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ABSTRACT

The Computers in Bilingual Education (CIBE) program at South Bronx High School offered computer-assisted instruction in English as a second language (ESL), native language arts, social studies, mathematics, and science to limited-English-speaking students and provided instruction in computer literacy. It served 340 low-income ninth-, tenth-, and eleventh-grade Spanish-speaking students, mostly recent Puerto Rican immigrants. Classroom instruction was funded by several sources, and due to lack of experienced staff, some teachers taught outside their licensing areas. Program students made up over one-half of the school's graduating class. Since the program was strongly supported by the administration, its curriculum closely paralleled that of the mainstream. Analysis of student achievement data indicates: (1) English language development met or approached the objective in both semesters; (2) English, English reading, and native language course completion objectives were met; (3) content-area course passing objectives were met; (4) students achieved high passing rates in computer literacy; and (5) the attendance rate was significantly higher than that of mainstream students. Recommendations for improvement are given. (MSE)

SOUTH BRONX HIGH SCHOOL

PROJECT CIBE

1986-1987

O.E.A. Evaluation Section Report

Robert Tobias, Administrator of Evaluation
Judith S. Torres, Senior Manager

Grant Number: G00-824-5060

SOUTH BRONX HIGH SCHOOL

PROJECT CIBE

1986-1987

Prepared by the O.E.A.
Bilingual Education
Evaluation Unit

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A SUMMARY OF THE REPORT

The Computers in Bilingual Education (CIBE) program at South Bronx High School completed its third year of funding in June 1987. Its two chief goals were to offer limited English proficient (LEP) students computer-assisted instruction in English as a second language (E.S.L.), native language arts, social studies, mathematics, and science, and to provide instruction in computer literacy. The program served 340 low-income ninth-, tenth-, and eleventh-grade Spanish-speaking students. The majority had recently arrived in New York from Puerto Rico. Their English and Spanish proficiency and overall academic preparedness varied.

Classroom instruction in E.S.L. and the bilingual content areas was funded by several sources: municipal tax-levy, state funds for Pupils with Compensatory Educational Needs (P.C.E.N.), and federal Chapter I. To meet a significantly increased enrollment, one social studies, one math, and one half of a science teacher's position were added to the instructional component during the year under review. Because of the difficulty of identifying experienced staff, teachers were working outside their area of license.

The Title VII-funded bilingual resource teacher continued developing curricula for the program and edited "El Vocero Bilingue," the bilingual students' newsletter. Title VII funds also supported instruction in computer literacy and supplementary computer-assisted instruction in the content areas, E.S.L., and native language arts. In the last three areas, computers were used mainly for review/drill purposes. Students in the computer literary class were taught BASIC and developed elementary programming skills. In the keyboarding/word-processing class, they acquired the keyboarding and word-processing skills and terminology required to work effectively in an office setting.

Members of the program's staff revised and translated the curricula for computer literacy 1 and 2; American studies 1 and 2; sequential math 1, 2, 3, and 4; and consumer economics. Also, a computer class and an American history 3 class were added to the curriculum.

Overall, the bilingual program effectively met the needs of its target population. An index of the bilingual program's success is that program students made up over one half of last year's graduating class.

Since the bilingual program was strongly supported by the principal and centralized under the assistant principal for supervision, its curriculum closely paralleled that of the mainstream. School administrators, instructional staff, and CIBE staff members worked together closely to meet the program's objectives.

CIBE's objectives were assessed in English language development (Criterion Referenced English Syntax Test [CREST] and teacher-made tests); native language arts (teacher-made tests); computer literacy (teacher-made tests); content-area subjects (teacher-made tests); and attendance (school and program records). Quantitative analysis of student achievement data indicates that:

- Program students tested at Levels 1 and 2 of the CREST met the proposed objective by mastering an average of one syntactic skill per month of instruction both semesters; students tested at Level 3 in the fall met the objective by mastering an average of 0.8 CREST skills. Students tested at Level 3 in the spring came close to but did not reach the criterion.

- The objective that 70 percent of the students would pass their E.S.L., E.S.L. reading, and N.L.A. courses, was achieved both semesters.

- The objective that program students would achieve passing rates in content-area courses equal to those of mainstream students was met.

- Students made statistically significant gains in computer literacy as measured by a program-developed test. Students achieved high passing rates in this area both semesters.

- Program students met the attendance objective by achieving an attendance rate that was significantly higher than the schoolwide rate.

The following recommendations are aimed at improving the program's overall effectiveness:

- Efforts to recruit licensed teachers in all subject areas should continue.

- Efforts to develop computer instructional units in E.S.L., native language arts, and science should continue. In particular, translations for the PLATO pilot program should become a permanent part of the project.

ACKNOWLEDGEMENTS

The production of this report, as of all Office of Educational Assessment Bilingual Education Evaluation Unit reports, is the result of a cooperative effort of regular staff and consultants. In addition to those whose names appear on the cover, Arthur Lopatin has edited the manuscripts. Margaret Scorza has reviewed and corrected reports, and has coordinated the editing and production process. Shelley Fischer and Martin Kohli have spent many hours, creating, correcting, and maintaining data files. Maria Grazia Asselle, Rosalyn Alvarez, Donna Plotkin, and Milton Vickerman have interpreted student achievement and integrated their findings into reports. Finally, Betty Morales has worked intensively to produce, duplicate, and disseminate the completed documents. Without their able and faithful participation, the unit could not have handled such a large volume of work and still have produced quality evaluation reports.

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COMPUTERS IN BILINGUAL EDUCATION
(PROJECT CIBE)
SOUTH BRONX HIGH SCHOOL

Location:	701 St. Ann's Avenue Bronx, New York 10455
Year of Operation:	1986-87, Third year of Title VII Funding
Target Languages:	English and Spanish
Number of Participants:	340 students of limited English proficiency
Principal:	Joseph De Jesus
Assistant Principal for Supervision:	Euclid Mejia
Project Director:	Sheila Fallick

I. INTRODUCTION

South Bronx High School is an academic-comprehensive high school located in one of New York City's most economically depressed neighborhoods. With a total enrollment of 841 students drawn mainly from the surrounding community, it is a small school. Eighty-seven percent of South Bronx's students are of Hispanic origin.

South Bronx has had a municipally-funded bilingual program since 1977. Its first Title VII program, the Basic Skills Program, was in operation from 1978 to 1982. Its second, the Career Awareness/Survival Skills Project, operated from 1982 to 1984. Project CIBE, which began operating in the Fall of 1984, has been able to build upon the basic-skills and life-skills curricula developed its two Title VII predecessors.

During the year under review, Project CIBE served 340

students of limited English proficiency (LEP) with classroom instruction funded by municipal (tax-levy), state (P.C.E.N.), and federal (Chapter I) sources. Title VII funds were used to provide instruction in computer literacy and supplementary computer-assisted instruction in English as a second language (E.S.L.), native language arts (N.L.A.), and content-area subjects taught bilingually.

Working under the assistant principal (A.P.) for supervision (of mathematics, science, foreign languages, E.S.L., and bilingual education), the Title VII project director coordinated South Bronx's bilingual program. During the year under review, because of increased enrollments, the bilingual program added an additional full-time social studies teacher, a full-time mathematics teacher, and half-time science teacher. The project director said that the bilingual math teacher (who also taught computer literacy) had gotten better results on the Regents than mainstream math. The bilingual program was waiting for one of the paraprofessionals, who had recently graduated from college, to take her licensing exam in bilingual math.

Title VII-supported staff consisted of the project director, one resource teacher, one office aide, and two paraprofessionals. Because of cutbacks in this year's budget, Title VII funded only 60 percent of the resource teacher's position, with the remaining 40 percent being picked up by municipal tax-levy funds. In addition, textbooks and equipment that no longer were funded by Title VII were paid by other funding sources. Additional,

municipally-funded staff included an A.P. for supervision, a bilingual dean, and a bilingual grade advisor. A bilingual guidance counselor and two educational assistants were supported by Charter I funds. Additional support staff consisted of a family assistant who worked closely with the guidance counselor, made home visits, and contacted parents as needed. A visiting bilingual social worker worked individually with students on a crisis-intervention basis.

The program's 17 E.S.L., N.L.A., and bilingual content-area teachers were supported by a combination of municipal, state, and federal funds. The program was somewhat affected by the prevailing shortage of licensed bilingual content-area and E.S.L. teachers. Nevertheless, according to the project director, the overall quality of the teaching was good because many teachers held licenses in foreign languages and could easily adapt their training to the bilingual classroom. A total of four teachers (one E.S.L., one N.L.A., and two math) were licensed in areas different from what they were assigned to teach. Although the project director felt this did not really hamper instruction, she acknowledged that these teachers need extra help in bilingual classroom techniques.

Both the project director and the A.P. regularly reviewed the teachers' lesson plans and made suggestions for improvement. The bilingual resource teacher was in charge of editing the bilingual students' newsletter, "El Vocero Bilingue," which was published three times during the school year. According to the resource

teacher, the students themselves will be in charge of publishing the newsletter during the coming academic year. In preparation, they were studying newspaper layout and writing skills in a special "newsworthy" class, which also taught reading skills through the use of the daily newspaper.

Program implementation was strongly influenced by the school's overall organization and size. The principal was a strong supporter of bilingual education, and had years of experience in the field, as did the A.P who had once been a Title VII project director. The bilingual program, centralized under the A.P., paralleled the school's mainstream curriculum. The A.P., the project director, and the bilingual staff worked together to plan how to meet program objectives. The school's small size was an advantage because it permitted a high level of personal contact and follow-up between staff members and students.

II. STUDENT CHARACTERISTICS

Hispanic students who scored at or below the twentieth percentile on the English version of the Language Assessment Battery (LAB)* and higher on the Spanish LAB were considered LEP and eligible for the program.

Project CIBE served a total of 340 LEP students of Hispanic descent during the year under review: 309 students were present in the fall and 294 students were present in the spring. (In other words, 263 students were enrolled both semesters; 46 students were enrolled in the fall only; and 31 students were enrolled in the spring only.) Data were also received for 39 students who had been included in the program in June 1986 but had left prior to the beginning of the fall semester: 18 were mainstreamed; 10 graduated; 3 transferred to another school; 1 left the United States; and the rest left for unspecified reasons. During the academic year, 79 students left the program. (See Table 1.)

All students served by the program were members of low-

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*The Language Assessment Battery (LAB) was developed by the Board of Education of the City of New York to measure the English language proficiency of non-native speakers of English in order to determine if their level of English proficiency is sufficient to enable them to participate effectively in classes taught in English. The areas measured are listening, reading, writing, and speaking. The LAB was designed to maximize the discrimination of the test for the non-native at the twentieth percentile on the norms for an English proficient sample. This is the cutoff point for eligibility for bilingual and E.S.L. instruction. The Kuder-Richardson Reliability Estimate for the total test was .97 for the high school level (Level 4). Studies have shown that the relative difficulty of items was highly similar for both native and non-native speakers, thus validating the homogeneity of the test's content.

income families that were eligible for the New York City Board of Education's free-lunch program.

TABLE 1

Number of Students Leaving the Program

Reason For Leaving	Left By January 1987	Left By June 1987	Percent of Total
Mainstreamed	6	14	25.3
Transferred	7	7	17.7
Left U.S.	5	7	15.2
Graduated	3	16	24.1
Family Problem	0	1	1.2
Other Reasons	0	13	16.5
TOTAL	21	58	100.0

- Sixty-three students left the program during the academic year.
- Twenty students were fully mainstreamed.

Data on time in the program were available for 280 of the 294 students who were in attendance in the spring of 1987. One hundred and thirty-eight (49 percent) had been in the program for one year; 92 (33 percent) had been in the program for two years; 33 (12 percent) had been in the program for three years; and 17 (6 percent) had been in the program for three years and had participated in a previous bilingual program.

Half of the program students had been born in Puerto Rico (see Table 2), and 99 percent were native Spanish speakers.

TABLE 2

Number and Percent of Program Students by Country of Birth

Region	Country of Birth	Number	Percent
Caribbean	Puerto Rico	171	50.3
	Dominican Republic	47	13.8
Central America	Honduras	22	6.5
	El Salvador	11	3.2
	Guatemala	7	2.1
	Mexico	6	1.8
	Nicaragua	2	.6
	Costa Rica	1	.3
South America	Ecuador	18	5.3
	Colombia	2	.6
	Peru	2	.6
	Venezuela	2	.6
Africa	-	2	.6
North America	United States	47	13.8
TOTAL		340	100.0

- Most of the program students (50 percent) were born in Puerto Rico.

The overall gender ratio of program students was 50 percent of each sex. Grade nine had the highest percentage (43 percent) of students.

Fifty-four percent of the program students were overage for their grade placement. Grade nine had the highest percentage (59 percent) of overage students, whereas grade twelve had the lowest

(33 percent). (See Table 3.)

According to the project director, the students' educational background varied: although some had been well educated in their native countries, others had only minimal schooling. Students from Central America, Ecuador, and Colombia's urban areas tended to be the most educated and literate in Spanish. Students from the Dominican Republic who had not attended school on a regular basis in their native country did the poorest academically. Students from Puerto Rico had varying levels of ability.

The project director felt that students who remained in the bilingual program excelled academically. She pointed out that last year's valedictorian had been a program student and that half of South Bronx's 20 highest-ranking graduates were Project CIBE students. In an interview, the principal said that bilingual students had higher passing rates than the mainstream students.

However, in a separate interview, the program's two paraprofessionals pointed out that some students had been accepted into high school on the basis of age rather than academic preparation. Such students, they said, encountered difficulty in learning the required material. They said that the opposite problem also existed, namely, students who were placed in a lower grade which they had already completed in their native countries, because their school records had never arrived. According to the paraprofessionals, these students tended to become bored because the material was too easy for them.

Table 4 shows the distribution of students' years of

education by grade. Although the majority of the program students had the appropriate number of years of education for their grade placement, variation existed in all grades. The mean years of education in the United States were very high for all grades, suggesting that most of these students had junior high school experience in the United States.

TABLE 3

Number of Program Students by Age* and Grade

Age	Grade 9	Grade 10	Grade 11	Grade 12	Total
13	1	0	0	0	1
14	21	1	0	0	22
15	31	21	4	0	47
16	41	31	6	0	78
17	23	29	25	1	78
18	10	19	14	7	50
19	1	1	20	4	26
20	1	1	0	0	2
TOTAL	129	94	69	12	304**
Overage Students					
Number	76	50	34	4	164
Percent	58.9	53.2	50.7	33.3	53.9

Note. Numbers in bold area reflect expected age range for grade.

* Age on June 30, 1987.

** Data were missing for 36 students.

- Fifty-four percent of program students were overage for their placement.
- Grade nine had the highest percentage (59 percent) of overage students, whereas grade twelve had the lowest (33 percent).

TABLE 4

Students' Years of Education by Grade

	Total Years of Education							Years Education Native Country		Years Education United States	
Grade	<8	9	10	11	12	>12	N	Mean	S.D.	Mean	S.D.
9	2	80	31	7	2	1	123	6.7	2.1	3.0	2.4
10	1	6	51	32	2	0	92	7.1	2.2	3.3	2.3
11	2	0	14	39	9	4	68	8.0	2.1	3.0	1.9
12	0	0	0	1	5	6	12	8.7	3.1	3.8	2.6
TOTAL	5	86	96	79	18	11	295*	7.2	2.2	3.1	2.4

*Data were missing for 45 students.

. The majority of the students had the expected number of years of prior education.

. Many ninth and tenth graders had attended junior high schools in the United States.

III. FINDINGS

The evaluation findings for the 1986-87 academic year include objectives measurable by standardized tests and those assessable by an examination of program materials and records, site visits, interviews with school personnel, and a questionnaire completed by Title VII staff. Findings are presented by objective as proposed to and accepted by the Office of Bilingual Education and Minority Languages Affairs, U.S. Department of Education.

ENGLISH AS A SECOND LANGUAGE

-- As a result of participating in the program, students in E.S.L. 1 and E.S.L. 2 will master an average of one objective per twenty days of instruction on the beginning level of the Criterion Referenced English Syntax Test (CREST).

-- As a result of participating in the program, students in E.S.L. 3 and E.S.L. 4 will master an average of one objective per twenty days of instruction on the intermediate level of the CREST.

-- As a result of participating in the program, students in E.S.L. 5 and LED will master an average of 0.8 objectives per twenty days of instruction on the advanced level of the CREST.

-- At least 70 percent of the students will score at or above the 65 percent passing criterion in E.S.L., E.S.L. reading, (and native language arts) each semester.

Students were provided with intensive E.S.L. instruction for two to three periods each day. E.S.L. instruction focused on the development of the four basic language skills (listening, speaking, reading, and writing). Appendix A outlines E.S.L. instruction for the fall and spring semesters. There were 12

classes in the fall and 10 classes in the spring.

Students were taught English grammar, vocabulary, and idiomatic usage; they also were taught the survival skills required for daily living. Reading and writing skills were developed to prepare students for the Regents Competency Test and for citywide examinations.

According to the project director, students in E.S.L. 5 took a few mainstream classes. This was because most students preferred to be mainstreamed gradually rather than all at once. Although they were not officially part of the program, fully mainstreamed students were able to receive all program services. This was possible because only a small number of students were mainstreamed each year. The project director followed up on mainstreamed students by reviewing their report cards, and conferring with mainstream teachers.

A member of the evaluation team visited an E.S.L. 4 class. The classroom was decorated with pictures of famous Hispanics. The aim of the day's lesson was to learn to write and answer questions using the present perfect of the verb "to be." Fourteen students were in attendance, and the class was conducted entirely in English. The students read questions based on a short story and then answered them. The questions revolved around a European trip taken by a girl named Elena. The students were asked to identify the countries that Elena had visited on her tour. Students had a list of countries to use as reference, plus a map showing the countries Elena had visited. This was the part of the

lesson in which students were asked to use the present perfect of the verb "to have" with the past participle of the verb "to be." According to the teacher, the format of the lesson was based on the "speak out" strategy, which stresses speaking exercises that isolate, introduce, and provide practice in new structures within a controlled framework.

The students were very attentive and participated enthusiastically. The teacher was lively and provided a great deal of support to the students by frequently praising their work. Her corrections of the students' errors were uniformly positive and constructive.

Student Achievement in E.S.L.

The assessment instrument used to evaluate the first three objectives in this area was the Criterion Referenced English Syntax Test* (CREST). The CREST was administered at the beginning and the end of each semester. A mastery score to indicate gains was computed for each student by calculating the difference between pretest and posttest. The number of months of instruction

*The Criterion Referenced English Syntax Test (CREST) was developed by the Board of Education of the city of New York to measure mastery of instructional objectives of the E.S.L. curricula, and thus was constructed to maximize content validity. The test contains four items per curricular objective, and mastery of an objective is achieved when three of these items are answered correctly. The test measures mastery of 25 objectives at Levels 1 and 2, and 15 objectives at Level 3. The Kuder-Richardson Reliability Estimates for pretest and posttest administrations of the three levels of the CREST are:

Level 1 -- pretest (.91)posttest (.96)
Level 2 -- pretest (.94)posttest (.95)
Level 3 -- pretest (.91)posttest (.91).

between testings was computed for each student by multiplying the number of months between testings by the student's attendance rate. The number of skills mastered per month was calculated by dividing the mean mastery by the mean number of months of instruction between testings.

Table 5 presents the test results for students who were pretested and posttested with the same level. Of the students who were reported to be taking E.S.L. classes (levels 1, 2, and 3), complete data (levels, pretest score, and posttest score) were available for 77 percent (190 students) in the fall and 79 percent (196 students) in the spring.

Examination of Table 5 reveals that program students in beginning (E.S.L. 1 and 2) and intermediate (E.S.L. 3 and 4) level classes, who took CREST Levels 1 and 2, surpassed the objective both semesters. Students test at Level 3 in the spring came close to, but did not reach the criterion. Students mastered an average of 2.1 CREST skills per month at Levels 1 and 2 in the fall, and an average of 1.5 CREST skills per month at these levels in the spring, thus meeting the program objective. Students in E.S.L. 5 and L.E.D., tested at the advanced level of the CREST (Level 3), met the program objective only in the fall. Students who were tested at Level 3 mastered an average of 0.8 CREST skills per month in the fall and 0.7 CREST skills per month at this level in the spring.

TABLE 5

Results of the Criterion Referenced English Syntax Test

Test Level	Number of Students	PRETEST Mean	PRETEST S.D.	POSTTEST Mean	POSTTEST S.D.	MASTERY Mean	MASTERY S.D.	Mean Mastery Per Month
				FALL				
1	87	10.7	6.0	15.6	7.0	4.9	3.6	2.0
2	70	11.8	6.2	17.2	5.5	5.4	3.2	2.3
3	33	10.5	2.9	12.5	2.3	2.0	1.8	0.8
TOTAL	190	11.1	5.7	15.6	6.0	4.6	3.4	1.9
				SPRING				
1	64	10.6	5.0	15.4	5.7	4.8	3.2	1.7
2	75	14.6	5.7	18.5	5.1	3.8	2.7	1.4
3	57	10.4	3.4	12.4	2.8	1.9	1.5	0.7
TOTAL	196	12.1	5.3	15.7	5.4	3.6	2.8	1.3

- Program students mastered an average of more than one CREST skill per twenty days of instruction at the beginning and intermediate levels of E.S.L. both semesters, thus meeting the program objective.
- Students at the advanced level of E.S.L. mastered 0.8 CREST skills per month in the fall, thereby meeting the proposed objective. Students tested at Level 3 in the spring came close to but did not reach the criterion.

Table 6 presents students' passing rates in E.S.L., E.S.L. reading, and native language arts for the fall and spring semesters. The program objective, that 70 percent of the students would achieve a passing grade of 65 percent, was met both semesters in all these areas. The highest passing rate was 82 percent in spring native language arts classes, whereas the lowest was 74 percent in E.S.L. courses in the fall semester.

TABLE 6

Passing Rates in E.S.L., E.S.L. Reading, and Native Language Courses

Course	FALL		SPRING	
	Number of Students	Percent Passing	Number of Students	Percent Passing
E.S.L.	240	74.2	200	75.5
E.S.L. Reading	225	76.0	182	76.9
Native Language Arts	180	80.0	165	82.4

- The program objective of 70 percent of the students obtaining passing grades in E.S.L., E.S.L. reading, and native language arts was met both semesters.

CONTENT-AREA SUBJECTS

-- Students participating in the program will score at or above the 65 percent passing criterion in bilingual math, science, and social studies at a rate that is equal to or greater than that of non-program students in comparable mainstream classes.

Content-area subjects were taught by municipally-funded teachers who used the native language as a medium of instruction. The more advanced the course, the more English was used in the classroom. The curricula used in the bilingual content-area classes paralleled those used in the mainstream classes, and both followed New York State curricula. Appendix B lists the bilingual content-area courses for the fall and spring. Courses in science and social studies were under review to make sure they were academically and culturally appropriate to South Bronx's most recent population of students from Central America.

Several members of the bilingual program staff noted that some instruction in the students' native language was necessary to enable them to learn content areas without being hampered by their low level of English proficiency. However, program students were fully integrated with mainstream students in art, physical education, music, and shop classes, as well as in schoolwide assemblies.

Mainstreamed students (those who accomplished 80 percent of the CREST instructional objectives and reached the twenty-first percentile of the LAB) had the option of remaining in the program with parental consent. Some students chose to stay in the program for certain subjects (e.g., social studies) because of vocabulary

problems. Although mainstreamed students sometimes had problems with English literature, they generally managed to do well.

The project director followed students' progress through contacts with their grade advisors, reviews of report cards, and conferences with mainstream teachers.

A member of the evaluation team observed four bilingual content-area classes: sequential math 2, American history 1, biology 2, and business Spanish.

The sequential math 2 class was conducted mostly in Spanish, but the teacher translated important mathematical terms into English. Thirteen of the 14 students enrolled were present. One paraprofessional was also present. The aim of the class was to learn how to calculate the probability of an occurrence. The teacher had written several problems on the chalkboard and some students were called to the board to solve them. As the students worked out the problems the teacher explained the operations involved in solving them. He also asked the students to explain the steps they had followed in arriving at their answers. The rest of the class worked at their desks, with the paraprofessional circulating around the room to provide individual assistance. The class had excellent discipline and the students seemed to follow the lesson well.

The American history I class was conducted entirely in Spanish. Twenty-three students were in attendance. The lesson focus was on the main battles of the American Revolution. A paraprofessional moved from desk to desk working with individual

students. The teacher was enthusiastic, explained clearly, asked frequent questions, and wrote the names of major battles and important facts on the chalkboard. The class participated eagerly and all students' notebooks and texts were opened to the appropriate page. The teacher asked students to read aloud in Spanish, an activity they seemed to enjoy a great deal. It was obvious that the teacher was well-versed in her subject area and that she related excellently to the students.

The teacher distributed a translation of the relevant chapter from the English textbook. According to the site supervisor, last year the teacher had developed and translated the entire American History curriculum and had the product bound in text form and submitted for printing. But since only 50 copies were printed, the teacher had to run off parts of the text and distribute them on a daily basis. Because a new social studies curriculum had been mandated by the state for 1987-88, the work done by this teacher may well need to be reviewed and possibly re-done.

The biology class had an attendance of 14. According to the site supervisor this number would increase shortly because the students from a larger class were going to be transferred into this class. The class was conducted in Spanish. The teacher had assigned "do now" exercise on the structure of the nervous system. The aim of the lesson was to learn how homeostasis is achieved by living organisms. The discussion centered around paramecia, with the teacher displaying a model showing all parts of the single-

cell organism. The teacher compared the regulatory system of unicellular organisms with that of humans and other multicellular organisms. The teacher asked students to read from the textbook and then followed with explanations to clarify the reading. The students were encouraged to ask questions and did so frequently. The learning environment was excellent and the students were disciplined and involved in the lesson.

The business Spanish class that was observed had an attendance of 20. The lesson dealt with how to use, write, and study the body of business letter. A "do now" exercise was assigned -- to name and write down the 10 main parts of the commercial letter. Three students were asked to write this exercise on the chalkboard. The teacher reviewed each part of the exercise, asking students to clarify and amplify on her explanation. The students were eager to answer the teacher's questions, and many raised their hands. After the exercise had been completed the students wrote the correct answer in their notebooks.

The teacher went on to discuss the day's lesson, wrote a business letter on the chalkboard, and distributed a handout explaining the parts that make up the letter (greeting, main body, etc.). She then asked students to read aloud from the handout and proceeded to amplify the most important points. The teacher also discussed the reasons why it is important to stay in school and take schoolwork seriously. She asked the students their reasons for wanting to study and questioned them about their plans for the

future. This last activity served a good purpose, because it addressed the serious school drop-out problem. The teacher was evidently caring and concerned about her students' future. In turn, the students were responsive and participated actively.

Student Achievement in Content-Area Subjects

Table 7 presents the passing rates for program and mainstream students in mathematics, science, and social studies courses each semester. The statistical significance of the difference between program and mainstream passing rates was determined through a z-test for the significance of difference between two proportions.* This procedure tests whether the difference in the rates of two independent groups is greater than can be expected by chance variation.

Examination of Table 7 reveals that program students attained overall passing rates significantly higher than those of mainstream students in mathematics and social studies, and passing rates comparable to those of mainstream students in science, thus meeting the objective.

*Bruning J. L. and Kintz, B. L. Computational Handbook of Statistics (Glenview, Illinois: Scott, Foresman and Company, 1968).

TABLE 7

Passing Rates for Program and Mainstream Students in Content-Area Courses

COURSE	BILINGUAL PROGRAM Number of Students	BILINGUAL PROGRAM Percent Passing	MAINSTREAM CLASSES Number of Students	MAINSTREAM CLASSES Percent Passing	z-test Value
		FALL			
Math	185	63.1	310	47.8	3.30*
Science	158	54.9	202	63.0	-1.55
Social Studies	244	62.8	266	51.0	2.68*
		60.7		52.8	
		SPRING			
Math	158	66.0	184	54.4	2.18*
Science	165	60.0	195	56.3	0.78
Social Studies	219	74.3	253	62.0	2.85*
		67.5		58.0	

*Statistically significant at .05 level.

• Overall, the objective was met in the fall, but not in the spring.

COMPUTER-ASSISTED INSTRUCTION

-- By the end of each subsequent project year, an additional two computer instructional units will have been developed or identified by the resource teachers in the following areas: E.S.L., native language arts, bilingual math, science, and social studies.

-- As a result of participating in the bilingual computer math class, students will show significant gains in computer literacy.

Title VII funds were allocated to support both computer-literacy instruction and computer-assisted instruction for CIBE participants. Although the implementation of these goals was slow during the project's first year (1984-85), during the summer of 1985, staff members previewed and evaluated all the software packages that had been purchased during the school year. They made decisions about the applicability of particular packages to the various components of the bilingual program, and also revised and translated the mainstream curriculum for computer literacy 1 and 2.

During a staff development day in the fall of 1985, teachers were introduced to the software that had been reviewed and evaluated, and a list of this software was distributed. The software itself, together with a set of written evaluations, was kept in the office of the A.P. for supervision to enable teachers to review available software. The A.P. also kept a copy of the New York State Software Review Databank for faculty use. However, the school did not own most of the software mentioned in the state databank.

In 1985-86, three units of social studies were translated

into Spanish by the resource teacher. The Spanish-language instructions and content for each lesson were distributed to students in the form of handouts, which they could then use when working with the (English-language) social studies program. However, because the state has mandated changes in the social studies curriculum, major changes may have to be made. The resource teacher also translated instructions for the P.F.S.-Write program used in the E.S.L. and word-processing classes. As well, the resource teacher translated pertinent units of a business software manual that had been created by the A.P. for business.

This year, the program continues to work on translating social studies curricula and on translating software programs. The following courses had their curricula and materials developed and/or adapted this year for use by program students: computer literacy 1 and 2; American studies 1 and 2; sequential math 1, 2, 3, and 4; and consumer economics. For 1986-87, one computer class and one American history 3 class were added to the curriculum. The latter course was offered to approximately 12 students because the project director considered it necessary for their English level.

For 1986-87, the PLATO project, a pilot program in computer-assisted content-area instruction, was being tested at South Bronx High School. A private company has selected and is funding 10 high schools in New York City to participate in this project. Students were assigned computer-assisted programs in content areas according to their instructional needs. The program's math and

social studies teachers had been partially relieved of classes in order to translate the PLATO instructions into Spanish.

Four computer labs were operational in the fall of 1986. Two labs were equipped with 17 IBM personal computers each, and one lab had 33 Tandy terminals. One lab had 30 Data Control units using the PLATO CAI-software system. Each computer lab had from four to six printers. In addition, all labs had television monitors for classroom-wide instruction. All four labs were in use approximately 85 percent of the time. Weekly lab-use schedules were finalized by the A.P. for supervision on the basis of lab-use requests submitted by teachers. The labs were the full-time responsibility of two computer paraprofessionals who "booted-up" machines with the appropriate software for each class and helped teachers whenever necessary.

In addition to the four labs, the bilingual program had five IBM-PC terminals and printers of its own. Placed on carts, these machines moved from class to class as needed. Teachers scheduled their use through the bilingual office.

The project director visited each E.S.L. class two times during both the fall and spring to familiarize students with computer terminal use. She reviewed the keyboard, introduced students to the P.F.S.-Write program, and gave lessons on the application and use of the function keys.

Teachers were required to review the correct computer operating and safety procedures with students at the beginning of each semester. To further insure proper use, each student was

given a copy of "Principles of Safety in a Computer Room," which discussed how to care for and use the computer terminal printer, disk drive, and diskettes. Students and their parents were required to read and sign these safety rules. In addition, before they were permitted to operate computer equipment, students had to pass a "Safety Test for Computer Lab."

Both students and teachers were receptive to the incorporation of computers into the bilingual curriculum. Computer-assisted instruction was offered in the content areas, E.S.L., and native language arts. Instruction in computer literacy (computer literacy 1 and 2) and word processing (bilingual keyboarding/word processing) were offered this year. Bilingual Keyboarding 2, Bilingual Computer Literacy 2, and Bilingual Word Processing 2 also were offered in the spring.

In the computer literacy classes, students were taught the BASIC computer language. They also practiced programming skills in their math classes. The bilingual keyboarding/word-processing classes familiarized students with the use of the keyboard and the overall working of the word processor. In addition, students were taught business applications of the word processor, along with appropriate terminology.

Computer literacy 1 and 2 were offered as electives by the math department and paralleled the mainstream curriculum. Two computer literacy 1 classes were offered in the fall, and two computer literacy 2 classes were offered in the spring.

A member of the evaluation team visited one computer literacy

class. Fourteen students were in attendance. The subject of the lesson was how to program the computer to print a flow chart showing distance, rate, and time based on data from a math problem. The teacher wrote the numerical data on the board and asked the students to construct a flow chart that would approximate the expected computer printout. Several students were then asked to come to the board and write down their flow charts. He went on to write a distance problem on the board and asked the students to use a D(istance) = R(ate) x T(ime) formula to arrive at the answer.

In the bilingual word-processing classes, students were taught the word-processing skills needed for success at the workplace. This was an elective and students were chosen for it on the basis of their instructor's recommendation.

Student Achievement in Computer Literacy

The objective proposed that students would show significant gains in computer literacy as measured by correlated t-test for significance of difference between pretests and posttests in computer literacy. Data were provided for 39 students in the fall (of whom 38 had taken both pretest and posttest) and 24 students in the spring. On the fall test, which had 12 items, students had an average pretest score of 6.0 (s.d.=1.70) and an average posttest score of 7.0 (s.d.=1.60), and the gain of 1 (s.d.=2.06) was statistically significant (t=2.92). In the spring, the test was lengthened to 20 items to more accurately measure students' knowledge. The spring pretest average was 8.25 (s.d.=3.56) and

the posttest average was 16.41 (s.d.=2.00). The gain of 8.17 (s.d.=4.04) was also statstically significant (t=9.91). Thus the program objective was met. The project also provided data on passing rates for students taking computer-related courses. In the fall, 27 of the 39 program students (69 percent) enrolled in the computer literacy course and 69 of the 89 students (78 percent) enrolled in keyboard/typing classes achieved passing grades. In the spring, 24 of 25 program students (96 percent) successfully completed the computer literacy class, as did 36 of the 39 program students (92 percent) enrolled in keyboard/typing classes.

STAFF TRAINING

-- All staff members will be trained in educational aspects related to E.S.L., bilingual education, native language arts, and computer education through attendance at workshops, seminars, conferences, and courses at institutions of higher education.

This year, every program staff member received computer training, thus meeting the program objective. Computer workshops were the focus of two staff development days in September and January. A Board of Education staff development specialist gave one demonstration lesson per semester. The head of the foreign language department also presented model lessons on a regular basis.

All teachers attended monthly departmental meetings that included discussions of professional topics. In addition, the project director and Chapter I staff provided both demonstration

during 1986-87.)

The resource teacher also attended monthly conferences on computer use. The project director attended a conference sponsored by IBM on the use of software in E.S.L. and in the content areas and took two graduate courses. One paraprofessional had completed her degree and was studying for her license exam in Spanish. (Appendix D lists the university courses taken by staff members.)

PARENTAL INVOLVEMENT

-- The Bilingual Parent Advisory Committee will hold at least two meetings per year.

Meetings of the Parent Advisory Committee were held in the fall and the spring to discuss the goals of the CIBE project, thus meeting the program objective. Parents participated in luncheons and shows organized for Puerto Rican Discovery Day and Pan American Day. Parents did not hesitate to come to the school on an individual basis whenever they had particular concerns, or when they were called in by the bilingual dean to discuss their child's disciplinary problems. "El Vocero Bilingue", the bilingual newsletter informing parents about educational programs, cultural events, and meetings continued to be published three times per year and sent to the parents.

ATTENDANCE

-- As a result of participation in the program, students' attendance will be significantly higher than the attendance of mainstream students.

The attendance rate of program students was 86 percent, approximately 14 percentage points higher than the schoolwide attendance rate (72 percent). Since the school's attendance rate includes the attendance of program students, statistical significance between program and school attendance was determined through the application of a z-test for the significance of a proportion. The z-test results ($z = 5.19$) indicate that the attendance rate of program students was significantly higher ($p = <.05$) than the schoolwide rate.

IV. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The Computers in Bilingual Education (CIBE) program at South Bronx High School completed its third year of operation in June 1987. Students who participated in the program received both classroom and computer-assisted instruction in E.S.L., native language arts, and bilingual content areas that paralleled the mainstream curriculum. The CIBE program also provided instruction in bilingual computer literacy and word processing.

Students and teachers appeared enthusiastic about using the computer in the bilingual program. This year the program continued to work on developing translations of software programs.

In 1986-87, the program successfully provided students with instruction in computer use while maintaining a stable, coherent, and consistent academic program. Program participants showed improved mastery of E.S.L. and computer literacy and maintained an attendance rate higher than that of mainstream students. Program students attained higher passing rates than mainstream students in math and social studies, and comparable passing rates in science.

Project CIBE had an experienced staff committed to academic excellence in both Spanish and English, as evidenced by the administrative and teaching staffs' efforts in the development of instructional units in all areas. There was good communication and mutual support between administration and program staff, and they made themselves readily available to program and mainstreamed

students.

Because the program was overseen by the A.P. for supervision (a former Title VII project director), staff and students were not isolated from other academic departments.

RECOMMENDATIONS

On the basis of several site visits, classroom observations, and interviews with program personnel, the evaluation team makes the following recommendations:

-- The program should continue its efforts to hire licensed teachers in all subject areas.

-- Efforts to develop computer instructional units in E.S.L., native language arts, and science should continue. In particular, translations for the PLATO pilot program should become a permanent part of the project.

V. APPENDICES

APPENDIX A

Instruction in English as a Second Language and English Reading (Fall)

Course Title & Level	No. of Classes	No. Taught Out of License	No. of Classes with Para.	Total Register	Title VII Register	Periods Per Day	Course Description	Curric.*	Texts/Materials in Use
ESL 1	3	1	3	55	55	2	ESL STRUCTURE TERM 1	S, P	PATHWAYS TO ENGLISH 1
ESL 2	3	3	2	59	59	2	ESL STRUCTURE TERM 2	S, P	PATHWAYS TO ENGLISH 2
ESL 3	3	1	0	65	65	2	ESL STRUCTURE TERM 3	S, P	PATHWAYS TO ENGLISH 3
ESL 4	2	2	0	30	30	2	ESL STRUCTURE TERM 4	S, P	PATHWAYS TO ENGLISH 4
ESL 5	1	1	1	24	24	1	ESL STRUCTURE TERM 5	S, P	THE ENGLICH NOTEBOOK
ESL READING 1	3	2	2	55	55	1	ESL READING TERM 1	P	SEE ATTACHED
ESL READING 2	2	0	0	59	59	1	ESL READING TERM 2	P	
ESL READING 3	2	0	0	65	65	1	ESL READING TERM 3	P	
ESL READING 4	1	0	0	30	24	1	ESL READING TERM 4	P	
ESL READING 5	1	0	0	23	23	1	ESL READING TERM 5	P	
TRANSITIONAL ESL(LEDF)	1	1	1	14	14	1	ESL FOR ENGLISH DOMINANT AND TRANSITIONAL LEPSTUDENTS	S, P	

*Curriculum codes: C = NYC Curriculum; S = NYS Curriculum; T = Textbook Curriculum; P = Program-developed Curriculum; O = Other Curriculum

Instruction in English as a Second Language and English Reading (Spring)

Course Title & Level	No. of Classes	No. Taught Out of License	No. of Classes with Para.	Total Register	Title VII Register	Periods Per Day	Course Description	Curric.*	Texts/Materials in Use
ESL 1	1	0	1	16	16	2	Same As Fall	Same As Fall	Same As Fall
2	3	3	3	51	51	2	" "	"	" "
3	2	2	0	39	39	2	" "	"	" "
4	3	0	1	48	44	2	" "	"	" "
5	1	1	1	23	22	1	" "	"	" "
ESL READING 1	1	1	0	16	16	1	" "	"	" "
2	2	0	0	51	51	1	" "	"	" "
3	2	0	1	39	39	1	" "	"	" "
4	2	0	0	48	44	1	" "	"	" "
5	1	0	0	23	22	1	" "	"	" "
TRANSITIONAL ESL (LEDS)	2	?	0	44	39	1	" "	"	" "

*Curriculum codes: C = NYC Curriculum T = Textbook Curriculum O = Other Curriculum
S = NYS Curriculum P = Program-developed Curriculum

APPENDIX B

Bilingual Instruction in Subject Areas (Fall Semester)

Course Title & Level	No. of Classes	No. Taught Out of License	No. of Classes with Para.	Total Register	Title VII Register	Percent of Eng. Used	Course Description	Curric.*	Texts/Materials in Use
GLOBAL HISTORY I	4	0	2	120	120	0	GLOBAL HISTORY - TERM 1	C,S	HISTORIA DE LA HUMANIDAD I
GLOBAL HISTORY 3	4	0	4	93	90	0	GLOBAL HISTORY - TERM 3	C,S	HISTORIA DE LA HUMANIDAD II
AMERICAN STUDIES 2	1	0	0	31	25	30%	AMERICAN HISTORY - TERM 2	C,S	HISTORIA DEL PUEBLO DE LOS E.U.
FUND. MATH 1	4	4	2	96	96	0	FUNDAMENTALS OF MATHEMATICS TERM - 1	C,S	
FUND. MATH 2	2	0	1	37	37	0	FUNDAMENTALS OF MATHEMATICS TERM - 2	C,S	
CONSUMER MATH 1	1	1	0	15	15	0	CONSUMER MATHEMATICS -T. 1	S	
SEQUENTIAL MATH 1	1	1	0	24	23	25%	SEQUENTIAL MATH - TERM 1	C,S	
SEQUENTIAL MATH 3	1	0	1	13	6	40%	SEQUENTIAL MATHEMATICS TERM - 3	C,S	
COMPUTER LITERACY 1	2	0	1	40	36	25%	COMPUTER LITERACY - TERM 1	P	
GENERAL SCIENCE 1	3	0	0	88	88	0	GENERAL SCIENCE TERM - 1	C,S	QUÍMICA INTRUDUCCIÓN A LAS CIENCIAS
BIOLOGY 1	2	0	2	56	56	20%	BIOLOGY - TERM 1	C,S	BIOLOGÍA
REGENTS BIOLOGY 1	1	0	1	14	14	20%	REGENTS BIOLOGY - TERM 1	C,S	BIOLOGÍA

*Curriculum codes: C = NYC Curriculum T = Textbook Curriculum O = Other Curriculum
S = NYS Curriculum P = Program-developed Curriculum

Bilingual Instruction in Subject Areas (Spring Semester)

Course Title & Level		No. of Classes	No. Taught Out of License	No. of Classes with Para.	Total Register	Title VII Register	Percent of Eng. Used	Course Description	Curric.*	Texts/Materials in Use
GLOBAL HISTORY	2	4	0	1	102	102	0	Global Histcry-Term 2	C,S	Historia De La Humanidad- I
AMERICAN HISTORY	1	3	0	2	73	70	25%	American History-Term 1	C,S	Historia Del Pueblo los E.U.
AMERICAN HISTORY	3	1	0	1	14	6	30%	American History-Term 3	C,S	Nueva Historia De Los E. U.
CONSUMER ECONOMICS		1	0	1	30	24	25%	Consumer Economics	C,S	Economia Para Todos
FUND.MATH	1	2	1	1	41	40	0	Fundamentals Of Math. Term 1	C,S	
FUND. MATH	2	2	0	2	58	58	0	Fundamentals Of Math. Term 2	C,S	
CONSUMER MATH	1	2	2	1	35	35	0	Consumer Math.-Term 1	S	
CONSUMER MATH	2	1	1	1	8	7	0	Consumer Math.-Term 2	S	
SEQUENTIAL MATH	2	1	0	1	16	14	25%	Sequential Math.-Term 2	C	
COMPUTER LITERACY	2	2	0	0	25	21	25%	Computer Literacy-Term2	P	
GENERAL SCIENCE	2	4	0	1	104	103	0	General Science-Term 2	C	Química-Intro. a las Ciencias
BIOLOGY	2	3	0	1	52	50	20%	Biology-Term 2	C,S	Biología
*REGENTS BIOLOGY	2	1	0	1	9	8	25%	Regents Biology-Term 2	C,S	Biología

Curriculum codes: C = NYC Curriculum T = Textbook Curriculum O = Other Curriculum
S = NYS Curriculum P = Program-developed Curriculum

APPENDIX C

Staff Development Activities in School

Strategy	Description(s), Goals, or Titles	Staff Attending		Speaker or Presenter	Frequency or Number of Sessions
		No.	Title(s)		
Dept. Meetings	MONTHLY DEPARTMENT MEETINGS		ALL TEACHERS IN THE	E. MEJIA, ASSISTANT PRINCIPAL/	MONTHLY
	WHICH INCLUDE PROFESSIONAL		DEPARTMENT	SUPERVISION	
	TOPICS.				
Workshops	STAFF DEVELOPMENT DAY-		ALL TEACHERS IN THE	S. FALLICK	9/4/86, 1/29/87
	WORKSHOPS ON LANGUAGE TEACHING		DEPARTMENT		
	TECHNIQUES AND ON COMPUTERS-			REPRESENTATIVE OF PLATO PROGRAM	
Other: demonstration lessons, lectures, etc.	DEMONSTRATION LESSONS AND ON -	9	ESL TEACHERS, NATIVE	S. FALLICK.	VARIED
	GOING INDIVIDUAL ASSISTANCE		LANGUAGE ARTS	T. HADI.	
	WERE PROVIDED TO TEACHERS IN		TEACHERS	E. MEJIA	
	THE PROGRAM				

Staff Development Activities Outside School

Strategy	Description(s), Goals, or Titles	Sponsor/Location	Speaker or Presenter	Frequency/ Number of Sessions	Staff Attending	
					No.	Title(s)
Workshops held outside school						
Conferences and symposia	OBEMLA	TITLE VII - WASHINGTON,D.C	VARIOUS	1	1	A.P. SUPERVISION
	COMPUTER CONFERENCES	BD. OF ED.	VARIOUS	MONTHLY	1	RESOURCE TEACHER
Other	ESL SOFTWARE AND SOFTWARE	IBM	IBM	1	1	PROJECT DIRECTOR
	IN THE CONTENT AREA					

APPENDIX D

University Courses Attended by Staff (Professional and Paraprofessional)

Staff Titles	Institution	Courses	Grade P/F/ Inc/NA	Total No. of Credits Taken	Applicability of Coursework to Program		
					Hardly	Somewhat	Very
PROJECT DIRECTOR	Iona College	S.D. ADMINISTRATION	P	3			✓
" "	" "	Clinical Supervision	P	3			✓
ESL TEACHER	Lehman College	Teaching Of ESL	P	3			✓
EDUCATIONAL ASSISTANT	Mercy College	Methods & Material Of TESL II	P	3			✓
" "	" "	Bil. Teaching Of Math/Science	P	3			✓
" "	" "	"Perceptiva Literaria"	P	3			✓
" "	" "	Span.-Amer. Black Literature	P	3			✓
PROJECT DIRECTOR	Iona College	Legal & Financial mgmt. Of School Districts	P	3		✓	