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ABSTRACT

In the 1988-89 school year, Bilingualism in the Computer Age completed its final year of instruction at Morris High School in the Bronx. The project provided bilingual instructional and support services to 240 Spanish-speaking students of limited English proficiency (LEP) and utilized computers to develop students' English skills and native language proficiency, and to offer bilingual instruction in content areas. The project also trained students to use computers for career-related purposes and offered professional development to its staff. The project met its objectives in the subjects of science and social studies and for attendance. The project failed to meets its English-as-a-Second-Language objective, although this objective had been met the previous year. The project did not provide data on the objectives proposed for Native Language Arts, computer and career education, cultural heritage awareness, or staff development. Recommendations for program improvement include the following: (1) the purchase, if funds are available, of additional computer software; and (2) the provision of the data necessary to evaluate all the program's objectives to the Office of Research, Evaluation, and Assessment. (GLR)

OREA Report

EVALUATION SECTION REPORT

BILINGUALISM IN THE COMPUTER AGE
Grant Number G008525042

1988-89

EVALUATION SECTION
John E. Schoener, Chief Administrator
April 1990

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BILINGUALISM IN THE COMPUTER AGE
1988-89

SUMMARY

- Bilingualism in the Computer Age was fully implemented. During the 1988-89 school year, students received instruction in English as a Second Language, Native Language Arts, content area subjects, computer skills, and career education.

- The project met its objectives in content area subjects, attendance, and dropout rates. OREA could not determine whether the program met its objectives in Native Language Arts, career education, cultural heritage awareness, or staff development, because of a lack of appropriate data. It failed to meet its objective in English as a Second Language.

Bilingualism in the Computer Age, at Morris High School in the Bronx, was funded by Title VII of the Elementary and Secondary Education Act (E.S.E.A.). In its final year of a three-year funding cycle, the project provided bilingual instructional and support services to 240 Spanish-speaking students of limited English proficiency (LEP students).

The project utilized computers to develop students' English language skills, native language proficiency, and bilingual instruction in content areas. It also trained students to use computers for career-related purposes. The project provided tutoring and counseling, and also gave students the opportunity to participate in an after-school work program and in activities designed to enhance awareness of their cultural heritage and future role in society. Bilingualism in the Computer Age offered professional development to its staff.

During the 1988-89 school year, unlike the previous year, the project met its objectives in the content area subjects of science and social studies and for attendance and dropout rates. The project failed to meet its English as a Second Language (E.S.L.) objective, although this objective had been met the previous year. The project did not provide data on the objectives proposed for Native Language Arts (N.L.A.), computer and career education, cultural heritage awareness, or staff development.

One strength of the program was its incorporation of computer learning in content area classes. The deteriorated physical plant presented problems, particularly the leaking ceiling in the computer room. Project staff also complained that the program did not have enough computer software or an advanced bilingual class in mathematics.

The conclusions, based on the findings of this evaluation, lead to the following recommendations:

- If funds permit, purchase additional computer software.
- Provide OREA with the data necessary tc evaluate all the program's objectives.

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I. INTRODUCTION

This report describes the Office of Research, Evaluation, and Assessment's (OREA's) evaluation of the Elementary and Secondary Education Act (E.S.E.A.) Title VII program, Bilingualism in the Computer Age. The project aimed to develop students' English language proficiency, strengthen their native language abilities, build skills in content area subjects and computer use, and increase their self-confidence. The project provided instruction in English as a Second Language (E.S.L.), Native Language Arts (N.L.A.), content area subjects, and computer literacy to 240 Spanish-speaking students of limited English proficiency (LEP students) at Morris High School in the Bronx.

HISTORY OF THE PROGRAM

The final evaluation reports of 1986-87 and 1987-88 give a complete history of the program as well as descriptions of activities and outcomes for those years.

SETTING

Morris High School is located in a depressed area of the Bronx. Drug abuse, poverty, and single-parent households are common. The school was in rundown condition, with some broken windows, and the OREA field consultant observed water leaking through holes in the ceiling onto computer equipment.

PARTICIPATING STUDENTS

A total of 240 students participated in Bilingualism in the Computer Age during the 1988-89 school year. (See Table 1.) All were LEP students. All program students were also eligible for the school's free lunch program, which is evidence of low family income.

According to the program coordinator and family assistant, target students faced a number of problems that impeded their successful performance at school: poor housing, unemployment, periodic emigration to their native country, and shifting family patterns and responsibilities. Many students worked part-time after school. Some families encouraged, or did not deter, students from dropping out of school for full-time jobs.

STAFF

Title VII funded five of the program's positions: the project coordinator, a bilingual family assistant, two bilingual educational assistants (one in E.S.L. classes and another in E.S.L. computer instruction), and a bilingual secretary. Chapter I, P.C.E.N., and basic tax-levy monies funded the remaining positions, which included a bilingual guidance counselor, a bilingual grade advisor, an educational assistant, and 18 teachers.

The project coordinator, bilingual guidance counselor, and bilingual grade advisor all had master's degrees and an average of 16 years of experience in education. All teachers held licenses in their teaching areas and had an average of eight

TABLE 1

Number of Program Students by Age and Grade[a]

Age	Grade 9	Grade 10	Grade 11	Grade 12	Total
13	1	1			2
14	5	1	1		7
15	24	12	1		37
16	25	16	6		47
17	17	28	21	0	66
18	6	14	13	4	37
19	1	7	11	6	25
20	0	1	1	5	7
21	0	1	2	2	5
TOTAL	79	81	56	17	233[b]

Students Over-Age for Grade

Number	49	51	27	13	140
Percent[b]	62.0	62.9	48.2	76.4	60.0

Note. Framed boxes indicate expected age range for grade.

[a]As of June 1989.

[b]Data were missing for 7 students.

- Most students were in the ninth and tenth grades.
- Approximately two thirds of the students were over-age for their grade.

years of experience in either bilingual, E.S.L., or foreign language teaching. Assistant principals supervised content area, N.L.A., E.S.L., and business education courses.

DELIVERY OF SERVICES

Program students received instruction in E.S.L., N.L.A., science, social studies, mathematics, and computers. Classes met in the computer room once a week to learn word processing skills.

Students received academic advisement and college counseling. A community group, the Tremont Improvement Program, helped students apply to colleges. Students participated in a Careers Beginners Program which introduced them to various career fields. In the spring, the program offered students after-school paid jobs in the community.

REPORT FORMAT

This report is organized as follows: Chapter II outlines the evaluation methodology; Chapter III describes the project's implementation and evaluates the attainment of its implementation objectives; Chapter IV evaluates the project's attainment of its student performance objectives; and Chapter V offers conclusions and recommendations based on the results of this evaluation.

II. EVALUATION METHODOLOGY

EVALUATION QUESTIONS

The evaluation assessed two major areas: program implementation and outcome. Evaluation questions included the following:

Process/Implementation

- Did the program select students for program participation according to specific criteria?
- Did the program implement the instructional activities for developing English language proficiency as proposed?
- Did the program implement the instructional activities for developing native language proficiency as proposed?
- Did the program implement the instructional activities for developing computer skills as proposed?
- Did participating teachers acquire new computer skills through staff development?

Outcome

- What percentage of program students demonstrated gains on the English Language Assessment Battery (LAB)?
- What percentage of program students demonstrated gains on the Spanish LAB?
- What percentage of program students passed their courses in mathematics, science, and social studies?
- What percentage of students enrolled in computer courses acquired specific computer skills as proposed?
- What percentage of students enrolled in the career orientation course demonstrated a knowledge of job-searching techniques?
- How did the attendance rate of program students compare with that of mainstream students?

- How did the dropout rate of program students compare with that of mainstream students?

EVALUATION PROCEDURES

Sample

An OREA field consultant observed two project classes and interviewed the project coordinator, family assistant, a guidance counselor, and other staff members. OREA provided student data forms for all participating students; the project returned 229 completed forms in the fall of 1988 and 219 forms in the spring of 1989.

Instruments

OREA developed interview and observation schedules for the field consultant's use. Project personnel used OREA-developed data forms to report student demographic, attendance, and achievement information.

Data Collection

The field consultant interviewed school and project personnel and observed classes in October 1988. OREA distributed student data forms in December 1988 and May 1989; the project returned them in February and June 1989.

Data Analysis

OREA used the Language Assessment Battery (LAB) to assess improvement in English proficiency. Program students were tested at grade level each spring. Students' raw scores were converted to Normal Curve Equivalent (N.C.E.) scores, which have multiple

advantages over other scoring methods. They are standard, normalized, and form an equal interval scale. ("Standard" indicates that the unit of measurement is a fraction of the standard deviation of the original distribution of raw scores; "normalized" refers to the fact that the scale is adjusted for the norm group so that its distribution has the shape of a normal distribution; and "equal interval scales" allow for legitimate aggregation or averaging of scores.) Project students' N.C.E.s indicated their standing in relation to the national average of 50.

OREA computed the proportion of students showing gains on the LAB from pretest to posttest.

To insure representative achievement data, OREA included only those students who had been in the program for at least five months and had attended classes for at least 100 school days. OREA extrapolated to estimate full-year scores of late-arriving and early-exiting students.

Limitations

Since all LEP students are entitled to receive bilingual and E.S.L. services, OREA was unable to select an equivalent control group. However, the use of two sets of data, as outlined above, served in lieu of a control group.

III. EVALUATION FINDINGS: IMPLEMENTATION

STUDENT PLACEMENT AND PROGRAMMING

Participating students scored below the twenty-first percentile on the Language Assessment Battery (LAB).* Project staff also used students' records and scores on English, Spanish, and mathematics tests to determine eligibility for participation. The bilingual guidance counselor assessed students' capabilities in order to determine their placement within the program.

INSTRUCTIONAL ACTIVITIES

The project instructed students in E.S.L., N.L.A., content area subjects, computer education, and career education.

English as a Second Language

The project offered students two double periods of beginning, intermediate, advanced, and transitional levels of E.S.L. daily.

Native Language Arts

The project offered seven Spanish language courses emphasizing native history and culture. The project placed students according to their proficiency in Spanish as indicated by test scores.

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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 to determine whether they can participate effectively in classes taught in English. Students scoring below the twenty-first percentile on the LAB are entitled to bilingual and E.S.L. services.

Content Area Subjects

Program students took classes in science, mathematics, and social studies. Science offerings included biology, chemistry, and physical science; mathematics and social studies courses were also varied. Content area courses paralleled mainstream courses. All courses carried credits towards graduation.

The project coordinator felt that the chairpersons of various departments at Morris High School were not always sensitive to the particular needs of bilingual students and that decentralized supervision hindered the implementation of the program. The project coordinator recounted the case of a mathematics chairperson who switched several bilingual students from a first level mathematics class taught bilingually to a second-level class taught in English, and then had to move the students back to the first level because of their deficiencies in English. Staff complained that an appropriate sequence of bilingual mathematics classes did not exist.

Computer Education

The project offered computer courses in financial information processing, applied business keyboarding, and keypunching. Project staff noted that the school's limited budget--only $2,200 for all the school's equipment--hampered this component of the program, since the project did not have sufficient software.

An OREA field consultant observed a bilingual (Spanish and English) financial information processing class of 21 students.

The subject of the lesson was how to read time cards and how to determine the total hours worked by an employee. Students worked on computers, doing mathematics exercises involving money. The teacher presented vocabulary words, which students repeated. A paraprofessional gave individualized instruction in Spanish.

The consultant also observed 15 students using computers in a business class. The goal was to learn how to prepare a budget using Lotus, a spreadsheet program. The students began by translating particular words into Spanish or English, then discussed what was meant by a budget. They then prepared personal budgets as the teacher discussed vocabulary and pronunciation. At the end of the class, the students learned how to do labels on the computer and set up various cells of the spreadsheet. The paraprofessional translated into Spanish, explaining to individuals how to complete each task.

During both classes, water dripped from a leak in the ceiling.

Career Education

Career education included a freshman career orientation course in which students learned how to fill out applications and went through mock job interviews developed by the New York State Education Department.

NONINSTRUCTIONAL ACTIVITIES

The project carried out noninstructional activities in the areas of support services and staff development.

Support Services

One of the project's largest support roles was to promote better attendance and prevent dropouts. To this end, the family assistant monitored attendance, sent letters to parents, telephoned absent students, and/or made home visits. The school's Dropout Prevention Program offered after-school jobs to students who were at risk of dropping out for financial reasons. The family assistant also acted as a liaison between the school's health program for students and Lincoln Hospital, handling the paperwork and making sure that students received dental services and preventive care such as vaccinations. She also made referrals to outside agencies as needed.

Staff Development

The program objectives for staff development were:

- Teachers participating in the program will demonstrate significant improvement in the skills necessary to assess students' needs, to select appropriate methods of instruction, and to write appropriate courses of study.
- Teachers participating in the program will demonstrate significant improvement in their skills in handling and programming computers.

Monthly departmental meetings covered such subjects such as attendance, lesson planning, and test construction. Weekly workshops addressed such topics as disciplinary problems and the

organization of teaching services.

During the year, five staff members took university-level courses on subjects like statistical methods, language development, and teaching E.S.L.

Because the project coordinator was also an assistant principal, he wrote classroom evaluations for all instructional staff in his department (three times a semester for new teachers and once a semester for tenured faculty). He also conducted informal evaluations, in which he discussed creative teaching and new curriculum strategies with teachers, and gave two demonstrations each semester on teaching Spanish.

Other staff development activities included increasing skills through the use of tapes and audiovisual materials. A staff development resource specialist offered after-school computer workshops for teachers

These activities suggest that the program met its objectives in staff development, but OREA could not determine whether this was actually so, since Bilingualism in the Computer Age did not provide the necessary quantitative data.

IV. EVALUATION FINDINGS: OUTCOME

INSTRUCTIONAL ACTIVITIES

The project proposed instructional objectives in E.S.L., N.L.A., content area subjects, computer education, and career education.

English as a Second Language

The evaluation objective for the development of English language skills was:

- As a result of participating in the program, 75 percent of the program students will demonstrate significant gains in English language proficiency, as measured by the LAB.

Complete LAB pre- and posttest scores were available for a total of 128 of the 233 students. The program did not meet its objective, since only 52 percent of the reported students made significant gains.

Native Language Arts

The evaluation objective for the development of Spanish language skills was:

- As a result of participating in the program for one year, 75 percent of the students will show significant gains in Spanish language achievement.

The project did not provide data for OREA to assess this objective.

Content Area Subjects

The evaluation objective for content area subjects was:

- As a result of participating in the program, 65 percent of the students enrolled in content area classes will pass teacher-made final examinations in science and social studies.

The project achieved this objective, since 80.1 percent of the students in the fall and 73.5 percent in the spring passed their science and social studies courses. (See Table 2.)

Computer Education

The evaluation objective for computer education was:

- As a result of participating in the program, 80 percent of the students enrolled will demonstrate a familiarity with computer use in the ninth grade; an ability to keyboard in the tenth grade; the ability to handle word processors and printers in the eleventh grade; and the ability to program and handle word processors and modems in the twelfth grade.

The project did not provide data for OREA to assess this objective.

Career Education

- As a result of participating in the program for one year, 80 percent of the students enrolled in the orientation course will demonstrate a knowledge of job-searching techniques.

According to the project director, 80 percent of the students enrolled in the orientation course demonstrated knowledge of job-searching techniques. However, the project did not provide the data for OREA to confirm whether Bilingualism in the Computer Age had met this objective.

TABLE 2

Passing Rates in Content Area Subjects

Content Area	Fall		Spring		Total	
	Number of Students	Percent Passing	Number of Students	Percent Passing	Number of Students	Percent Passing
Science	91	90.1	87	92.0	178	91.0
Social Studies	135	73.3	132	61.4	267	67.4

- The project met the objective that at least 65 percent of participating students would pass their science and social studies courses.

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NONINSTRUCTIONAL ACTIVITIES

The project proposed noninstructional objectives in cultural heritage awareness, attendance, and dropout rate.

Cultural Heritage Awareness

The evaluation objective for cultural heritage awareness was:

- As a result of participating in the program, 90 percent of the students will demonstrate an increased awareness of their own culture.

Cultural activities included Pan-American Day, the Independence Day of Santo Domingo, Puerto Rican Day, and a celebration of the discovery of Puerto Rico. Students were also able to attend relevant plays at Hunter College.

OREA was unable to determine whether the project met its cultural heritage objective because it did not provide sufficient data.

Attendance

The program objective for attendance was:

- Program students will achieve an overall attendance rate which will be significantly greater than that of the school as a whole.

To assess this objective, OREA performed a *z*-test for proportions. This procedure tested whether the difference between one group's rate and a standard rate is greater than could be expected from chance variation alone. The attendance rate was 85.14 percent for program students and 70.22 percent

for mainstream students. Application of the z-test resulted in a z values of 4.07, indicating that the difference in the two attendance rates was statistically significant. The project met the attendance objective.

Dropout Rate

The program objective for dropout rate was:

- Students participating in the program will demonstrate a dropout rate which will be significantly lower than that of the total school population.

To assess this objective, OREA performed a z-test for proportions (see explanation under "Attendance," above). Since data on dropout rates for the total school population in 1989 were not available, OREA used the school dropout rate for 1988. This was 11.9 percent, while that of program students was 3.86 percent. Application of the z-test resulted in a z value of -3.79, indicating that there was a significant difference in the dropout rates of the two populations. Therefore, the project achieved this objective.

V. CONCLUSIONS AND RECOMMENDATIONS

The primary goal of Bilingualism in the Computer Age was to help students become proficient in English. At the same time, the project developed students' native language skills and exposed them to computers and computer-oriented careers.

During the 1988-89 school year, the 240 project students at Morris High School in the Bronx received instruction in E.S.L., N.L.A., content areas, computer's and career education.

The project met its objectives in science and social studies, attendance, and dropout rates. As less than 75 percent of program students demonstrated significant gains on the LAB, the project failed to meet its E.S.L. objective. Bilingualism in the Computer Age did not provide data for OREA to evaluate the objectives proposed for N.L.A., computer and career education, cultural heritage awareness, or staff development.

The dilapidated physical condition of the school, particularly the leaks in the computer room, was a problem. Project staff also complained that the program did not have enough computer software or an appropriate sequence of bilingual classes in mathematics.

The conclusions, based on the findings of this evaluation, lead to the following recommendation:

- If funds permit, purchase additional computer software.
- Provide OREA with the data necessary to evaluate all the program's objectives.