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ABSTRACT

Students Upgrading Mathematical Achievement (SUMA) is a part of the Bilingual Mathematics and Science Achievement project for Spanish-speaking Limited English Proficient (LEP) students. Its objective is to provide both remedial tutoring to students lacking mathematics skills and enrichment to students who are potentially gifted in mathematics. Sixty-two high school students were student-tutors to 513 elementary and junior high school LEP students in eight schools in two school districts. A licensed teacher acted as advisor for every five student-tutors. Tutors' attitudes about the program were positive. Project personnel and school staff indicated that tutors had developed a sense of responsibility, commitment, and self-confidence. Based on the findings, two recommendations were made: (1) develop an evaluation design which ensures that similar instruments and procedures are used throughout the program; and (2) follow students to assess retention of mathematics skills acquired in the program. The appendices include a table illustrating program evaluation results. (YP)

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OREA Report

EVALUATION SECTION REPORT

STUDENTS UPGRADING MATHEMATICAL ACHIEVEMENT
PROJECT SUMA

1989

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EVALUATION SECTION
John E. Schoener, Chief Administrator
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STUDENTS UPGRADING MATHEMATICAL ACHIEVEMENT
PROJECT SUMA
1989

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STUDENTS UPGRADING MATHEMATICAL ACHIEVEMENT
PROJECT SUMA*
1989

SUMMARY

- Students Upgrading Mathematical Achievement (Project SUMA) was fully implemented. During the summer of 1989, student tutors offered remedial and enrichment instruction in mathematics to eligible students.
- Those students for whom there were data showed improved scores on a standardized test of mathematics following the completion of the tutoring sessions.

Students Upgrading Mathematical Achievement (Project SUMA) was part of the Bilingual Mathematics and Science Achievement project for Spanish-speaking Limited English Proficient (LEP) students. Its objective was to provide both remedial tutoring to students lacking mathematics skills and enrichment to students who were potentially gifted in mathematics. Sixty-two high school students were student-tutors to 513 elementary and junior high school LEP students in eight schools in two Community School Districts (C.S.D.s).

A licensed teacher acted as advisor for every five student-tutors. Student-tutors worked with students in a one-to-four ratio. Students in C.S.D. 32 received tutoring three hours a day for the 29 days of the program. Students in C.S.D. 25 received tutoring three to six hours a week, depending upon the school which they attended.

Pre- and posttest scores were not available for all students since the C.S.D.s used different time frames for data collection. Tutors' attitudes about the program, as measured on a five-point Likert-type scale, were positive. Project personnel and school staff indicated that tutors had developed a sense of responsibility, commitment, and self-confidence.

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

- Develop an evaluation design which ensures that similar instruments and procedures are used throughout the program.

*This report is based on the final evaluation of the "Student Upgrading Mathematical Achievement (SUMA) 1989" prepared by the OREA Multicultural Education Evaluation Unit.

- Follow students to assess retention of mathematics skills acquired in the program.

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I. INTRODUCTION

This report documents the Office of Research, Evaluation, and Assessment's (OREA's) evaluation of the 1989 Division of Multicultural and Multilingual Education (DOMME) program, Students Upgrading Mathematical Achievement (Project SUMA).

Project SUMA was part of the Bilingual Mathematics and Science Achievement project for Limited English Proficient (LEP) Spanish-speaking students. Project SUMA's objective was to provide both remedial and enrichment tutoring to those students lacking in mathematics skills as well as to those who were potentially gifted in mathematics.

In the first year of implementation tutoring was mainly remedial, but student tutors also worked with a small group of students in good academic standing. From July 3 to August 11, 1989, tutoring took place in eight schools in Community School Districts (C.S.D.s) 25 and 32. The project provided a total of 29 days of tutoring services.

PROGRAM PARTICIPANTS

Teachers

Project SUMA required that one teacher act as advisor and supervisor for every five student-tutors. Thirteen teachers participated in the program, five of them in C.S.D. 25 and eight in C.S.D. 32. A project supervisor oversaw and coordinated teachers' activities.

Tutors

In order to become tutors, students had to meet the following criteria:

- be in their junior or senior year of high school;
- have a minimum average of 85 percent in mathematics;
- be fluent in both English and Spanish;
- supply two letters of recommendation.

The student-tutors worked under the supervision of a licensed teacher. They provided tutoring in mathematics to elementary and junior high school students and attended training workshops. There were 62 student-tutors, 25 in C.S.D. 25 and 37 in C.S.D. 32.

Students

LEP students who were identified by their teachers as needing remediation or as being potentially gifted in mathematics, participated in the program. Students were designated as LEP if they scored under the twenty-first percentile of the Language Assessment Battery (LAB).^{*} A total of 513 LEP students were involved, 360 in C.S.D. 25 and 153 in C.S.D. 32; about ten percent in each district were potentially gifted. Standardized tests (the Comprehensive Test of Basic

^{*}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 proficiency is sufficient to enable them to 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.

Skills [C.T.B.S.] and the Metropolitan Achievement Test [MAT]) assessed academic standing in mathematics.

DELIVERY OF SERVICES

The program design called for a ratio of four students to one tutor. Students in C.S.D. 32 received tutoring three hours a day for the 29 days the program functioned. Students in C.S.D. 25 received tutoring three to six hours a week, according to the school they attended; the rest of the time they participated in a regular summer school program.

II. EVALUATION FINDINGS

ACHIEVEMENT

The project provided pretest/posttest C.T.B.S. scores for 79 of the 99 students from C.S.D. 32. Because of the short interval between pretest and posttest, and because students did not necessarily take pretests at the same time, OREA did not consider it appropriate to use converted scores. Data analysts, therefore, performed simple arithmetic calculations on raw scores.

Pretest scores on the C.T.B.S. ranged from 5 to 93; posttest scores ranged from 18 to 98. Mean values were 48.72 for the pretest and 59 for the posttest, for a mean gain of 10.28 (s.d.=17.45).

District 25 used a different design. They recorded the results of the MAT (administered in spring 1989) as a pretest and planned to compare them with the results of the spring 1990 administration. Their rationale was that the students were going to continue with the program throughout the school year.

ATTITUDES

Tutors responded to a five-point Likert-type scale designed to evaluate their opinions and attitudes. The scale explored such topics as adequacy of site and classroom environments, relationship with the classroom teacher, improvement in their understanding of mathematics, adequacy of materials and methods to serve the tutees' needs, and whether they were interested in

working for the program during the school year.

The project submitted data for 21 tutors. Over 80 percent of the tutors gave positive responses to all questions but one. (See Appendix.) Fewer than 80 percent responded positively to the question asking whether they felt that the needs of the tutees were being met.

In addition to data reported on the surveys, project personnel and school staff indicated that tutors developed a sense of responsibility, commitment, and self-confidence as they assisted other students.

III. CONCLUSIONS AND RECOMMENDATIONS

Project SUMA holds great promise as a tutorial strategy and enrichment for gifted tutees as well as tutors. The preliminary assessment indicates that the target population benefited from the program, as shown by an average increase in C.T.B.S. raw scores of 10.28 points (s.d.=17.45). Tutors also profited from the program by gaining a sense of responsibility, commitment, and self-confidence.

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

- Develop an evaluation design which ensures that similar instruments and procedures are used throughout the program.
- Follow students to assess retention of mathematics skills acquired in the program.

APPENDIX

PROGRAM EVALUATION BY PARTICIPATING TUTORS
(N=21)

<u>TOPIC</u>	<u>Strongly Agree</u>	<u>Agree</u>	<u>Not sure</u>	<u>Strongly Disagree</u>	<u>Disagree</u>	<u>Not Applicable</u>
Adequately prepared	9	8	2	0	1	1
Good environment	13	5	3	0	0	0
Clear assignments	17	0	3	1	0	0
Helpful instructions	17	4	0	0	0	0
Teacher availability	18	2	1	0	0	0
Improved mathematical understanding	14	4	2	1	0	0
Adequate materials	2	15	3	1	0	0
Tutees' needs met	7	9	0	4	0	1
Interest in work	15	4	2	0	0	0