elementary level. Tables 14 through 21 show the data concerning the analysis of the academic achievement of students participating in the Science/Math SWAS programs at the elementary and middle school levels. The tables present the adjusted mean MAT6 scores on the science test, total math, and the complete battery for Magnet students and the matched comparison groups. Although enrichment in computers is part of the curriculum in most of these programs, there are no standardized data available to determine the efficacy of the programs in this area. In the tables, the F value is a ratio that indicates the magnitude of the difference between the adjusted mean scores of the two samples. An accompanying p value of $\leq .05$ indicates a statistically significant difference between the two adjusted scores. The smaller the p value, the greater the difference between the scores. It should also be noted that depending on the sample size, similar differences between adjusted mean scores may be statistically significant in one case, but not in another. The larger the sample sizes, the smaller the difference that will be considered significant. As an illustration, the students at Ross Elementary School scored 4.6 points higher (adjusted means) than the matched sample on the total math test during the 1988–89 school year, and the students at Fondren Middle School scored 4.4

[8] The total math score is a composite of the three math subtests: computation, math concepts, and problem solving. The total language score is a composite of the spelling and word recognition subtests. The total reading score is a composite of the vocabulary and reading comprehension subtests. The complete battery score is a composite of all subtests in math, reading, language, science, social studies, and research skills.

points higher (adjusted means) than the matched sample on the total math test during 1990–91. Statistically speaking, the performance of the Ross students (sample sizes of 11 and 12) was not statistically significantly different than the match, while the performance of the Fondren students (sample sizes of 117 and 125) was. The statistical tests performed should in no way detract from the fact that the Magnet students in the samples scored approximately 4.5 points higher than the students in the matched samples. However, the lack of statistical significance in the Ross example indicates that the same difference may not be observed with other similarly sized samples from the populations (i.e. there is a greater probability that the difference in adjusted test scores was due to chance selection of the students, rather than any *bona fide* difference).

Elementary Level Programs

Table 6 shows some of the demographic characteristics of the Magnet elementary level Add-On Programs and the matched comparison schools.

Table 6. Characteristics of Magnet Elementary School Add-On Programs and Matched Comparison Schools

School Name	Type	Total Students	Ethnicity		% Free or Reduced Lunch	SIGHTS[9]
			% Minority	% Other		
West Univ.	Magnet	1127	19.6	80.4	7.7	yes
Ashford	non-Magnet	1016	15.2	84.8	5.5	yes
Pugh	Magnet	767	95.7	4.3	87.5	no
Pilgrim	non-Magnet	724	96.0	4.0	90.0	no
Berry	Magnet	1028	96.3	3.7	89.4	no
Braeburn	non-Magnet	1025	94.3	5.7	91.4	no
Elrod	Magnet	870	76.9	23.1	64.1	self-contained
Bonham	non-Magnet	1098	70.9	29.1	53.9	self-contained
MacGregor	Magnet	499	87.4	12.6	61.3	no
Petersen	non-Magnet	463	95.5	4.5	78.8	no
Law	Magnet	491	96.1	3.9	81.9	no
Osborne	non-Magnet	531	98.1	1.9	76.4	no
Lockhart	Magnet	701	94.4	5.6	73.7	self-contained
Kelso	non-Magnet	663	98.9	1.1	80.7	self-contained

9 SIGHTS: Supplemental Instruction for Gifted, High-Achieving, and/or Talented Students

West University Elementary School Add-On Program

Table 7 shows the comparison of the adjusted means of standardized achievement tests for samples from West University (Magnet AOP) and Ashford elementary schools (non-Magnet comparison). An average of 73 and 62 fifth grade students, respectively, were identified who had MAT6 data available and who had been continuously enrolled at West University and Ashford since the first grade. Generally, the students in the West University sample out-performed the students in the Ashford sample. Statistically significant differences were found not only in total math and the complete battery of tests (shown), but also in the areas of social studies, total reading, and total language (see Appendix 1). The statistical analysis of the data indicated that there were no significant differences between the adjusted mean science test scores of the samples at West University and Ashford elementary schools. However, the students at West University did score an average of 4.3 points higher on the science tests in the years shown. Comparing the adjusted mean test scores in total math, the 1990–91 fifth grade students in the sample from West University scored 9.7 points higher than the comparison group when the students were in the third grade (1988–89) after three years in the program and 14.8 points higher during the 1990–91 school year after five years in the program. The students in the West University sample also scored an average of 7.7 points higher than the comparison group on the complete battery of tests.

Table 7. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	West University (Magnet)	Ashford (non-Magnet)	*F*
Science			
88–89	76.9 (74)	73.5 (63)	n.s.
90–91	76.2 (71)	71.1 (62)	n.s.
Total Math			
88–89	78.6 (76)	68.9 (63)	18.53***
90–91	86.0 (74)	71.2 (61)	37.61***
Complete Battery			
88–89	78.6 (71)	71.2 (62)	17.27***
90–91	81.3 (69)	73.4 (60)	17.14***

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p≤.01, *** p≤.001

Pugh Elementary School Add-On Program

Table 8 shows the comparison of the adjusted means of standardized achievement tests for samples from Pugh (Magnet AOP) and Pilgrim (non-Magnet comparison) elementary schools. An average of 53 and 10 fifth grade students, respectively, were identified who had MAT6 data available and who had been continuously enrolled at Pugh and Pilgrim during the past three years. Due to the small number of students identified who had been enrolled at Pilgrim Elementary School since the first grade and who had MAT6 scores available for the analysis (N=3), the criteria were changed for this case to select those students who had been enrolled since the third grade. The small number of students eligible for the analysis may be in part be to the low number of students who actually took the MAT6 at that school. In 1991, only 35% of the students at Pilgrim took the MAT6 compared to 60% of the students at Pugh. Since the covariates (pre-test measures) in this case were the second grade MAT6 scores, students' scores were equalized based on data gathered prior to entering the treatments in the third grade. This analysis, then, evaluates the effects of three years of enrollment in the two schools.

The statistical analysis of the data indicated that there were no significant differences between the science test scores of the students at Pugh and Pilgrim elementary schools. During the 1988–89 school year, the current fifth grade students at Pilgrim (non-Magnet) who were in the third grade in 1988–89 scored significantly higher than the students at Pugh (Magnet) on the MAT6 total math test and complete battery. For the 1990–91 school year, however, the differences between the adjusted means for the total math test and complete battery were not statistically significant.

Table 8. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Pugh (Magnet)	Pilgrim (non-Magnet)	*F*
Science			
88–89	49.7 (52)	53.6 (10)	n.s.
90–91	55.0 (55)	51.7 (10)	n.s.
Total Math			
88–89	52.6 (52)	62.7 (10)	7.97**
90–91	62.1 (53)	60.9 (10)	n.s.
Complete Battery			
88–89	49.8 (51)	56.8 (10)	4.54*
90–91	57.0 (53)	58.7 (10)	n.s.

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p≤.01, *** p≤.001

Berry Elementary School Add-On Program

Table 9 shows the comparison of the adjusted means of standardized achievement tests for samples from Berry (Magnet AOP) and Braeburn (non-Magnet comparison) elementary schools. An average of 56 and 17 fifth grade students, respectively, were identified who had MAT6 data available and who had been continuously enrolled at Berry and Braeburn since the third grade. Due to the small number of students identified who had been enrolled at Braeburn Elementary School since the first grade and who had MAT6 scores available for the analysis (N=9), the criteria were changed for this case to select those students who had been enrolled since the third grade. The small number of students eligible for the analysis may be in part be to the low number of students who actually took the MAT6 at that school. In 1991, only 32% of the students at Braeburn took the MAT6 compared to 50% of the students at Berry. Since the covariates (pre-test measures) in this case were the second grade MAT6 scores, students' scores were equalized based on data gathered prior to entering the treatments in the third grade. This analysis, then, evaluates the effects of three years of enrollment in the two schools.

The statistical analysis of the data indicated that in the 1988–89 school year, there were no significant differences between the science or complete battery test scores of the samples at Berry and Braeburn elementary schools. In the area of science, however, the students at Berry did score 3.3 points higher than the comparison group during the 1990–91 school year. For the 1990–91 school year, the data indicated that the students at Berry performed significantly higher on the complete battery of MAT6 tests than the matched comparison sample of students from Braeburn. This may be attributed to the fact that the students at Berry scored significantly higher in the area of reading and higher (though not significantly so) in the areas of math, social studies, and language. The 1990–91 data indicated, however, that the students did not score significantly higher in the area of science. The Magnet program at Berry is substantially different than the programs at the other schools; the program emphasizes the environmental sciences. As a formal math enrichment program is not part of the Magnet program, the comparison of the math test scores is not presented here. The math test score comparison is presented with the other test scores in Appendix 1.

Table 9. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Berry (Magnet)	Braeburn (non-Magnet)	*F*
Science			
88–89	48.3 (57)	44.0 (17)	n.s.
90–91	51.3 (57)	47.2 (17)	n.s.
Complete Battery			
88–89	48.4 (56)	42.4 (17)	n.s.
90–91	50.2 (56)	43.6 (17)	5.29*

Values in parentheses indicate the number of students in the analysis.
* p≤.05, **p ≤.01, *** p≤.001

Elrod Elementary School Add-On Program

Table 10 shows the comparison of the adjusted means of standardized achievement tests for samples from Elrod (Magnet AOP) and Bonham (non-Magnet comparison) elementary schools. An average of 25 and 32 fifth grade students, respectively, were identified who had MAT6 data available and who had been continuously enrolled at Elrod and Bonham during the past five years. The statistical analysis of the data showed that there were no significant differences between the science test or total math test scores of the samples at Elrod and Bonham elementary schools. The current fifth grade students at Bonham (non-Magnet) who were in the third grade in 1988–89, scored significantly higher than the students at Elrod (Magnet) on the MAT6 complete battery for the 1988–89 school year. By the 1990–91 school year, however, no significant difference was observed when comparing the complete battery scores. On the average, however, the students in the sample from Bonham did score an average of 4.5 points higher on the tests shown in the table than did the students in the sample from Elrod.

Table 10. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Elrod (Magnet)	Bonham (non-Magnet)	*F*
Science			
88–89	65.3 (25)	68.7 (34)	n.s.
90–91	64.4 (24)	67.1 (31)	n.s.
Total Math			
88–89	68.0 (26)	71.3 (34)	n.s.
90–91	71.0 (25)	77.0 (30)	n.s.
Complete Battery			
88–89	62.3 (25)	69.0 (33)	5.210*
90–91	69.3 (24)	74.0 (28)	n.s.

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p≤.01, *** p≤.001

MacGregor Elementary School Add-On Program

Table 11 shows the comparison of the adjusted means of standardized achievement tests for samples from MacGregor (Magnet AOP) and Petersen (non-Magnet comparison) elementary schools. An average of 29 and 25 fifth grade students, respectively, were identified who had MAT6 data available and who had been continuously enrolled at MacGregor and Petersen during the past five years. The statistical analysis of the data indicated that there were no significant differences between the science or total math test scores of the samples at MacGregor and Petersen elementary schools. During the 1988–89 school year, the current fifth grade students at Petersen who were in the third grade in 1988–89 scored significantly higher than the students at MacGregor on the MAT6 complete battery. For the 1990–91 school year, however, the difference between the adjusted means for the complete battery was not statistically significant.

Table 11. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	MacGregor (Magnet)	Petersen (non-Magnet)	*F*
Science			
88–89	46.2 (29)	53.6 (25)	n.s.
90–91	57.2 (28)	54.7 (25)	n.s.
Total Math			
88–89	47.7 (29)	49.0 (25)	n.s.
90–91	50.7 (28)	47.5 (25)	n.s.
Complete Battery			
88–89	42.0 (29)	53.0 (24)	11.06**
90–91	49.8 (28)	53.5 (25)	n.s.

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p≤.01, *** p≤.001

Law Elementary School Add-On Program

Table 12 shows the comparison of the adjusted means of standardized achievement tests for samples from Law (Magnet AOP) and Osborne (non-Magnet comparison) elementary schools. An average of 32 and 24 fifth grade students, respectively, were identified who had MAT6 data available and who had been continuously enrolled at Law and Osborne during the past five years. The statistical analysis of the data indicated that during the 1988–89 school year, the current fifth grade students at Osborne (non-Magnet) who were in the third grade in 1988–89 scored significantly higher than the students at Law (Magnet) on the science test, the total math test, and the MAT6 complete battery. By 1990–91, however, the differences between the mean adjusted test scores were not statistically significant.

Table 12. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Law (Magnet)	Osborne (non-Magnet)	*F*
Science			
88–89	53.2 (34)	68.4 (26)	7.52**
90–91	49.2 (34)	47.7 (24)	n.s.
Total Math			
88–89	58.7 (31)	71.0 (27)	7.36**
90–91	59.5 (31)	63.9 (25)	n.s.
Complete Battery			
88–89	53.5 (30)	63.1 (23)	4.16*
90–91	54.6 (30)	52.6 (21)	n.s.

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p≤.01, *** p≤.001

Lockhart Elementary School Add-On Program

Table 13 shows the comparison of the adjusted means of standardized achievement tests for samples from Lockhart (Magnet AOP) and Kelso (non-Magnet comparison) elementary schools. An average of 35 and 41 fifth grade students, respectively, were identified who had MAT6 data available and who had been continuously enrolled at Lockhart and Kelso during the past five years. The statistical analysis of the data indicated that during the 1988–89 school year, the current fifth grade students at Kelso (non-Magnet) who were in the third grade in 1988–89 scored significantly higher than the students at Lockhart (Magnet) on the science test and the MAT6 complete battery. By 1990–91, however, the differences between the mean adjusted test scores were not statistically significant. Although the students at Kelso scored higher than the students at Lockhart on the total math in both years examined, no significant difference was calculated between the scores.

Table 13. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Lockhart (Magnet)	Kelso (non-Magnet)	*F*
Science			
88–89	53.9 (35)	65.9 (42)	7.22**
90–91	55.0 (35)	53.6 (41)	n.s.
Total Math			
88–89	61.9 (35)	70.2 (43)	n.s.
90–91	55.7 (35)	59.3 (42)	n.s.
Complete Battery			
88–89	58.0 (34)	68.8 (39)	7.14**
90–91	58.6 (35)	55.1 (39)	n.s.

Values in parentheses indicate the number of students in the analysis.
* p≤.05, **p ≤.01, *** p≤.001

Wainwright Elementary School SWAS Program

Table 14 shows the data for the comparison between the students enrolled in the SWAS program at Wainwright Elementary School and the matched non-Magnet comparison sample. The students of the matched sample were selected from Wainwright (non-SWAS students), Stevens, Eliot, and Smith elementary schools. Unlike the other Science/Math programs, the program at Wainwright is designed for third through fifth grade students. In this case, the covariates in the analysis were the second grade scores (i.e. the students in the samples were equalized based on their second grade MAT6 scores). The statistical analysis of the data indicated that there were significant differences between the adjusted mean test scores in the areas of science, total math, and the complete battery during both the 1988–89 and 1990–91 school years. Comparing the adjusted mean test scores in science, the 1990–91 fifth grade students in the sample from Wainwright scored 31.5 points higher than the comparison group when the students were in the third grade (1988–89) after one year in the program and 15.1 points higher during the 1990–91 school year after three years in the program. In the area of math, the students in the Wainwright sample scored 22.9 points higher than the comparison group in 1988–89 and 14.4 points higher in 1990–91.

Table 14. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Wainwright (Magnet)	Match (non-Magnet)	*F*
Science			
88-89	84.8 (33)	53.3 (41)	67.85***
90–91	70.5 (33)	55.4 (41)	16.05***
Total Math			
88-89	79.9 (33)	57.0 (41)	45.12***
90–91	76.0 (33)	61.6 (41)	15.17***
Complete Battery			
88-89	75.5 (33)	57.4 (41)	32.18***
90–91	69.4 (33)	61.2 (41)	5.31*

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p≤.01, ***p≤.001

Red Elementary School SWAS Program

Table 15 shows the data for the comparison between the students enrolled in the SWAS program at Red Elementary School and the matched non-Magnet comparison sample. Because only six fifth grade students were identified as having been enrolled in the program since the first grade, the selection criteria were changed for this program. Students were selected for the analysis if they had been enrolled in the program since the third grade. Even with the change in selection criteria, only 12 students were identified for the analysis. A sample of this size is at the bottom limit with regard to being able to generalize the findings from this analysis to the entire program. In this analysis, the covariates were the second grade scores (i.e. the students in the samples were equalized based on their second grade MAT6 scores). The students of the matched sample were selected from Windsor Village and Montgomery elementary schools.

The statistical analysis of the data indicated that there were significant differences between the adjusted mean test scores in the areas of science, total math, and the complete battery during both the 1988–89 and 1990–91 school years. Comparing the adjusted mean test scores in science, the 1990–91 fifth grade students in the sample from Red scored 18.9 points higher than the comparison group when the students were in the third grade (1988–89) and 34.6 points higher during the 1990–91 school year. In the area of math, the students in the Red sample scored 16.4 points higher than the comparison group in 1988–89 and 37.3 points higher in 1990–91.

Table 15. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Red (Magnet)	Match (non-Magnet)	*F*
Science			
88–89	63.1 (12)	44.2(12)	5.29*
90–91	78.1 (12)	43.5 (12)	25.21***
Total Math			
88–89	73.8 (12)	57.4 (12)	6.71*
90–91	84.2 (12)	46.9 (12)	42.02***
Complete Battery			
88–89	61.8 (12)	51.8 (12)	4.27*
90–91	74.4 (12)	49.6 (12)	15.42***

Values in parentheses indicate the number of students in the analysis.

* p≤.05, ** p ≤.01, ***p ≤.001

Lantrip Elementary School SWAS Program

Table 16 shows the data for the comparison between the students enrolled in the SWAS program at Lantrip Elementary School and the matched non-Magnet comparison sample. The matched sample was generated from non-SWAS fifth grade students at Lantrip. The extent to which the results from this statistical analysis may be generalized is limited by the fact that the sample sizes were small (twelve students from Lantrip and eight students in the matched sample). The statistical analysis of the data indicated that there were significant differences between the adjusted mean science test scores of the Magnet and non-Magnet samples during both the 1988–89 and 1990–91 school years. Comparing the adjusted mean test scores in science, the 1990–91 fifth grade students in the sample from Lantrip scored 33.4 points higher than the comparison group when the students were in the third grade (1988–89) and 22.5 points higher during the 1990–91 school year. Significant differences were not found between the adjusted mean scores on the complete battery. As a formal math enrichment program is not part of this Magnet program, the comparison of the math test scores is not presented here. The math test score comparison is presented with the other test scores in Appendix 1.

Table 16. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Lantrip (Magnet)	Match (non-Magnet)	*F*
Science			
88–89	71.4 (12)	38.0 (8)	49.81***
90–91	67.8 (12)	45.3 (8)	10.34**
Complete Battery			
88–89	57.5 (9)	50.7 (7)	n.s.
90–91	62.1 (10)	57.7 (7)	n.s.

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p ≤.01, *** p ≤.001

Ross Elementary School SWAS Program

Table 17 shows the data for the comparison between the students enrolled in the SWAS program at Ross Elementary School and the matched non-Magnet comparison sample. The matched sample was generated from non-SWAS students at Ross. Eleven students from Ross were identified for this analysis. Samples of this size were at the bottom limit with regard to being able to generalize the findings from this analysis to the entire program. The statistical analysis of the data indicated that there were significant differences between the adjusted mean science test scores of the Magnet and non-Magnet samples during the 1990–91 school year. The students at Ross scored an average of 14.9 points higher than the comparison group on the science test in 1990–91. Significant differences were not found between the adjusted mean scores on the total math test or complete battery during the 1988–89 and 1990–91 school years.

Table 17. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Ross (Magnet)	Match (non-Magnet)	*F*
Science			
88–89	54.6 (11)	51.8 (12)	n.s.
90–91	63.3 (12)	48.4 (12)	6.98*
Total Math			
88–89	62.8 (10)	58.2 (12)	n.s.
90–91	64.3 (11)	68.5 (12)	n.s.
Complete Battery			
88–89	53.7 (10)	51.1 (12)	n.s.
90–91	58.5 (11)	58.0 (12)	n.s.

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p ≤.01, ***p ≤.001

Cornelius Elementary School SWAS Program

Table 18 shows the data for the comparison between the students enrolled in the SWAS program at Cornelius Elementary School and the matched non-Magnet comparison sample. The matched sample was generated from Lewis, Gregg, and Southmayd elementary schools. The statistical analysis of the data indicated that there were no significant differences between the adjusted mean test scores for science, total math, or the complete battery during either the 1988–89 and 1990–91 school years. Although the analysis did not indicate that the difference was statistically significant, the students at Cornelius scored an average of 9.7 points higher than the comparison group on the 1988–89 total math test. Total math scores are composites of subtests in math concepts, math computations, and math problem solving. During the 1988–89 school year, students at Cornelius did score significantly higher than did the comparison group on the math computations subtest (adjusted means=65.3 (Cornelius), 54.9 (matched group), $F=4.16$, $p \leq .05$) and on the math problem solving subtest (adjusted means=64.9 (Cornelius), 49.5 (matched group), $F=4.72$, $p \leq .05$).

Table 18. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Cornelius (Magnet)	Match (non-Magnet)	*F*
Science			
88–89	50.8 (15)	56.4 (20)	n.s.
90–91	51.7 (15)	51.0 (20)	n.s.
Total Math			
88–89	65.2 (16)	55.5 (20)	n.s.
90–91	59.9 (16)	57.1 (20)	n.s.
Complete Battery			
88–89	51.0 (15)	56.6 (20)	n.s.
90–91	51.5 (15)	57.4 (20)	n.s.

Values in parentheses indicate the number of students in the analysis.

Middle School Programs

Clifton Middle School SWAS Program

Table 19 shows the data for the comparison between the students enrolled in the SWAS program at Clifton Middle School and the matched non-Magnet comparison sample. The students of the matched sample were selected from Clifton (non-SWAS students), Hamilton, Black, Williams, McReynolds, Fonville, and Terrell middle schools. The covariates in the analyses were the fifth grade scores (i.e. the students in the samples were equalized based on their fifth grade MAT6 scores prior to entering the middle school program). The statistical analysis of the data indicated that there were significant differences between the adjusted mean test scores in the areas of science, total math, and the complete battery during both the 1988–89 and 1990–91 school years. Comparing the adjusted mean test scores in science, the 1990–91 eighth grade students in the sample from Clifton scored 5.8 points higher than the comparison group when the students were in the sixth grade (1988–89) after one year in the program and 6.0 points higher during the 1990–91 school year after three years in the program. In the area of math, the students in the Clifton sample scored 6.2 points higher than the comparison group in 1988–89 and 9.8 points higher in 1990–91.

Table 19. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Clifton (Magnet)	Match (non-Magnet)	*F*
Science			
88–89	66.7 (124)	60.9 (131)	14.52***
90–91	64.8 (124)	58.8 (131)	16.16***
Total Math			
88–89	71.5 (124)	65.3 (131)	17.1***
90–91	70.5 (124)	60.7 (131)	29.73***
Complete Battery			
88–89	67.6 (124)	65.0 (131)	7.25**
90–91	67.4 (124)	61.8 (131)	22.23***

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p ≤.01, ***p ≤.001

Fondren Middle School SWAS Program

Table 20 shows the data for the comparison between the students enrolled in the SWAS program at Fondren Middle School and the matched non-Magnet comparison sample. The students of the matched sample were selected from Fondren (non-SWAS students), Dowling, Welch, Long, Sharpstown, and Woodson middle schools. The covariates in the analyses were the fifth grade scores (i.e. the students in the samples were equalized based on their fifth grade MAT6 scores prior to entering the middle school program). The statistical analysis of the data indicated that there were significant differences between the adjusted mean test scores in the areas of science during both the 1988–89 and 1990–91 school years. Comparing the adjusted mean test scores in science, the 1990–91 eighth grade students in the sample from Fondren scored 5.5 points higher than the comparison group when the students were in the sixth grade (1988–89) after one year in the program and 5.4 points higher during the 1990–91 school year after three years in the program. In the area of math, although no significant difference was found between the scores of the students in the Fondren and matched samples during the 1988–89 school year, the students in the Fondren sample scored 4.4 points higher than the comparison group in 1990–91.

Table 20. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Fondren (Magnet)	Match (non-Magnet)	*F*
Science			
88–89	66.6 (117)	61.1 (125)	8.85**
90–91	64.5 (117)	59.1 (125)	9.01**
Total Math			
88–89	66.5 (117)	68.1 (125)	1.06
90–91	68.1 (117)	63.7 (125)	6.10*
Complete Battery			
88–89	66.6 (117)	65.0 (125)	n.s.
90–91	65.5 (117)	63.1 (125)	3.87*

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p ≤.01, ***p ≤.001

Hartman Middle School SWAS Program

Table 21 shows the data for the comparison between the students enrolled in the SWAS program at Hartman Middle School and the matched non-Magnet comparison sample. The students of the matched sample were selected from Hartman (non-SWAS students), Deady, and Thomas middle schools. The covariates in the analyses were the fifth grade scores (i.e. the students in the samples were equalized based on their fifth grade MAT6 scores prior to entering the middle school program). The statistical analysis of the data indicated that there were significant differences between the adjusted mean test scores in the areas of science during both the 1988–89 and 1990–91 school years. Comparing the adjusted mean test scores in science and complete battery, the 1990–91 eighth grade students in the sample from Hartman scored 11.3 points higher than the comparison group when the students were in the sixth grade (1988–89) after one year in the program and 12.7 points higher during the 1990–91 school year after three years in the program. In the area of math, although statistically significant differences were not found, the students in the Fondren sample scored 3.0 and 3.4 points higher than the students in the matched samples during the 1988–89 and 1990–91 school years, respectively.

Table 21. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Hartman (Magnet)	Match (non-Magnet)	*F*
Science			
88–89	60.8 (62)	49.5 (64)	29.15***
90–91	59.1 (63)	46.4 (64)	29.62***
Total Math			
88–89	64.1 (62)	61.1 (64)	n.s.
90–91	59.1 (63)	55.7 (64)	n.s.
Complete Battery			
88–89	60.2 (62)	55.5 (64)	8.86**
90–91	58.3 (63)	51.8 (64)	8.69**

Values in parentheses indicate the number of students in the analysis.
* p≤.05, ** p ≤.01, ***p ≤.001

Summary and Conclusions

In this analysis of Science/Math programs, for elementary level programs, fifth grade students who had been enrolled in Add-On Programs and School-Within-A-School (SWAS) programs since the first grade and who had MAT6 scores available were selected. For middle school SWAS programs, eighth grade students who had been enrolled in the program since the sixth grade were selected. The standardized achievement scores of these students, particularly in the areas of science and math, were compared to the scores of comparison groups of students. Comparison groups for the Add-On Programs were selected from schools that had similar demographic characteristics as the Magnet schools. Comparison groups were generated for the SWAS programs from the home zoned schools of the SWAS students. Fifth and eighth grade students from these matched schools were identified based on the same selection criteria as the Magnet students. A separate comparison group was generated for each Magnet program. Efforts were made to assure that the Magnet groups and the comparison groups were as similar as possible except for the Magnet students' enrollment in the Science/Math programs. An Analysis of Covariance (ANCOVA) was conducted so that pre-existing differences between the academic levels of the students could be minimized. In this analysis, the Magnet and comparison groups were equalized, generally using first grade MAT6 scores for elementary school programs and and fifth grade scores for middle school programs. Subsequently, adjusted mean test scores were compared.

Students enrolled in elementary level Science/Math Add-On Programs did not score significantly higher than the comparison group on the MAT6 science tests during the 1988–89 and 1991–91 school years after being enrolled three and five years, respectively, in the enrichment programs. However, in six of the seven programs, the students in the Magnet programs did score between 1.5 and 5.1 points higher than the matched comparison group on the science test during the 1990–91 school year. Except for one program, students enrolled in elementary level Science/Math Add-On Programs did not score significantly higher than the comparison groups on the MAT6 total math tests during the 1988–89 or 1991–91 school years after being enrolled three and five years, respectively, in the enrichment programs. In one program, students scored significantly higher (14.8 points) than their matched comparisen group. In two of the six programs offering math enrichment programs, the students in the Magnet programs scored approximately two points higher than the matched comparison groups on the total math test during the 1990–91 school year. However, in the remaining three programs offering math enrichment, the students in the Magnet program scored between 3.6 and 6.0 points lower than the matched comparison groups.

In general, students enrolled in elementary level School-Within-A-School programs scored significantly higher than the comparison groups on the MAT6 science tests during the 1988–89 and 1990–91 school years after being enrolled three and five years, respectively, in the enrichment programs. During the 1990–91 school year, students in four of the five SWAS programs scored between 14.9 and 34.6 points higher than the comparison groups on the science test. It should be noted that the small sample sizes used in some of these analyses limit the extent to which these results may be generalized to the entire program. In two of the four SWAS programs offering a math enrichment program, students scored significantly higher than the comparison groups, earning an average of 14.4 to 37.3 more points on the total math tests during the 1990–91 school

year. The findings indicate that the two strongest elementary level Science/Math SWAS programs are the programs at Wainwright and Red elementary schools. The analyses indicate also that the program at Lantrip Elementary School, specializing in environmental sciences, also results in increased science achievement scores for the students enrolled in the program.

Students enrolled in the middle school Science/Math SWAS programs scored significantly higher than the comparison groups on the MAT6 science tests during the 1988–89 or 1990–91 school years after being enrolled three and five years, respectively, in the enrichment programs. During the 1990–91 school year, students at all three SWAS programs scored between 5.4 and 12.7 points higher than the comparison groups on the science test. In two of the three SWAS programs, students scored significantly higher than the comparison groups, earning an average of 4.4 to 9.8 more points on the total math test. The findings indicate that all three Science/Math SWAS programs at Clifton, Fondren, and Hartman middle schools result in substantial gains in achievement scores in the areas of science and math for the students enrolled in the programs.

Question 4 What was the level of professional and academic training of specialist teachers teaching in the Science/Math programs during the 1990–91 school year?

Method

To describe the teachers of the Magnet programs, a questionnaire (see Appendix 2) was distributed via the Magnet coordinators to teachers of science, math, and computers in each program. Coordinators were also asked to complete and return a staff information form to the Department of Research and Evaluation indicating the number of specialty teachers at the school. Completed forms from 22 (100%) of the programs were returned. According to the data reported from the schools, there were 142 specialty teachers in these programs: 55 math, 64 science, and 23 computer teachers. A limited number of these teachers were instructors in two of the specialty areas. A total of 137 (96%) of the surveys were returned. Of these, two surveys were discarded due to incomplete data. As a result, the responses from 135 surveys were included in the analysis. Less than 100% of the surveys were returned from only two schools. Descriptive statistics were used to analyze the data gathered from the surveys. Eighty-two elementary level teachers responded to the survey: 34 science, 34 math, and 14 computer teachers; 25 middle school teachers responded: 11 science, nine math, and five computer teachers; and 30 high school teachers responded: 19 science, six math, and five computer teachers.

Findings

Figures 1 and 2 illustrate the past teaching experience of elementary and secondary school Magnet teachers teaching in programs with an enriched curriculum in science, math, and/or computers. The past teaching experience of teachers in elementary school programs was at the elementary school level. Likewise, teachers of middle school and high school programs reported having the most experience teaching at those levels.

Figure 1. Teaching experience of elementary school Magnet teachers, past and present grade levels taught.

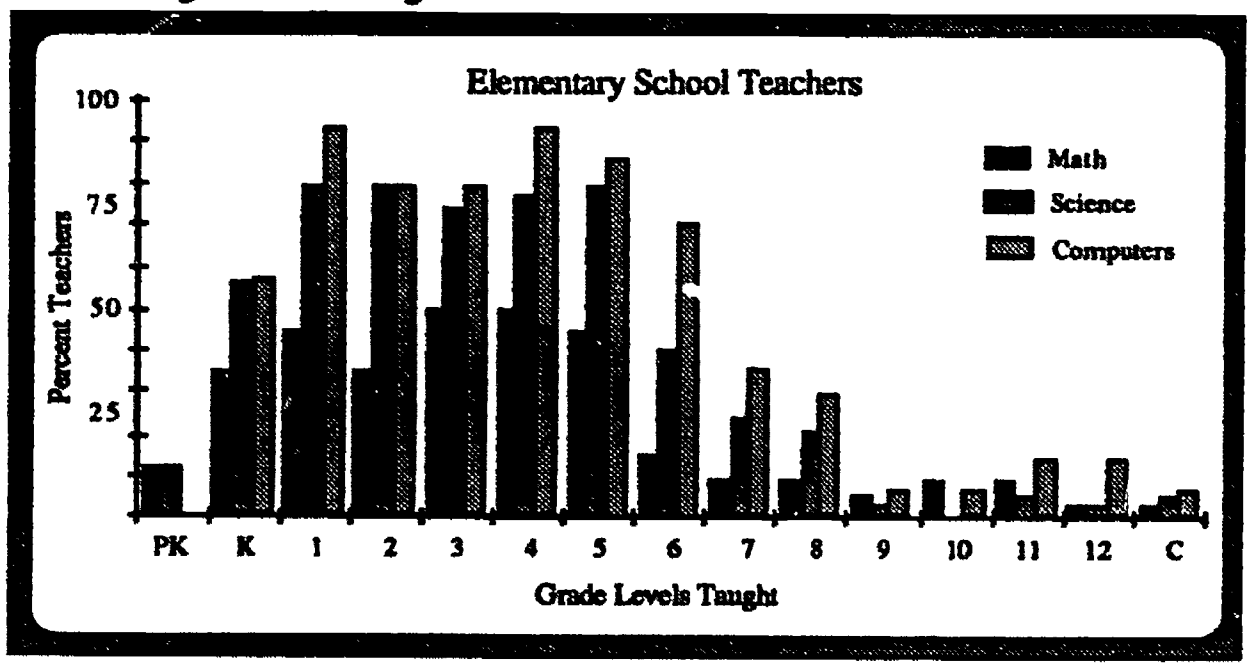

Figure 2. Teaching experience of middle and high school Magnet teachers, past and present grade levels taught.

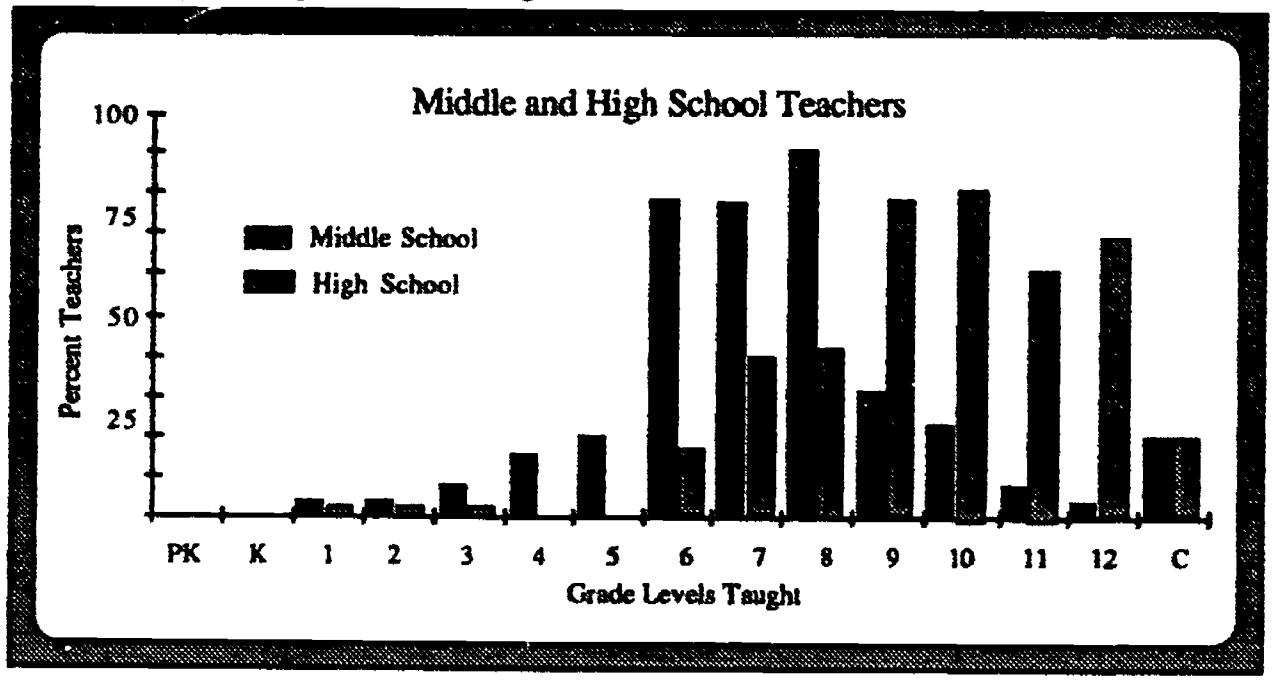

Table 22 shows the teaching certifications held by elementary level Magnet teachers. Ninety percent of the elementary level teachers reported holding elementary certifications, and 88% and 97% of the middle and high school teachers, respectively, reported holding secondary certifications.

Table 22. Percent of Teachers Holding Teaching Certifications

	Percent of Teachers in Category					
	Elementary School				Middle School	High School
Certification	Math	Science	Computer	All**	All **	All **
Elementary	91	85	100	90	20	3
K-12	15	21	7	16	12	3
Secondary	6	15	21	12	88	97
Other	27	24	29	26	12	17
None	3	–	–	1	–	–

** Science, math, and computer teachers combined

Table 23 shows the bachelor's degrees by fields held by elementary level Magnet teachers. The most common degree field for these teachers was in the field of education.

Table 23. Bachelor's Degree by Fields, Elementary Teachers

	Percent of Teachers			
Degree Field	Math	Science	Computer	All **
Education	85	77	57	77
Other	12	9	21	12
Unspecified	3	15	21	11

** science, math, and computer teachers combined

Other includes one or two degrees in the following fields: business education (1), English (2), home economics (1), journalism (1), music (1), physical education (1), psychology (1), and sociology (2).

Table 24 shows the number of master's degrees by fields held by elementary level Magnet teachers. Out of 82 total elementary school teachers, 36 (44%) reported holding master's degrees. The most commonly held master's degrees were in the fields of education, education administration, and curriculum. Two teachers also reported having earned doctorates in the field of science and math education.

Table 24. Master's Degrees by Field, Elementary Teachers

	Number of Teachers			
Degree Field	Math	Science	Computer	Total
Education	7	5	3	15
Ed. Administration	2	4	1	7
Curriculum	–	4	2	6
Guidance/Counseling	2	–	–	2
Science Education	–	–	1	1
Psychology	–	–	1	1
Physical Education	–	1	–	1
Unspecified	–	1	2	3

Table 25 shows the bachelor's degrees by fields held by middle and high school level Magnet teachers. The most common degree field for middle school teachers was education. Twenty percent of the middle school teachers held degrees in math, and 20% held degrees in biology or another science. Forty-three percent of the surveyed high school teachers held degrees in biology or another science.

Table 25. Bachelor's Degree by Fields, Middle and High School Teachers

	Percent of Teachers	
Degree Field	Middle School	High School
Education	32	7
Math	20	7
Biology	8	30
Other Science *	12	13
English	4	7
Science Education	–	7
Other **	24	30

* "Other science" indicates a science other than biology or chemistry.

** Middle School "Other" includes one each in chemistry, curriculum, home economics, physical education, psychology, and unspecified.

** High School "Other" includes one each in business education, chemistry, computer science, engineering, history, home economics, sociology, industrial technology, and unspecified.

Table 26 shows the number of master's degrees by fields held by middle and high school level Magnet teachers. Out of 55 total middle and high school teachers, 31 (56%) held master's degrees. The most commonly held master's degrees were in the fields of education, education administration, curriculum, and in a science other than biology or chemistry. One middle school teacher reported having earned a doctorate in science education; five high school teachers reported having earned doctorates: two in administration and one each in chemistry, physics, and science education.

Table 26. Number of Teachers Holding Master's Degrees by Field, Middle and High School Teachers

	Number of Teachers		
Degree Field	Middle School	High School	Total
Education	3	2	5
Ed. Administration	2	2	4
Curriculum	3	2	5
Science (Not Biology or Chemistry)	3	2	5
Math Education	3	–	3
Math	–	2	2
Chemistry	–	2	2
Science Education	1	1	2
Other	–	3	3

High School "Other" includes one each in accounting, biology, and English.

Table 27 shows the college credit hours earned by Magnet teachers in their specialty areas. Fifty-one percent of the math teachers, 57% of the science teachers, and 7% of the computer teachers at the elementary level reported having earned greater than twelve semester hours[10] of college credit for courses in their specialty area not including instructional methods courses. At the middle and high school levels, 72% and 86% of the teachers, respectively, had greater than 24 semester hours[11] of college credit in their specialty area.

Table 27. Total College Credit Hours Earned by Specialty Teachers in Their Respective Specialty Area*

	Percent of Teachers					
	Elementary School				Middle School	High School
Credit Hours	Math	Science	Computer	All**	All**	All**
0–12	50	44	93	55	12	3
13–18	24	21	–	18	4	3
19–24	18	15	–	13	12	7
25–36	9	9	7	9	36	13
37–48	–	3	–	1	8	20
>48	–	9	–	4	28	53

* Not including instructional methods courses

** Science, math, and computer teachers combined

Table 28 indicates the college credit hours earned by specialty teachers pertaining to their specialty content or the instruction of that specialty since the Fall of 1988. Teachers who had not been teaching in their specialty area for the entire last three years were asked to indicate this by checking "does not apply". Twenty-six percent of the teachers surveyed indicated that this question did not pertain to them. Nine percent of the math teachers, 44% of the science teachers, and 50% of the computer teachers at the elementary level had earned between three and twelve semester hours of college credit for courses in their specialty area or instruction of the specialty in

10 One of the elementary level teacher's course credit was in quarter hours.

11 One of the middle school teacher's course credit was in quarter hours.

the last three years. At the middle and high school levels, 37% and 38% of the teachers, respectively, had between three and twelve semester hours; 23% and 24%, respectively, had earned over twelve semester hours of college credit in their specialty area in the last three years.

Table 28. Hours College Credit Earned in Specialty Area* Since Fall 1988

	Percent of Teachers in Category					
	Elementary School				Middle School	High School
Credit Hours	Math	Science	Computer	All **	All **	All **
0	77	52	50	61	36	38
3-6	9	40	33	27	23	24
7-12	–	4	17	5	14	14
>12	–	–	–	–	23	24

* Pertaining to specialty area content or instruction ** Science, math, and computer teachers combined
*** Column totals do not equal 100% because a small number of teachers did not respond to the question.

Table 29 shows the number of hours of workshops, seminars, and in-service sessions that teachers had attended pertaining to their specialty content or the instruction of that specialty since the Fall of 1988. Teachers were asked to not include college course work when answering this question. Fifty-seven percent of the elementary teachers, 72% of the middle school teachers, and 53% of the high school teachers reported attending greater than twelve hours of workshops, seminars, or in-services specifically pertaining to their specialty area in the past three years.

Table 29. Hours of Workshops, Seminars, and In-Service Attendance* Since Fall 1988

	Percent of Teachers					
	Elementary School				Middle School	High School
Number of Hours	Math	Science	Computer	All **	All **	All **
0	–	6	7	4	4	17
1-12	53	32	21	39	24	30
13-24	18	29	14	22	24	27
25-50	24	12	21	18	24	13
>50	6	21	36	17	24	13

* Pertaining to specialty area content or instruction
** Science, math, and computer teachers combined

Table 30 shows the percent of teachers involved in activities that are designed to share expertise in their specialty area with other teachers. Among the three levels, 36% to 57% of the Magnet teachers had been involved in curriculum development at the campus level at some time since the Fall of 1988; proportionally, elementary level computer teachers reported the highest level of involvement in this activity. Seventeen to 28% of the teachers had been involved in curriculum development at the district level; 20% to 44% of the teachers had been a presenter at a workshop pertaining to content or instruction of their specialty area; and 23% to 28% of the teachers reported that they had been involved in other similar activities since the Fall of 1988. Proportionally, elementary level computer teachers reported the highest level of involvement in all three of these areas. Some of the "other similar activities" that were noted by the teachers were curriculum

development with agencies such as NASA and TEA, participation on textbook selection committees, authoring textbooks, writing laboratory experiments for national publication, and writing grants. Some elementary level teachers noted that they had been presenters of workshops pertaining to areas other than science, math, or computers.

Table 30. Percent Teachers Involved in Activities Since Fall 1988

	Percent of Teachers					
	Elementary School				Middle School	High school
Type of Activity	Math	Science	Computer	All *	All *	All *
Curriculum Development (school level)	32	41	64	41	36	57
Curriculum Development (district level)	12	12	43	17	28	27
Presenter, workshop**	12	27	57	26	44	20
Other similar activities	18	24	36	23	28	23

* Science, math, and computer teachers combined

** Pertaining to specialty area content or instruction

A question on the survey asked teachers to indicate their backgrounds in their respective specialty areas. Teachers were asked to check all areas that applied to them. Table 31 shows the percentage of teachers responding positively for each description of their background in their specialty area. Teachers were asked to indicate if they had a master's degree, a bachelor's degree, or if they minored in the specialty area that they were teaching. Teachers were also asked if their training included past experience of teaching the subjects at the elementary or secondary level. They also indicated if they considered the specialty subject as a personal hobby or if their personal interest in the subject was an important aspect of their training. Further, teachers were asked to indicate if there were other descriptions of their background other than the items listed.

The most notable findings were that 28% of the the middle school teachers held master's degree in the specialty area that they were teaching, and 57% of the high school teachers held a bachelor's degree in the field that they were instructing. A majority of the elementary and secondary teachers noted their past experience of teaching at the elementary and secondary level, respectively, as important training for their participation as teachers in the Magnet programs. Fifty percent or more of the teachers at each level considered their personal interest in the subject taught as being an important characteristic of their participation as teachers in the programs. Some of the other types of training listed by the teachers included a bachelor's degree in engineering, teaching at the college level, "hands-on" science training received through Baylor College of Medicine, and working in private industry for eighteen years. Several of the computer teachers indicated that they had received training through HISD's Department of Technology.

Table 31. Training and Background of Magnet Teachers

	Percent of Teachers					
	Elementary School				Middle School	High School
Type of Background	Math	Science	Computer	All *	All *	All *
Master's degree in field	–	6	–	2	28	13
Bachelor's degree in field	–	6	–	2	48	57
Minor in field	15	15	7	13	28	33
Teaching background, elementary level	62	65	43	60	16	–
Teaching background, secondary level	6	9	–	6	64	53
Interest/hobby	50	59	36	51	56	53
Other	3	18	36	15	4	20

** Science, math, and computer teachers combined

Teachers were also asked to respond to the open-ended question," Please list what you think is your most important qualification for being a math (or science or computer) teacher in this Magnet program?" The most common response was their strong background and expertise in the content area that they were instructing. Teachers indicated that their high interest level in the subject was important. Also, many teachers responded that their willingness to plan "hands-on" activities and to "try something different" and their ability to "make the material relate" to students' lives were among their most important qualifications. Teachers also cited their ability to be creative, enthusiastic, and flexible. Often cited were the teachers' enjoyment and commitment to teaching and their willingness to put in the extra time and effort required to prepare meaningful lessons.

Table 32 shows the number of years that teachers had been teaching in the Magnet program at their school. Forty-six percent of the elementary school teachers had been teaching in the Magnet program for 2–5 years; 44% of the elementary level teachers reported that they had teaching in the program for six or more years. Thirty-two percent of the middle school teachers and 27% of the high school teachers had been teaching in the Magnet program for 2–5 years; 32% of the middle school teachers and 27% of the high school teachers reported that they had teaching in the program for six or more years.

Table 32. Years* Teaching in Magnet Program

	Percent of Teachers					
	Elementary School				Middle School	High School
Years	Math	Science	Computer	All *	All *	All *
0	3	–	–	1	4	7
1	12	6	7	9	32	40
2-5	44	50	43	46	32	27
6-10	29	18	36	26	24	20
>10	12	27	14	18	8	7

* Prior to 1990-91

Table 33 shows the number of years total classroom teaching experience of Magnet teachers. Approximately one-half or more of the teachers in the Magnet programs had been teaching for over ten years.

Table 33. Total Years* Teaching

	Percent of Teachers					
	Elementary School				Middle School	High School
Years	Math	Science	Computer	All **	All **	All **
0	3	–	–	1	–	7
1	–	–	–	–	4	7
2-5	27	12	7	17	20	27
6-10	15	12	7	12	28	13
>10	56	76	86	68	48	47

* Prior to 1990-91

** Science, math, and computer teachers combined

Other Magnet or Enriched Curriculum Experience

• At the elementary level, 6% of the math teachers, 6% of the science teachers, and 14% of the computer teachers had taught in other programs with an enriched curriculum in their respective specialty areas. Twenty percent of the middle school teachers and 27% of the high school teachers had taught in other programs with an enriched curriculum in their respective specialty areas.

• At the elementary level, 3% of the science teachers and 7% of the computer teachers had taught in other HISD Magnet programs. Twelve percent of the middle school teachers and 10% of the high school teachers had taught in other HISD Magnet programs.

• One middle school teacher (4%) reported having taught in a Magnet program in a district other than HISD. At the elementary and high school level, none of the responding teachers had taught in a Magnet program other than in any district besides HISD.

Tables 34 and 35 show the age and ethnic distribution of the teachers teaching in math, science, and/or computer Magnet programs.

Table 34. Age Distribution

	Percent of Teachers					
	Elementary School				Middle School	High School
Age	Math	Science	Computer	All **	All **	All **
20-29	12	6	–	7	16	13
30-39	35	32	21	32	28	30
40-49	24	35	36	30	40	40
50-59	24	24	43	27	16	13
60 +	–	–	–	–	–	3

* Column totals do not equal 100% because a small percentage of teachers did not answer this question.

** Science, math, and computer teachers combined

Table 35. Ethnic Distribution*

	Percent of Teachers					
	Elementary School				Middle School	High School
Ethnicity	Math	Science	Computer	All **	All **	All **
Black	56	21	50	40	12	27
Hispanic	–	6	–	2	–	–
White	38	74	50	55	84	57
Asian	3	–	–	1	–	7
Other	–	–	–	0	–	7
Unspecified	–	–	–	1	4	–

* Column totals do not equal 100% because a small percentage of teachers did not answer this question.

** Science, math, and computer teachers combined

Appendix 1

Comparison of MAT6 Achievement Test Scores: Social Studies, Total Reading, and Total Language

Table A.1. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	West University (Magnet)	Ashford (non-Magnet)	*F*
Social Studies			
88-89	76.3 (74)	69.1 (63)	6.39*
90–91	76.4 (71)	70.2 (62)	6.93**
Total Reading			
88-89	71.5 (73)	64.8 (62)	9.37**
90–91	75.3 (72)	69.8 (61)	5.35**
Total Language			
88-89	78.2 (76)	72.0 (63)	10.14**
90–91	76.0 (74)	70.8 (62)	6.36*

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.2. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Pugh (Magnet)	Pilgrim (non-Magnet)	*F*
Social Studies			
88-89	46.5 (52)	51.6 (10)	n.s.
90–91	54.9 (55)	53.8 (10)	n.s.
Total Reading			
88-89	44.3 (54)	48.4 (10)	n.s.
90–91	48.8 (55)	52.5 (10)	n.s.
Total Language			
88-89	56.2 (54)	63.6 (10)	n.s.
90–91	57.3 (55)	67.5 (10)	5.80*

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.3. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Berry (Magnet)	Braeburn (non-Magnet)	*F*
Total Math			
88-89	52.7 (58)	51.2 (17)	n.s.
90–91	51.7 (58)	48.1 (18)	n.s.
Social Studies			
88-89	49.9 (57)	44.4 (17)	n.s.
90–91	50.0 (56)	42.7 (17)	n.s.
Total Reading			
88-89	42.3 (58)	37.0 (17)	n.s.
90–91	46.2 (58)	38.1 (18)	9.89**
Total Language			
88-89	55.7 (58)	48.6 (17)	n.s.
90–91	50.5 (58)	49.5 (18)	n.s.

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.4. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Elrod (Magnet)	Bonham (non-Magnet)	*F*
Social Studies			
88-89	64.9 (25)	63.8 (34)	n.s.
90–91	66.6 (24)	70.0 (31)	n.s.
Total Reading			
88-89	50.5 (29)	58.5 (33)	6.72*
90–91	60.9 (27)	65.1 (28)	n.s.
Total Language			
88-89	70.0 (29)	69.8 (33)	n.s.
90–91	71.6 (27)	72.6 (31)	n.s.

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.5. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	MacGregor (Magnet)	Petersen (non-Magnet)	*F*
Social Studies			
88-89	46.4 (29)	48.7 (24)	n.s.
90–91	58.8 (28)	48.3 (25)	4.11*
Total Reading			
88-89	40.0 (29)	51.0 (25)	14.69***
90–91	44.7 (28)	52.6 (25)	n.s.
Total Language			
88-89	47.0 (29)	56.9 (25)	6.09*
90–91	49.8 (28)	56.6 (25)	n.s.

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.6. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Law (Magnet)	Osborne (non-Magnet)	*F*
Social Studies			
88-89	51.7 (34)	65.4 (26)	6.02*
90–91	51.2 (34)	49.1 (24)	n.s.
Total Reading			
88-89	46.4 (33)	57.1 (24)	4.79*
90–91	51.3 (33)	48.3 (22)	n.s.
Total Language			
88-89	60.8 (34)	66.2 (26)	n.s.
90–91	58.7 (34)	56.5 (24)	n.s.

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.7. ANOVA, Adjusted Means of NCE MAT6, Magnet Add-On Program and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Lockhart (Magnet)	Kelso (non-Magnet)	*F*
Social Studies			
88-89	52.1 (35)	68.1 (42)	9.78**
90–91	54.4 (35)	55.2 (41)	n.s.
Total Reading			
88-89	52.2 (34)	61.8 (42)	6.62*
90–91	56.9 (34)	50.3 (41)	n.s.
Total Language			
88-89	64.2 (35)	69.7 (40)	n.s.
90–91	58.6 (35)	55.1 (39)	n.s.

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.8. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Wainwright (Magnet)	Match (non-Magnet)	*F*
Social Studies			
88-89	78.9 (33)	50.6 (41)	54.80***
90–91	73.3 (33)	58.1 (41)	14.02***
Total Reading			
88-89	65.0 (33)	52.5 (41)	14.65***
90–91	60.2 (33)	55.6 (41)	2.16
Total Language			
88-89	74.9 (33)	63.9 (41)	6.20*
90–91	66.7 (33)	61.6 (41)	1.47

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.9. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Red (Magnet)	Match (non-Magnet)	*F*
Social Studies			
88-89	69.4 (12)	38.7 (12)	18.56***
90–91	75.5 (12)	41.4 (12)	23.30***
Total Reading			
88-89	55.0 (12)	45.1 (12)	3.71
90–91	59.9 (12)	48.0 (12)	3.60
Total Language			
88-89	65.1 (12)	55.0 (12)	2.64
90–91	75.8 (12)	51.1 (12)	16.86***

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.10. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Lantrip (Magnet)	Match (non-Magnet)	*F*
Total Math			
88–89	56.8 (10)	54.7 (8)	n.s.
90–91	65.8 (11)	58.3 (8)	n.s.
Social Studies			
88-89	66.5 (12)	28.4 (8)	13.28**
90–91	60.8 (12)	45.5 (8)	6.07*
Total Reading			
88-89	44.2 (11)	43.2 (9)	1.92
90–91	54.7 (11)	47.1 (9)	.68
Total Language			
88-89	62.5 (11)	42.9 (9)	9.70**
90–91	64.5 (11)	54.9 (9)	2.24

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Table A.11. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Ross (Magnet)	Match (non-Magnet)	*F*
Social Studies			
88-89	57.1 (11)	52.0 (12)	.49
90-91	60.8 (12)	52.2 (12)	2.15
Total Reading			
88-89	49.1 (12)	42.3 (12)	1.61
90-91	54.5 (12)	48.1 (12)	1.44
Total Language			
88-89	61.2 (12)	52.4 (12)	1.38
90-91	56.0 (12)	62.9 (12)	1.19

Values in parentheses indicate the number of students in the analysis.
* p≤.05, *p≤.01, *** p≤.001

Table A.12. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Cornelius (Magnet)	Match (non-Magnet)	*F*
Social Studies			
88-89	57.7 (15)	49.4 (20)	.90
90-91	55.5 (15)	46.9 (20)	1.32
Total Reading			
88-89	49.3 (16)	50.0 (20)	.01
90-91	53.7 (16)	50.4 (20)	.42
Total Language			
88-89	60.8 (16)	60.1 (20)	.01
90-91	55.0 (16)	60.8 (20)	1.12

Values in parentheses indicate the number of students in the analysis.
* p≤.05, *p≤.01, *** p≤.001

Table A.13. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Clifton (Magnet)	Match (non-Magnet)	*F*
Social Studies			
88-89	67.7 (124)	62.8 (131)	8.93**
90–91	65.9 (124)	59.5 (131)	14.90***
Total Reading			
88-89	62.5 (124)	60.3 (131)	3.37
90–91	64.8 (124)	58.8 (131)	16.97***
Total Language			
88-89	67.9 (124)	64.8 (131)	4.91*
90–91	67.6 (124)	60.4 (131)	19.99***

Values in parentheses indicate the number of students in the analysis.
* p≤.05, *p≤.01, *** p≤.001

Table A.14. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Fondren (Magnet)	Match (non-Magnet)	*F*
Social Studies			
88-89	68.5 (117)	60.5 (125)	25.68***
90–91	62.9 (117)	58.7 (125)	8.35**
Total Reading			
88-89	60.8 (117)	58.3 (125)	n.s.
90–91	62.0 (117)	58.2 (125)	6.26*
Total Language			
88-89	70.5 (117)	66.6 (125)	7.07**
90–91	67.2 (117)	64.7 (125)	n.s.

Values in parentheses indicate the number of students in the analysis.
* p≤.05, *p≤.01, *** p≤.001

Table A.15. ANOVA, Adjusted Means of NCE MAT6, Magnet School-Within-A-School and Matched Non-Magnet Comparison Group

	Adjusted Means		
	Harman (Magnet)	Match (non-Magnet)	*F*
Social Studies			
88-89	63.1 (62)	49.3 (64)	35.70***
90-91	62.9 (63)	48.8 (64)	28.87***
Total Reading			
88-89	55.9 (62)	49.4 (64)	9.07**
90-91	55.5 (63)	47.8 (64)	10.76***
Total Language			
88-89	62.7 (62)	58.2 (64)	n.s.
90-91	58.3 (63)	54.5 (64)	n.s.

Values in parentheses indicate the number of students in the analysis.

* p≤.05, *p≤.01, *** p≤.001

Appendix 2

MAGNET MATH TEACHER SURVEY

Instructions: **Please answer the following questions. Most questions require that you check the appropriate box. Please check only one box per question unless otherwise specified. Some questions require you to write additional information. If you need more space than is provided, you may attach an additional page.**

Information from this survey is intended to profile the specialist staff of Magnet's Science/Math/Computers enrichment programs. All responses from this survey will remain anonymous. This survey is not intended to identify individuals and will not be used to assess program staff.

School _____ Circle one: Elementary Middle/Jr. Senior Date _____

1. Which grade levels have you ever taught including those that you currently teach? (Check all that apply.)

❑ Pre-K ❑ K ❑ 1 ❑ 2 ❑ 3 ❑ 4 ❑ 5
❑ 6 ❑ 7 ❑ 8 ❑ 9 ❑ 10 ❑ 11 ❑ 12 ❑ College

2. Which of the following Texas teaching certificates or endorsements do you currently hold? (Check all that apply.)

❑ Elementary
❑ K-12 (Please specify subject(s): _____)
❑ Secondary (Please specify subject(s): _____)
❑ Other (Please specify: _____)
❑ None

3. Please fill in all that apply concerning your academic training:

Degree (Circle the degree earned.)	Field/Subject	Year Earned
B.A. / B.S.	_____	_____
M.A. / M.S. / M.Ed.	_____	_____
Ph.D. / Ed.D.	_____	_____

4. Estimate the total number of college credit hours that you have earned for any math course. (Do not include instructional methods courses.) Indicate whether these are ❑ semester hours or ❑ quarter system hours.

❑ 0-12 ❑ 13-18 ❑ 19-24 ❑ 25-36 ❑ 37-48 ❑ greater than 48

5. If you have been teaching math since the Fall of 1988, how many college credit hours have you earned in math courses or courses relating to math instruction since that time? Indicate whether these are ❑ semester hours or ❑ quarter system hours. If you have not been teaching science during the entire last three years, check "does not apply".

❑ does not apply ❑ 0 ❑ 3-6 ❑ 7-12 ❑ greater than 12

6. Estimate the total number of hours of workshops, seminars, and in-service hours that you have attended during the 1988-89, 89-90, and 90-91 schools years that relate to math content or math instruction. (Do not include college coursework.)

❑ 0 ❑ 1-12 ❑ 13-24 ❑ 25-50 ❑ greater than 50 hours

7. Have you been involved in any of the following activities in the last three years? (Check all that apply.)

❑ curriculum development (school level) ❑ curriculum development (district level)
❑ presenter of a workshop/seminar on math or math instruction

❑ other similar activities (please specify:_____)

8. Please indicate your training and background in math. (Check all that apply.)

❑ Master's degree in math (specify field: _____)
❑ Bachelor's degree in math (specify field: _____)
❑ Hold a Minor in math (specify field: _____)
❑ Have taught math as an elementary teacher before teaching math in this Magnet program.
❑ Have taught math as a secondary teacher before teaching math in this Magnet program.
❑ Math particularly interests you and/or is a hobby
❑ Other (please specify below:)

9. Please list what you think is your most important qualification for being a math teacher in this Magnet program:

_____

_____

_____

10. How many years have you been teaching in the Magnet program at this school?

❑ 0 ❑ 1 ❑ 2-5 ❑ 6-10 ❑ greater than 10

11. How many total years classroom teaching experience do you have previous to this year (include private school experience)?

❑ 0 ❑ 1 ❑ 2-5 ❑ 6-10 ❑ greater than 10

12. Have you taught math in the Magnet program at any other school in HISD?

❑ Yes ❑ No If yes, which school? _____ year(s):_____

13. Have you taught math in a Magnet program in any other school district?

❑ Yes ❑ No If yes, which school? _____ year(s):_____

enrichment area: _____

14. Have you taught in any other school (besides those listed above) that featured an enriched curriculum in math?

❑ Yes ❑ No If yes, which school and district? _____year(s)_____

15. What is your age?

❑ 20-29 ❑ 30-39 ❑ 40-49 ❑ 50-59 ❑ 60 or over

16. To which ethnic group do you belong?

❑ Asian ❑ Black ❑ Hispanic ❑ White ❑ Other (Specify: _____)

17. (For high school teachers only.) Which math course(s) do you currently teach? (Check all that apply.)

❑ algebra I ❑ geometry ❑ algebra II ❑ trigonometry/elementary analysis
❑ pre-calculus/calculus ❑ other (specify:_____)

HISD RESEARCH & EVALUATION
HOUSTON INDEPENDENT SCHOOL DISTRICT