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ABSTRACT

This project provided 360 students at South Bronx High School (New York) with instruction in English as a Second Language (ESL); Native Language Arts (NLA); the bilingual content area subjects of mathematics, science, and social studies; and computer literacy. The goal of the project was to provide instructional and support services to Spanish-speaking students of limited English proficiency (LEP). The project met its ESL objectives that students would show significant gains on the Language Assessment Battery (LAB), and that at least 70 percent of participating students would pass their ESL and ESL reading courses each semester. One of two NLA objectives was met as well as objectives for parental involvement and staff and curriculum development. Students met the objective of making significant gains in the computer literacy test both semesters. Lack of data prevented OREA from determining whether the project had met its second NLA objective. The project failed to meet its content area subject objective. (GLR)

EVALUATION SECTION
John E. Schoener, Chief Administrator
April 1990

EVALUATION SECTION REPORT

COMPUTERS IN BILINGUAL EDUCATION
(PROJECT CIBE)
Grant Number G008425060-88

1988-89

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COMPUTERS IN BILINGUAL EDUCATION
PROJECT CIBE
1988-89

SUMMARY

- Project CIBE was fully implemented. During the 1988-89 school year, project students received instruction in English as a Second Language, Native Language Arts, content area subjects, and computer literacy. The project also offered staff development, curriculum development, and parental involvement activities.

- Project CIBE met its objectives in English as a Second Language, computer literacy, staff development, curriculum development and parental involvement. It met one of its two objectives for Native Language Arts. It failed to meet its content area objectives.

Computers in Bilingual Education (Project CIBE) completed its fifth and final year. An Elementary and Secondary Education Act (E.S.E.A.) Title VII-funded program, Project CIBE's goal was to provide instructional and support services to Spanish-speaking students of limited English proficiency (LEP students). The program served 360 students at South Bronx High School, aiming to increase English language ability and academic and vocational skills through a program of computer education.

Participating students received instruction in English as a Second Language (E.S.L.); Native Language Arts (N.L.A.); the bilingual content area subjects of mathematics, science, and social studies; and computer literacy. The Language Assessment Battery (LAB) determined program eligibility.

The project met its E.S.L. objectives that students would show significant gains on the Language Assessment Battery (LAB) and that at least 70 percent of participating students would pass their E.S.L. and E.S.L. reading courses each semester. Project CIBE also met the objective that over 70 percent of the students would pass their N.L.A. courses. Students met the objective of making significant gains in the computer literacy test both semesters. Lack of data prevented OREA from determining whether the project had met its second N.L.A. objective, that students would complete the three-year N.L.A. sequence and would pass the Regents examination. Project CIBE failed to meet its content area subject objective, as less than 70 percent of the students passed their courses in mathematics, science, or social studies (except for science during the fall semester).

The project provided staff development activities. The project developed or identified two computer instruction units. Project CIBE met its objectives in staff and curriculum development. The bilingual Parent Advisory Committee (PAC) met twice during the year, thus the project achieved its objective for parental involvement.

TABLE OF CONTENTS

LIST OF TABLES

I. INTRODUCTION

This report documents the Office of Research, Evaluation, and Assessment's (OREA's) evaluation of the Elementary and Secondary Education Act (E.S.E.A.) Title VII-funded program, Computers in Bilingual Education (Project CIBE) in its fifth and final year of funding. The project provided instructional and support services to 360 students of limited English proficiency (LEP students).

HISTORY OF THE PROGRAM

A complete history of Project CIBE and a description of its earlier programming and outcomes can be found in the 1987-88 and earlier final evaluation reports.

SETTING

South Bronx High School is in one of New York City's most economically depressed communities. Area residents are mostly from Puerto Rico and the Dominican Republic. The population is one of great mobility.

PARTICIPATING STUDENTS

Project CIBE students came from the area around South Bronx High School. All participating students were members of low-income families and were eligible for the school's free lunch program. Many were from single-parent families and had to work after school to supplement the family income. Often they had child-care responsibilities.

The educational backgrounds of the students varied. Some had been comparatively well educated in their native countries, others had minimal schooling. Very few, however, were illiterate in their native language.

The largest number of program students were in the ninth grade (see Table 1). Fifty-seven percent of the students were over-age for their grade placements.

STAFF

A project director and two paraprofessionals staffed Project CIBE. All three were fluent in Spanish. The project director held a master's degree. One paraprofessional had a B.A., and the other was in the process of obtaining one. The paraprofessionals assisted with computer instruction. In addition to her administrative duties, the project director reviewed and evaluated the software programs used for English as a Second Language (E.S.L.), Native Language Arts (N.L.A.), and content-area instruction.

DELIVERY OF SERVICES

Students received instruction in E.S.L.; N.L.A.; computer literacy; and the content area subjects of mathematics, science, and social studies taught bilingually. The project also offered staff and curriculum development and activities for parental involvement.

TABLE 1

Number of Program Students by Age and Grade*

Age	Grade 9	Grade 10	Grade 11	Grade 12	TOTAL
13	1	1			2
14	20	1			21
15	35	19	1		55
16	49	37	11		97
17	40	14	29		83
18	26	21	20	1	68
19	6	3	15		24
20	1		4		5
21			4		4
22			1		1
TOTAL	178	96	85	1	360

Program-Wide
Over-Age Students

Number	122	38	44	0	204
Percent	68.5	39.6	51.8	0	56.7

*As of June 1989.

- The majority of Project CIBE students were in the ninth grade.
- More than half of participating students were over-age for their grade.

REPORT FORMAT

This report is organized as follows: Chapter II presents the evaluation methodology; Chapter III describes the program activities and reports on the achievement of the implementation objectives; Chapter IV offers an analysis of the student outcome data; and Chapter V gives conclusions based upon the results of the evaluation.

II. EVALUATION METHODOLOGY

EVALUATION QUESTIONS

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

Process/Implementation

- Did the program select students for program participation according to specific criteria?
- Have the instructional activities for developing English language proficiency been implemented as proposed?
- Have the instructional activities for developing native language proficiency been implemented as proposed?
- Did project staff receive training at workshops, conferences, and college courses?
- Did the project develop or identify two computer instructional units in E.S.L., N.L.A., bilingual mathematics, science, or social studies?
- How many meetings did the bilingual Parent Advisory Committee hold during the year?

Outcome

- What was the average Normal Curve Equivalent (N.C.E.) gain on the Language Assessment Battery (LAB)?
- What percentage of the program students passed their E.S.L. courses?
- What percentage of the program students passed their N.L.A. courses?
- What percentage of program students passed their courses in mathematics, science, and social studies each semester?
- Did program students show significant gains in computer literacy?

EVALUATION PROCEDURES

Sample

An OREA field consultant visited the program site, observed two classes, and interviewed the program director and the school principal. OREA provided student data forms for all participating students. The project returned 360 completed forms.

Instruments

OREA developed interview and observation schedules for the use of the field consultant and a project director questionnaire. Project personnel used OREA-developed data retrieval forms to report student demographic and achievement data.

Data Collection

The consultant interviewed school and program staff and observed classes during March and April. OREA gave the project director questionnaire and student data forms to the project directors in January and in April and collected them at the end of February and June.

Data Analysis

OREA used the Language Assessment Battery to assess improvement in English proficiency. Project CIBE 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.

To assess the significance of students' achievement in English, OREA computed a correlated t-test on LAB N.C.E. scores. The t-test determined whether the difference between the pre- and posttest scores was significantly greater than would be expected by chance variation alone.

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

Project CIBE provided E.S.L., N.L.A., content area, and computer instruction. It also provided staff and curriculum development as well as activities for parental involvement.

STUDENT PLACEMENT AND PROGRAMMING

Participants were eligible for Project CIBE as a result of their scores on the Language Assessment Battery (LAB).* Other selection criteria included parental request, Chapter I guidance counselor interviews, and the results of standardized tests other than the LAB and academic performance. All students were enrolled for a minimum of one semester, and when they reached the transitional E.S.L. level they were enrolled in at least one content area course in English.

INSTRUCTIONAL ACTIVITIES

English as a Second Language

Students received intensive E.S.L. instruction for three periods per day. Beginning, intermediate, advanced, and transitional levels classes were available.

An OREA field consultant observed an advanced-level E.S.L. class. Using only English to communicate, students played a team

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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 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.

version of a game similar to the television show "Jeopardy." All students actively participated. The teacher explained that the purposes of this exercise were twofold: to prepare students for the Regents Competency Test (R.C.T.) and to serve as a rehearsal for a video they were planning to create. The teacher and the project director indicated that the activity was also part of the project's curriculum development activities, which stressed creative ways of teaching.

Computer-assisted instruction was available to assist students with E.S.L.

Native Language Arts

Project CIBE students attended Native Language Arts (N.L.A.) classes according to their level of verbal and written proficiency. Project CIBE also offered two intermediate and three advanced levels of N.L.A. Spanish. One of the intermediate levels was business Spanish.

Program students who completed the three-year N.L.A. sequence were expected to pass the New York State Regents examination in Spanish. Computer-assisted instruction was available to assist students.

Content Area Subjects

Most of the content-area courses were available in the native language. The more advanced the course, however, the more English was used in the classroom. The curricula used in

bilingual content-area classes paralleled those used in the mainstream classes.

Computer-assisted instruction was available for the content areas. Teachers received lists of available computer software relevant to their subject areas. Staff also translated English software instructions into Spanish and printed them for the students' use.

Computer Literacy

Bilingual computer literacy courses taught students how to program in BASIC and reinforced their mathematics skills. The bilingual keyboarding/word processing classes familiarized students with the use of the keyboard, word processing software, and business applications of the word processor. Project CIBE also offered a computer program after school.

In the computer literacy class observed by the field consultant, the teacher directed students to write a program with a flow chart that would determine if a triangle were isosceles, equilateral, or scalene. Students worked on a planned output program that would classify triangles. The teacher used both English and Spanish and provided individual instruction.

NON-INSTRUCTIONAL ACTIVITIES

Staff Development

Th program objective for staff development was:

- All staff members will receive training in educational aspects related to E.S.L., bilingual education, N.L.A., and computer education through attendance at workshops,

conferences, and courses at institutions of higher education.

Staff members received instruction in E.S.L. techniques at four workshops and at demonstration lessons and reading conferences. In-school workshops covered such topics as language teaching and R.C.T. preparation. Project CIBE met its staff development objective.

Curriculum Development

The program objective for curriculum development was:

- By the end of each project year, the resource teacher will have developed or identified two computer instructional units in the following areas: E.S.L., N.L.A., and bilingual content area classes.

The resource teachers and other staff members reviewed, evaluated, and purchased software programs for E.S.L., N.L.A., and bilingual content area classes. They translated instructions for content area programs from English into Spanish. Staff revised and translated mainstream mathematics curricula. Project CIBE met its curriculum development objective.

Parental Involvement

The program objective for parental involvement was:

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

Meetings of the Parent Advisory Committee (PAC) took place in the fall and the spring to discuss progress reports, future plans, and improving student achievement. Fifteen parents attended. The project met its objective.

IV. EVALUATION FINDINGS: OUTCOMES

Project CIBE proposed outcome objectives in E.S.L., N.L.A., content area subjects, and computer literacy.

English as a Second Language

The evaluation objectives for English language development were:

- As a result of participating in the program, E.S.L. students will make statistically significant gains in English language proficiency.
- At least 70 percent of the students will score at or above the passing criterion of 65 in E.S.L. and E.S.L. reading each semester.

Pretest and posttest N.C.E. scores were available for 149 students. In each grade and overall, participating students showed statistically significant ($p < .05$) gains. (See Table 2.) Project CIBE met its first E.S.L. objective.

Over 71 percent of program students passed E.S.L.; over 72 percent passed E.S.L. reading and writing. (See Table 3.) The project met its second E.S.L. objective.

Native Language Arts

The evaluation objectives for native language development were:

- At least 70 percent of the students will score at or above 65, the passing criterion, in native language arts each semester.
- Students in the program will develop and maintain reading and writing skills in Native Language Arts as measured by the completion of a three-year Native Language Arts program and the passing of a citywide or New York State Regents Examination in Spanish.

TABLE 2

Pretest/Posttest N.C.E. Differences on the Language Assessment Battery, by Grade

Grade	Number of Students	Pretest		Posttest		Difference		t Value
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
9	76	11.4	10.4	17.2	12.6	5.8	11.8	4.29*
10	36	11.8	9.2	17.9	11.5	6.1	7.5	4.92*
11	37	16.6	9.3	22.0	12.4	5.4	8.4	3.95*
TOTAL	149	12.8	10.0	18.6	12.4	5.8	10.0	7.04*

*$p < .05$

- Average N.C.E. scores showed a significant increase from pretest to posttest.

TABLE 3

Passing Rates in E.S.L. Courses

Subjects	Fall		Spring			
	Number of Students	Percent Passing	Number of Students	Percent Passing	Number of Students	Percent Passing
E.S.L.	180	69.4	173	72.8	353	71.1
E.S.L. Reading and Writing	166	75.9	140	68.6	306	72.5

- Students achieved the passing criterion for E.S.L.
- Students achieved the passing criterion for E.S.L. reading and writing.

In the fall semester, 87.9 percent of participating students passed their N.L.A. course; in the spring semester, 85.2 percent passed. Project CIBE, therefore, met its first N.L.A. objective. Because the project did not provide appropriate data, OREA was unable to determine whether it had achieved its second N.L.A. objective.

Content Area Subjects

The evaluation objective for content area subjects was:

- At least 70 percent of the students will score at or above the passing criterion of 65 in bilingual mathematics, science, and social studies each semester.

Over 70 percent of program students passed their science courses. In other content area subjects, fewer than 70 percent passed. (See Table 4.) Project CIBE failed to meet its content area subjects objective.

Computer Literacy

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

The project designed a special test in this area. Of the 17 students in the fall for whom both pre- and posttest scores were available, the mean pretest score was 8.8 (s.d.=2.4) and mean posttest score 14.6 (s.d.= 3.5). OREA performed a *t*-test on the gain, 5.8 (s.d.=4.3), which showed significance at the 0.05 level.

In the spring, pre- and posttest scores were available for 11 students. The mean pretest score was 10.3 (s.d.=3.5) and mean

posttest was 15.5 (s.d.=1.9). The t-test on the gain of 4.4 was significant ($p<.05$).

OREA also computed passing rates in teacher-made tests, which showed that 93.3 percent of the students in the fall and 89.5 percent of the students in the spring achieved a passing grade of 65 or more. The project achieved its objective of significant gains in computer literacy.

TABLE 4

Passing Rates in Content Area Subject Courses

Subjects	Fall		Spring	
	Number of Students	Percent Passing	Number of Students	Percent Passing
Mathematics	227	55.1	191	59.2
Science	207	71.5	174	68.4
Social Studies	231	64.9	196	58.2

- Over 70 percent of participating students met the passing criterion in science only during the spring semester.
- Over half of the program students in both semesters passed their content area courses.

V. CONCLUSIONS

Project CIBE completed its fifth and final year at South Bronx High School. The program provided instruction in computer use and classroom and computer-assisted instruction in E.S.L., N.L.A., and content area subjects.

Project CIBE met its E.S.L. objective that students would show significant gains on the LAB from pretest to posttest. It also met the objective that at least 70 percent of participating students would pass their E.S.L. and E.S.L. reading courses each semester. The project met the objectives that over 70 percent of the students would pass their N.L.A. courses, and that students would show a significant increase in computer literacy. Because of lack of data, OREA was unable to determine whether the project met a second N.L.A. objective that students would complete the three-year N.L.A. sequence and would pass the Regents examination. Project CIBE failed to meet its content area subject objective, as less than 70 percent of the students passed their courses in mathematics or social studies; the project achieved that goal only in science in the fall semester.

By providing proposed staff development and accomplishing the projected curriculum development, Project CIBE met its objectives in these two areas. The PAC met twice during the year, allowing the project to achieve its objective for parental involvement.

Project CIBE was partially successful in accomplishing its objectives. In most cases, even if it failed to meet an

objective, it came very close to doing so. The project had a positive effect on the students it served.