An Evaluation of the Mathematics Phase of the Academic Skills Enhancement Program at Louisiana State University.

Bampia Adikalie Bangura
Louisiana State University and Agricultural & Mechanical College

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A Dissertation
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in
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December, 1978
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The purpose of this study was to compare certain aspects of two remedial mathematics programs at Louisiana State University, Baton Rouge Campus. Specifically, the study was designed to investigate whether or not significant differences existed between the performance in the regular college-level Mathematics 1021 of two groups of academically disadvantaged students; one group having taken the non-college-credit remedial Mathematics courses 0004 and 0005 and the other group having taken the college-credit remedial Mathematics course 0007. It also sought to determine whether or not there was a significant difference between the dropout rates from Mathematics 1021 of the two groups. The two groups were also subdivided into male and female subgroups.

The study took place at Louisiana State University during the fall and spring semesters of 1977-78 academic year. The experimental group consisted of the academically disadvantaged students that completed the remedial Mathematics courses 0004 and 0005 in the fall of 1977-78 academic year, and enrolled in the regular college-level Mathematics 1021 in the spring of 1977-78. The control group was made of those disadvantaged students who completed the remedial Mathematics course 0007 in the fall of 1976-77 academic year and enrolled in Mathematics 1021 in the spring of 1976-77. The students in the two groups were not randomly selected.

To compensate for the initial lack of equivalency in the groups used, the analysis of covariance was used in testing for differences in
performance. The covariates used in the analysis were the students' mathematics ACT and mathematics placement examination scores. The final grades received in Mathematics 1021 served as the performance criterion. To test for significant difference between dropout rates, the critical ratios of percentage differences were found. The data were collected from the files of the Mathematics and Junior Division Departments.

The following conclusions were reached:

1. There was no significant difference between the performance in the regular college-level Mathematics 1021 of the experimental group and that of the control group.

2. The dropout rates from Mathematics 1021 of the experimental and control groups did not differ significantly.

3. The performance in the college-level Mathematics 1021 of the male students in the experimental group did not differ significantly from the performance of the male students in the control group.

4. There was no significant difference between the performance in the regular college-level Mathematics 1021 of the female students in the experimental group and that of female students in the control group.

5. The dropout rate from Mathematics 1021 of the male students in the experimental group was not significantly different from that of the male students in the control group.

6. The dropout rate from Mathematics 1021 of female students in the experimental group was not significantly different from that of the female students in the control group.
The following suggestions were made:

1. In view of the limitations of this study, it is suggested that more research should be conducted to further determine the effectiveness of the remedial mathematics program.

2. There is need for increased training and orientation for the tutors.

3. Diagnostic testing should be done at the beginning of the remedial semester.
Chapter 1

INTRODUCTION

One of the most urgent practical problems facing institutions of higher education today is the question of what is to be done with entering freshmen students who are marginally or inadequately prepared to handle college level work. In a recent report on academically disadvantaged students, a committee appointed by Chancellor Paul W. Murrill of the Louisiana State University, Baton Rouge (LSU) stated that of those new students who entered LSU in the fall of 1976, 22 percent had composite American College Test (ACT) scores of 15 and under. The report further stated that 52 percent had scores of 20 and under. It was projected in the report that the percentage of entering students with low scores would increase in the next few years.

Berger (1971) stated that one-fourth of the 1970 freshmen at the City College of New York were considered to be academically disadvantaged. While this situation is not unique in the two universities mentioned above, it helps to emphasize the urgency of the need to provide solutions to this problem.

A look at different studies connected with the problems of the academically disadvantaged students reveals that these problems were necessitated in part by the "Open Admissions Policy" introduced by many colleges and universities. Within the past few decades, many colleges and universities have changed significantly from educating a select group to educating the bulk of the population.
The adoption of an open admissions policy by an institution means admitting some students who are either not college oriented or are deficient in certain skills necessary for college-level work. Apart from the open admissions policy, Fey (1977) reported that many students entering universities are unable to see relations between specific ideas or skills and other areas of learning, and are equally unable to effectively relate learning to problems of the real world. Whatever the reason for the entering of the academically disadvantaged students into college, several studies have indicated that, in general, these students have deficiencies in the following five areas: writing skills, reading skills, speech skills, study skills and computational skills.

In a desperate move toward providing solutions to the question, "What is to be done about the academically disadvantaged students?", several proposals have been put forward by various educators. One such proposal is to go back to the selective admissions policy once used by institutions of higher learning. To do so would not only result in a significant decline in college enrollment which would create severe financial problems for the institutions, but would also deny a great number of people the right to a higher education. Rosen (1973) has stated:

Educational institutions assume an undeveloped potential in students. They invest a great deal of resources to realize that potential. However, a number of barriers to higher education including admissions criteria, costs, and educational tracking, negate the potential of many people. The rationale of exclusion is that such people, . . . , do not belong in an "academic" environment because of various deficiencies. To achieve open access, all such barriers are to be eliminated, not only among institutions, but among
programs within institutions as well. Institutions must provide for diverse academic, trade, and creative needs of students.

Rosen went on to say that open admissions represented a promise of building a free and open system of higher education, one in which opportunity is not only assumed through access, but guaranteed in retention, where no student is forced to leave for academic or more subtle institutional reasons.

Another approach to the problem would be to neglect the deficiencies and let the academically disadvantaged students mix with the better students in standard college courses on a "sink or swim" basis, providing patchwork help for the disadvantaged as and when is necessary. Baldwin and others (1975) state:

Colleges have always had some underprepared students. These students were handled through their adult education or general studies programs. Since the number of underprepared was generally small, this approach worked. Now that increasingly large percentages of freshmen classes need remediation the "sweep the problems under the rug" attitude is no longer possible.

Also such an approach with the present large numbers of the academically disadvantaged students would lead to a vast waste of human resources and would certainly lower academic standards of universities according to Cangelosi and others (1977). Another weakness of this approach is that it provides help for students in finishing a given task, but the problem of retention remains. Help of this nature is frequently frustrating to the student because it fails to determine where his troubles originate and the degree of his deficiencies.

A fourth approach that is being used is the introduction of comprehensive and systematic programs that would prepare these
academically disadvantaged students in the skills necessary for success in regular college-level classes. Such programs carry different names in different universities and colleges. But all of them have essentially the same purpose, that is to provide remedial instruction that would help students master the fundamentals prerequisite to college-level work.

While remedial programs are being added to existing college programs little research has been done to determine the effectiveness of these programs. The conclusions of the few evaluative studies that have been done about remedial programs have produced conflicting results about the effectiveness of the various programs.

In a survey of developmental mathematics courses at colleges in the United States, Baldwin and others (1975) indicated that of the 104 colleges offering developmental mathematics courses, 72 percent had never evaluated the programs formally. Only 14 percent responded that they had any formal evaluation of their programs, 14 percent never responded to the question on evaluation.

When Burns and Schroeder (1971) evaluated their remedial mathematics program, they concluded that once the low achieving students left the remedial program and entered regular mathematics courses their grade point averages dropped below those of the remedial program. Losak (1969) concluded that for all practical purposes, the remedial reading program at Miami-Dade Junior College, as was designed, did not produce any meaningful differences in student withdrawal from college, was not effective in raising the grade point average during the second semester of college enrollment.
and was not effective in producing a score on a reading test or writing test that was any higher for those students in the remedial program than it was for those students who did not take the remedial courses.

The purpose of this investigation was to evaluate the effectiveness of the quantitative instructional area of the Academic Skills Enhancement Program (ASEP), a remedial program started at the Louisiana State University in the fall of 1977. The quantitative instructional area of the ASEP was directed by the Mathematics Department. According to its director, Dr. Bernard L. Madison, the two new courses Mathematics 0004 and Mathematics 0005, introduced in the fall of 1977, were developed to replace Mathematics 0007 which was the remedial mathematics course before the fall of 1977.

STATEMENT OF THE PROBLEM

The purpose of this study was to compare certain aspects of two remedial mathematics programs at Louisiana State University. The following questions concerning the quantitative skills instructional area of the ASEP constituted the central foci of this study.

1. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged students that took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged students who took the college credit remedial Mathematics course 0007?
2. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged students that took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged students who took the college-credit remedial Mathematics course 0007?

3. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged male students that took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged male students who took the college-credit remedial Mathematics course 0007?

4. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged female students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged female students who took the college-credit remedial Mathematics course 0007?

5. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged male students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged male students who took the college-credit remedial Mathematics course 0007?
6. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged female students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged female students who took the college-credit remedial Mathematics course 0007?

IMPORTANCE OF THE STUDY

Evaluation may be regarded as a phase in a systematic program development. Caro (1971) stated that, ideally, action programming is preceded by a planning process that includes (a) identification of problem, (b) specification of objectives, (c) analysis of the causes of the problems and the shortcomings of existing programs, and (d) an examination of possible action alternatives. Evaluation follows program implementation and provides a basis for further planning and refinement. Greenberg (1968) defined evaluation as "the procedure by which programs are studied to ascertain their effectiveness in the fulfillment of goals." Brooks (1965) listed as evaluation objectives the determination of (a) the extent to which the program achieves its goals, (b) the relative impact of key program variables, and (c) the role of the program as contrasted to external variables. Results of evaluation may be used to modify programs already in progress to increase the likelihood of realization of goals.

Butler, Wren and Banks (1970) stated that there is probably no more accurate test of the success of any curriculum than a careful analysis of its evaluation program. They maintained that while the
broad aim of evaluation concerns itself with the progress of individual students, it also encompasses appraisal of the relative effectiveness of various teaching methods.

Hence the importance of this study did not only lie in the fact that evaluation was part of the process of planning ASEP, but the findings of this investigation would become a key consideration in making decisions about the refinement of the program. Also since the central push of the quantitative skills instructional area of ASEP is focused on bringing the academically disadvantaged students up to levels of performance comparable to those of the students who are adequately prepared for regular college-level mathematics courses, the prime criterion of success or failure of the program was to look at the academic achievement of those students in regular mathematics courses. The scarcity of research directed at evaluating remedial mathematics programs at the college-level also lent support to the significance of this study.

DEFINITION OF TERMS

**Remedial program** is a program designed to provide instruction that prepares the academically disadvantaged students for regular college-level work.

**Academically disadvantaged students** refers to any student with a composite score of 22 or under in the three-part mathematics placement examinations considered as academically disadvantaged.

**Student performance** for the purpose of this study is the letter grade a student achieved upon completion of Mathematics 1021 used as an indicator of his performance. The grading system used in the
regular mathematics courses was as follows:

"A" = 4 quality points per semester hour
"B" = 3 quality points per semester hour
"C" = 2 quality points per semester hour
"D" = 1 quality point per semester hour
"F" = grade carrying no quality point

 Dropout refers to any student, who, for whatever reasons, did not complete Mathematics 1021.

 Mathematics 0004 and Mathematics 0005 are the remedial mathematics courses that met five hours a week for half a semester. These two courses were started in the fall of 1977. They each carry two and half hours credit which cannot be used toward graduation.

 Mathematics 0007 is the remedial mathematics course which had been replaced by Mathematics 0004 and Mathematics 0005. Mathematics 0007 met three times a week for a full semester. It carried three hours college credit which could not be used toward graduation.

DELIMITATION OF THE STUDY

Subjects for this study included freshman students at Louisiana State University who:

1. because of their mathematics ACT scores and their scores in the mathematics placement examinations, were required to take the remedial Mathematics course 0007 in the fall of 1976 prior to enrolling in the regular college Mathematics 1021 in the spring of 1977.

2. because of their mathematics ACT scores and their scores
in the mathematics placement examinations, were required
to take the remedial Mathematics courses 0004 and 0005
in the fall of 1977 prior to enrolling in the regular
college Mathematics 1021 in the spring of 1978.

ORGANIZATION OF THE STUDY

Chapter 1 presents a background for the problem under study.
Emphasis is put on some of the reasons that lead to the admission
into colleges and universities of the academically disadvantaged
freshmen students. It also deals with some of the approaches that
have been used and are being taken to prepare these students for
college-level work.

Chapter 2 presents a review of the related literature. It is
divided into three sections, namely, literature related to remedial
programs at the Preschool, Elementary and Secondary school levels,
literature related to the remedial mathematics programs at the post-
secondary school levels, and a summary of the studies reviewed.

Chapter 3 specifically describes the procedures of the study.
Emphasis is put on the setting and subjects of the investigation, the
experimental design, sources of data and method of data analysis.

In Chapter 4, the data collected in this investigation are
presented and analyzed.

The summary, conclusions and suggestions are presented in
Chapter 5. The bibliography and appendices follow.
Chapter 2

REVIEW OF THE RELATED LITERATURE

The purpose of this chapter is to present a review of studies that dealt with remedial programs. This chapter is divided into two major subheadings:

(1) Literature related to general remedial programs at the preschool level, the elementary and secondary school levels and their impact on preschool, elementary, and secondary school children;

(2) Literature related to the remedial mathematics programs at the post-secondary school levels and their effectiveness in preparing the academically disadvantaged students for regular college level work.

LITERATURE RELATED TO REMEDIAL PROGRAMS AT THE PRESCHOOL, ELEMENTARY AND SECONDARY SCHOOL LEVELS

In a report to the United States Commission on Civil Rights, Gordon and Jablonsky (1967) stated, after a review of nine studies of compensatory programs at the preschool level, that there seemed to be no evidence that compensatory practices at that time sufficiently improved academic achievement in disadvantaged youngsters. They reported that one of the largest compensatory programs undertaken was Project Head Start. This nationwide program had served almost one million children since its inception. It was designed to take young children, just prior to school entry, through a broad based program of educational, medical, and social services to better prepare them
for primary school. Gordon and Jablonsky went on to say that the various efforts at evaluating the impact of this program on the children resulted in a variety of findings. In general, the test scores of children served by the program were higher at the end of the program than they were at the beginning. When compared to expected growth patterns, the Head Start children tended to be performing better than would have been expected without the program. When compared to the children not served by the Head Start program, the children in the program tended to show better progress. There were, however, many instances in which Head Start children showed no significant differences in scores from children not served, but the dominant trend was in the direction of improved performance for the children served. In some of the studies, children served by the program continued to show higher achievement levels throughout the first grade. At the other extreme were studies that indicated no persistent levels after two, four, or six months in kindergarten or first grade. However, the review concluded that the long term impact of the Head Start project as an antidote to the destructive influence of poverty and inferior status on educational and social development was yet to be established.

The Environmental Academics was also a preschool compensatory program designed to overcome educationally disadvantaged children from poor families. In 1972, the designers of this program, Dwyer and Elligett, evaluated its effects on disadvantaged youngsters. The evaluative study showed that the Environmental Academics program resulted in a significantly greater improvement of academic indices
for preschool disadvantaged children than the regular ongoing Head Start program.

In a review of compensatory education for the disadvantaged elementary and secondary school youngsters, Gordon and Jablonsky (1967) looked at the effectiveness of Titles I and III of the Elementary and Secondary Education Act (ESEA). This program was directed at improving the capabilities of the schools, in areas where disadvantaged children are concentrated, to meet their special needs and problems. The review stated that (a) in most instances money was available in such haste that quality of planning and development was limited, (b) many programs had been operative for too brief a period to be effectively evaluated, (c) many programs were funded at levels insufficient to the requirements necessary to do an adequate job, (d) most programs could not find adequate and specialized personnel to mount major efforts, and most programs were unable to report appreciable improvement in academic achievement for the target population.

The Corrective Mathematics Services for Disadvantaged Pupils in Non-Public Schools in New York was designed to (1) increase achievement levels in computational skills of pupils in grades two and three from six months to one year depending on age, grade and degree of retardation and causative factors, (2) increase achievement levels in verbal problem solving from three to eight months, (3) increase the curiosity and interest in mathematics of the target population, (4) help pupils in grades four, five and six to develop greater skills in translating verbal problems into mathematical
equations and finding solutions. When Spinner (1972) evaluated the project, he concluded that, based on the evidence available, the corrective mathematics services was a successful and viable program.

In a critical review of the evaluative studies on the effectiveness of secondary intervention programs, Sherman and Tinto (1975) concluded that while most studies considered possessed serious methodological weaknesses, the resulting evidence nevertheless, suggested that the projects had increased the numbers of students graduating from high schools and applying, enrolling in, and graduating from college. The findings also indicated some positive impact in the areas of academic values, attitudes, and motivation. But neither the gap in academic achievement between disadvantaged and advantaged students nor the academic achievements of participating students relative to non-participating students from similar backgrounds seemed to have been affected. The intervention programs have sought to enrich the educational experiences of the disadvantaged students by providing them with additional institutional and supportive services. At the secondary schools, such programs had sought to raise the academic achievements and motivation of the participants and to increase the numbers of such students graduating from high school, enrolling in college, and graduating from college.

Evaluating the effectiveness of a high school special remedial education program, called a Saturday Morning Remedial Program (SMRP), Kuefler (1972) compared the achievements in various subjects of two groups of students; one group taking part in the program and an equal number of students that did not take part in the
program. The comparisons were made in nine subjects including mathematics, French, science, and chemistry. His findings were that:
(1) In five out of nine subjects, remedial students obtained significantly higher final achievement scores than did the control students. Therefore, he concluded, the program might be considered effective for remedial students in mathematics, chemistry, and physics. (2) Female experimental students appeared to have benefited more from the SMRP classes than did the male experimental students. (3) High previous achievement remedial students seemed to have benefited more than did the remedial students in the middle or low previous achievement subgroups.

A program for low achievers in ninth grade general mathematics was designed in Daniel High School, New Albany, Mississippi, to prepare those students who failed to meet the criteria set for a first course in algebra. Much of the work in that program was designed in such a manner that it would provide review and strengthen skills in the four basic operations with integers. When Bryson (1972) evaluated the program to determine its effects upon the achievement and attitude of students enrolled in it, he arrived at the following conclusions:
1. The achievement gain in ninth grade general mathematics was not affected significantly by utilizing the experimental curriculum. Both the experimental and control groups showed significant increase in achievement at the .001 level during the semester. The greater spread in posttest scores of Negro students in the experimental group as compared with the control group indicated that
the experimental curriculum might be more effective than the traditional program.

2. Changes in attitudes were a function of the type of curriculum used. A mean decrease of 1.24 points in attitude was found for the experimental group, and a mean increase of 5.72 points was reported for the control group. Statistically, at the .05 level, the experimental group showed no significant change during the semester, but the control group experienced an increase which was significant at the .01 level.

LITERATURE RELATED TO REMEDIAL MATHEMATICS PROGRAMS AT THE POST-SECONDARY SCHOOL LEVELS

After the first year of the introduction of the remedial mathematics instruction at the City College of New York, Berger (1971) evaluated the program. In the report, he observed that students retested after one semester of remediation showed significant improvement as compared to a control group that did not take the remedial course. First semester grades revealed that two fifths of the remedial students received non-pass grades. Failure rate for students going from Mathematics 56 (remedial trigonometry) to Mathematics 1 (beginning calculus) showed a non-pass rate of 77 percent. A control group of low ability students going directly to Mathematics 1 had a non-pass rate of 81 percent. Results of questionnaires administered to students revealed general satisfaction with the course, but only half of the students in Mathematics 56 felt they knew the material upon the completion of the course.
The Personalized Approach to College Education (PACE) program at the Community College of the Finger Lakes was designed to provide basic academic skills in reading, English and mathematics for students with academic records in the bottom quartiles of the entering freshmen classes. Evaluating the program, Carter (1976) discovered that 55 percent of the remedial students showed increased mathematics scores. He also found out that the dropout rate for the PACE students for that year was 32 percent as compared to the 50 percent dropout rate of students who did not go through the PACE program.

In an evaluation of the Remedial Mathematics Program at Virginia State College, Clark (1967) concluded that on the basis of the results obtained the placement tests used for differentiating between entering students for different mathematical levels of instruction were ineffective. The purpose of the study was to investigate the following: (1) the relationship between entering non-remedial students' mathematics placement test results and their academic performances in the initial college mathematics courses, (2) the academic performances of those students who have completed the remedial mathematics course and who then enroll in the initial college mathematics courses as compared with the academic performances of the non-remedial students in these initial mathematics courses, and (3) the relationship between the remedial students' mathematics weaknesses and the remedial mathematics course content. He also found that the remedial course was relatively effective in accomplishing its purpose of preparing students who were deficient in mathematics background to compete successfully with non-remedial students.
in two of the three initial mathematics courses. The remedial course did not sufficiently improve the background of those remedial students who later enrolled in the pre-calculus course to enable them to compete successfully with non-remedial students in this course.

When Zwick (1964) evaluated the remedial Mathematics Program at Ohio State University to determine the efficiency of the mathematics placement program and the effectiveness of the remedial program itself, he found that the mathematics placement tests were the best guides for separating students into placement levels for differentiated mathematics instruction. When a group of remedial students were matched on all of the available variables with non-remedial students, analysis of their performances in the next mathematics course showed that the remedial students performed slightly but not significantly better than the non-remedial students. A similar study revealed that the remedial group performed significantly better than the non-remedial group in college algebra and trigonometry courses.

In his evaluation of the effectiveness of remedial arithmetic courses in three selected California Community Colleges as measured by improvement in arithmetic skills and attitudes toward mathematics, Randell (1972) compared two groups of remedial students; one group taught with traditional lecture-demonstration method and the other group used programmed text for instruction. He concluded that:

1) The Community College remedial arithmetic courses could effectively improve students' arithmetic skills and attitudes toward mathematics. 2) The traditional lecture-demonstration method of teaching remedial arithmetic was significantly more effective in
changing students' attitudes positively than was the programmed text approach to teaching. (3) There was little relationship between the improvement of arithmetic skills and the improvement of attitudes.

In a review of the remedial programs in four selected junior colleges in Southern Illinois, Sutton (1970) made the following conclusions:

1. That there were no major differences in economic and environmental background of the remedial and regular groups of students that would contribute to the need for remedial mathematics in junior college.

2. That the major causes of student weaknesses and gaps in mathematics were the result of inadequate backgrounds in high school mathematics.

3. That the criteria used to assign students to remedial mathematics classes did not lend themselves to the identification of individual student strengths, weaknesses, and gaps.

4. That course content was not structured to meet the individual needs of students. Therefore it was quite likely that the only students that were being helped in the remedial classes were those with minor weaknesses.

5. That remedial mathematics teachers were not trained to teach remedial education.

6. That over fifty percent of the students who enrolled in remedial mathematics classes failed to complete the course.
In an evaluative study of the remedial mathematics program at Rhode Island College, Providence, Rhode Island, O'Regan (1966) compared two groups of students: the experimental comprised of students who took the remedial course in algebra during the summer session of 1964 and then enrolled in the freshman mathematics; the control group comprised of students with the same mathematics background as those in the experimental but who instead of taking the remedial program enrolled in the freshman mathematics in the fall of 1964. His findings were that a high level of proficiency in algebra was not a prerequisite to success in freshman mathematics. Furthermore, he concluded that remedial work in algebra, immediately preceding freshman mathematics, did not appear to contribute to success in that course. In fact, he stated that such remedial work may reduce the student's level of success in freshman mathematics.

Basic Mathematics Review (BMR) is a remedial non-credit course at Essex Community College (Maryland) being taught on an individualized basis. Evaluation by Bloomberg (1971), of the new individualized BMR and comparison with the traditional remedial course resulted in several conclusions: (1) students succeeding in BMR achieved significantly higher in credit mathematics courses than students not required to take BMR; (2) students who did not pass BMR, but took credit mathematics courses, failed to achieve above "D" grades; (3) a greater percentage of students re-enrolled after failing BMR than those who failed the traditional course; (4) withdrawal percentages in credit mathematics courses were lower for BMR graduates than for those not required to take BMR; (5) a smaller percentage
of students passed individualized BMR than the traditional remedial course, and (6) students who re-enrolled in BMR after failing had about the same rate of success as first-time students.

In a study to determine the effectiveness of remedial courses in the junior college, Sharon (1970) compared three groups of students: (1) those needing to take remedial courses but placed in regular courses, (2) those who enrolled in regular courses after passing remedial courses, and (3) those who did not require remediation. Comparisons were made on ability, interest, motivation, persistence, and performance. Some of the conclusions Sharon arrived at were (1) the mathematics remedial course eliminated some of the dissatisfaction with the regular course and had a significant effect on subsequent course work, and (2) the placement procedures appeared to be more effective in assigning students to appropriate mathematics than to English.

Riggle (1975) designed a study to determine the attitudes, perceived needs, and recommendations of the students enrolled in the developmental mathematics program at the Metropolitan Campus of Cuyahoga Community College (Ohio). The program had consisted of three courses of individualized instruction. A pretest was given to determine proper course placement and all modular units were accompanied by regular lectures. A stratified sample of 91 students (6.4 percent of the total developmental mathematics class) was selected for the study. Results of the study indicated a general satisfaction with the program. However, many students did not use the supplementary services and many had never heard of them. The author recommended
that (1) each student be given a tour and an explanation of the facilities and services, (2) all students be required to take the placement test, (3) sample unit tests be available for student review, and (4) tutors become familiar with tests used in class.

The remedial program at William Rainey Harper Community College was established to prepare the academic low-achievers, those college freshmen who were in the lowest quintile of their high school graduation class, for regular college level courses. The program was mainly a learning laboratory for those freshmen students who showed deficiencies in their background in mathematics, English, and reading. Papandrea (1974) evaluated the effects of the learning laboratory program on academic achievement and self-concept of the youngsters in the program. He compared two groups of freshmen students enrolled in the program during the 1973-74 academic year. A total of 170 students constituted the population. The control group consisted of students who were identified as learning laboratory students but chose a non-learning laboratory academic program. One of his major findings was that, when the control group was compared with the experimental, the analysis of the data indicated significant change (p < .01) that favored the control group in the academic achievement in arithmetic. He stated that there was no evidence in the study to support the claim that the learning laboratory affected the participants' self-concept. He did indicate that the attrition rate varied depending upon the learning laboratory in question, but that it was low in the reading laboratory, which suggested that improvement in reading might be an essential variable in students wanting to complete the reading learning program.
At El Paso Community College, entering students were required, unless waived, to take placement examinations in mathematics, English, and reading before receiving their initial counseling. Using scores made in these examinations, counselors placed students into those courses for the first semester. When their scores suggested that students were not functioning at the college level, counselors placed those students into the appropriate remedial-compensatory or skills courses in order to upgrade their academic functioning level. In their evaluation of the remedial program, Rodwick and Grady (1976) attempted to provide answers to five questions, one of which was: If a student completed a remedial-compensatory course sequence, could he be successful in core courses such as the 100-level course in mathematics or English in his academic major?

In an attempt to answer the above and other questions, data were gathered on over 1,400 students on the following variables: sex, age, ethnic characteristics, years of formal schooling, and grades made in compensatory or 100-level courses in mathematics, English and reading. One of the findings of the study was that students who took one or more skills courses were competitive with students whose placement scores allowed them to take 100-level courses immediately. They, therefore, recommended that the Skills Department be funded to serve more students in need of reading, mathematics, and English pre-college skills. However, they suggested that alternative methodologies be explored to further improve the program effectiveness and efficiency.

Bucks County Community College's Department of Basic Studies is a comprehensive developmental education program which involves work
for credit in basic academic skills — reading, study skills, writing and mathematics. During the 1973-74 academic year, Rosella (1975) conducted an evaluative study of the Basic Studies Program. Students included in the study ranked in the bottom 40 percent of their high school graduating class and scored at or below the 25th percentile on the placement test. Two groups of students were compared. Eighty-six students participating in the Basic Studies Program constituted the experimental group and 97 nonparticipants made up the control group. Some of the findings of the investigation were that students in the experimental group earned higher grade point averages, had greater rates of persistence and were more successful in English and mathematics courses than those in the control group. Basic Studies students did better in all categories measured. The evidence appeared to strongly point to the generalized effect of the program rather than to any particular course.

The University of Illinois at Champaign-Urbana first admitted students to its Special Educational Opportunities Program (SEOP) in September, 1968. Through the SEOP, the University opened educational opportunities to disadvantaged students residing in Illinois who would otherwise probably not gain access to college. The University also viewed the SEOP as an educational enterprise that could yield information for institutional self-study and for dissemination to other institutions of higher education planning college programs for disadvantaged students. The courses offered in the SEOP included a basic mathematics course, rhetoric, a writing laboratory course, and a general psychology course. The main SEOP objective was graduation and not merely early success.
Bowers (1971) conducted an evaluative investigation that attempted to provide an answer to the following question: "How do the mean grade levels of SEOP and regularly admitted students compare over time as both groups progress through the university?" One of the groups used in the study was made of 625 freshmen admitted to the SEOP in the fall of 1968 and in the fall of 1969. The other was made of 9,796 regularly admitted 1968 and 1969 beginning freshmen. In his concluding remarks, Bowers stated that although the grade point averages for regularly admitted students were unstable, those of the SEOP were more unstable. Bowers pointed out two factors that tended to cause the instability of the grade point averages of the SEOP students. He said tests routinely used by the University of Illinois were appropriate for regularly admitted freshmen, who enrolled under extremely selective admissions rules. These tests were typically too difficult for the SEOP freshmen. He suggested that, perhaps, the SEOP students required more time in which to change, more time in which to develop the scholastic habits and learning sets that stabilize grade point averages within the regularly admitted groups.

SUMMARY

The assumption inherent in establishing remedial courses, at whatever level, is that chances for academic success are greatly enhanced for marginal or disadvantaged students because of their having available such programs. Of the 22 studies reviewed, nine studies supported the hypothesis that the programs indeed helped the students remove or remedy their deficiencies. The findings of eight
studies indicated that the programs did not help marginal students to successfully compete with non-marginal or non-disadvantaged students and results of the other five studies showed ambiguous outcomes of the programs involved.

In all, seven studies were reviewed at the preschool, elementary, and secondary school levels. Of that number, although some studies had serious methodological flaws, the resulting evidence nevertheless suggested that the programs did achieve some of their goals. The other three indicated very little, if any, improvement on the part of the students served. At the post-secondary school levels, 15 studies were reviewed. Six of the 15 were at the college level and nine were at the junior college level. Five studies of the post-secondary school level programs indicated an improvement in performance in the regular college-level courses of the students served. Ten studies resulted in conflicting findings, some pointing to the fact that the programs had been poorly planned and the instructors were not trained to handle remedial teaching. Others indicated that the programs had operated for too short a time to be effectively evaluated.

While there is some evidence to suggest that the remedial or compensatory programs at the preschool, elementary and secondary school levels are enjoying some measure of success, the evidence points the other direction at the post-secondary school levels. From the review two conclusions can be reached: (1) There is a pronounced lack of research on the effectiveness of the remediation efforts at the four year college level in terms of assessing academic performance in regular college-level courses, persistence, and attitudes of high-risk
students. (2) Even with the scarcity of research the evidence indicated that remedial mathematics courses and programs in the four year colleges have largely been ineffective in remedying student deficiencies.
Chapter 3

PROCEDURE

This chapter explains in detail the procedures and design used in this study. They are as follows: (1) setting and subjects of the study, (2) the design of the study, (3) sources of data, and (4) method of data analysis.

SETTING AND SUBJECTS OF THE STUDY

This study was carried out at Louisiana State University, Baton Rouge, Louisiana, during the fall and spring semesters of the 1977-78 school year. The sample was made up of students who completed the remedial Mathematics course 0007 in the fall semester of the 1976-77 academic year and enrolled in the regular Mathematics 1021 in the spring of 1976-77 and students who completed the remedial Mathematics courses 0004 and 0005 in the fall semester of the 1977-78 academic year and enrolled in the regular Mathematics 1021 in the spring semester of the 1977-78 academic year.

Mathematics 0007 was a remedial course designed to bring the academically disadvantaged freshmen students to the level of those freshmen students who were considered to be ready for college-level freshman mathematics courses. It was, at one time, the only remedial mathematics course offered at Louisiana State University. It was offered for a full semester for three hours college credit, and met three hours a week.
In the fall of the 1977-78 academic year, Mathematics 0007 was replaced by two remedial Mathematics courses, 0004 and 0005. In an interview with the Daily Reveille,1 October 11, 1977, Bernard L. Madison, Director of Basic and Applied Mathematics at LSU, said the two new courses were being instituted on a one-year trial basis. He said they would be assessed at the end of the year, and, if successful, they might become permanent. Mathematics 0004 and 0005 meet five days a week for half-semester. Each course carries two and one-half hours university credit, which does not count toward degree requirements.

Mathematics 1021 is a freshman college-level course. According to the 1977-78 LSU General Catalog, it is the first course in college algebra. It meets three times a week, one hour each, and carries three hours university credit.

DESIGN OF STUDY

The focus of the study was the effectiveness of the Mathematics courses 0004 and 0005 as remedial mathematics courses as compared to Mathematics 0007. The design of the investigation, as called by Van Dalen (1973) was "The Non-Randomized Control-Group Pretest Posttest Design." Van Dalen said that to achieve equivalent experimental and control groups rigorously controlled designs require that subjects be assigned to comparison groups at random. He further said that employing randomization procedures was not difficult, but upsetting class schedules, getting scattered subjects to participate,

1Daily Reveille (Louisiana State University), October 11, 1977. p. 11.
and obtaining a sufficiently large sample to insure that the laws of chance would operate could not always be done. Under some circumstances, therefore, an educational experimenter might have to use pre-assembled groups, such as intact classes, for experimental and control groups.

The procedures for carrying out this design were the following: (1) The subjects were not assigned to groups at random, (2) Pre-assembled groups or classes that were as similar as availability permitted were selected. The control group was made up of students who took Mathematics 0007 in the fall semester of the 1976-77 academic year, completed it, and enrolled in Mathematics 1021 in the spring semester of the 1976-77 school year. The experimental group consisted of students who took Mathematics courses 0004 and 0005 in the fall semester of the 1977-78 academic year, completed them, and enrolled in Mathematics 1021 in the spring semester of the 1977-78 academic year. The design was as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Treatment</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Tle</td>
<td>Xa</td>
<td>T2e</td>
</tr>
<tr>
<td>Control</td>
<td>Tlc</td>
<td>Xb</td>
<td>T2c</td>
</tr>
</tbody>
</table>

Xa = Mathematics courses 0004, 0005, and 1021.
Xb = Mathematics courses 0007 and 1021.

The mathematics placement examination scores and the ACT scores in mathematics were used as pretest scores and the quality points of the final grades of Mathematics 1021 were used as the posttest scores.
When the groups were initially selected for the investigation, the control group had 263 students and the experimental group had 300 students. But the number of students in both the control and experimental groups was reduced because some students in the sample did not have mathematics placement scores. The reason was that students who scored 16 or below in the mathematics portion of the ACT were advised in their own interests not to attempt the mathematics placement examinations. Instead they were advised to register in the remedial mathematics courses. However, of the group that scored 16 or below, some insisted on taking the mathematics placement examinations. Those students had mathematics placement scores even though they had ACT scores of 16 or below. On the other hand, some students who had ACT scores above 16 did not attempt the mathematics placement examinations. They registered in the remedial mathematics courses. This group of students did not have mathematics placement scores. This meant that the students who were dropped from the initial groups were not only those who scored 16 or below in the mathematics ACT but also those students who scored above 16 and opted not to attempt the mathematics placement examinations.

After the elimination of the remedial students without mathematics placement examinations scores, the two groups used in the investigation had 235 students for the control and 260 for the experimental, a total of 495 students. Of the 235 in the control, 83 were female students and 152 were male. Of the 260 students in the experimental group, 89 were female students and 171 were male. The number of students involved in the study by sex is presented in Table 1.
Table 1

Distribution of Students Involved in the Study by Sex

<table>
<thead>
<tr>
<th>Group</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>171</td>
<td>89</td>
<td>260</td>
</tr>
<tr>
<td>Control</td>
<td>152</td>
<td>83</td>
<td>235</td>
</tr>
<tr>
<td>Total</td>
<td>323</td>
<td>172</td>
<td>495</td>
</tr>
</tbody>
</table>

SOURCES OF DATA

The sources of data used in this study were as follows:

(a) Files in the mathematics department for the initial selection of the two groups of students that constituted the sample. These files were also used to obtain the final grades of the sample students in Mathematics 1021 and to obtain information on the dropouts.

(b) Files in the Junior Division were used to obtain the mathematics ACT scores and the mathematics placement examinations scores for the students in the study.

METHOD OF DATA ANALYSIS

Because the groups used in the study were not matched in the beginning, the analysis of covariance was used in the data analysis. The final grades in Mathematics 1021 were used as the achievement criterion and the mathematics ACT scores and the mathematics placement
examinations scores were used as covariates. The data were also analyzed on a percentage basis to determine the dropout rates with respect to the students in each of the two groups.
Chapter 4

PRESENTATION AND ANALYSIS OF DATA

The purpose of this chapter is to present and analyze the data on the mathematics phase of the Academic Skills Enhancement Program at Louisiana State University and to evaluate the effectiveness of this program in preparing students for enrollment in the first college algebra course, Mathematics 1021.

The study was originally designed to answer the following questions:

1. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged students who took the college-credit remedial Mathematics course 0007?

2. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged students who took the college-credit remedial Mathematics course 0007?

3. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged male students who took the non-college-credit remedial Mathematics courses 0004 and
0005 and that of the academically disadvantaged students who took the college-credit remedial Mathematics course 0007?

4. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged female students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged female students who took the college-credit remedial Mathematics course 0007?

5. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged male students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged male students who took the college-credit remedial Mathematics course 0007?

6. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged female students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged female students who took the college-credit-remedial Mathematics course 0007?

Students were divided into the following subgroups for the purpose of trying to answer the above questions: group, experimental and control; male and female both in the control and experimental groups.
An analysis of covariance was computed for each subgroup. The F-ratio was tested for significance at the .05 level. Adjusted means were presented for the subgroups along with their mean gains.

ANALYSIS OF DATA ON PERFORMANCE IN THE REGULAR COLLEGE-LEVEL MATHEMATICS 1021 FOR THE EXPERIMENTAL AND CONTROL GROUPS

This section was to respond to question one: Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the students in the experimental group and that of the students in the control group? The analysis in Table 2 showed an F-ratio of 0.57, indicating no significant difference between the performance in the regular-college level Mathematics 1021 of the experimental students and that of the control students. Data presented in Table 3 indicated that the original performance mean of the experimental group had no mean gain while that of the control group was slightly adjusted downward.

SUMMARY

There was no significant difference between the performance in Mathematics 1021 of experimental group and the control group. The adjustment of the performance means was rather trivial since the experimental group had no mean gain and the control group had a slight mean loss.

ANALYSIS OF DATA ON THE DROPOUT RATE FROM MATHEMATICS 1021 FOR THE EXPERIMENTAL GROUP AND CONTROL GROUP

This section was meant to answer question number two: Was there a significant difference between the dropout rate from Mathematics 1021
Table 2

Analysis of Covariance for Performance Differences in Mathematics 1021 Between the Experimental Group and the Control Group

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Degrees of freedom</th>
<th>Sum of squares</th>
<th>Mean square</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>1</td>
<td>0.78</td>
<td>0.78</td>
<td>0.57*</td>
</tr>
<tr>
<td>Within</td>
<td>386</td>
<td>523.10</td>
<td>1.36</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>387</td>
<td>523.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .05 level.

Regression coefficients for Total $b_1 = 0.08009$

\[ b_2 = 0.02822 \]

Regression coefficients for Within $b_1 = 0.07874$

\[ b_2 = 0.02805 \]
Table 3

Distribution of Unadjusted and Adjusted Means of the Students' Performance, the Covariates and Mean Gains

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Performance in Mathematics 1021</th>
<th>Covariates</th>
<th>Mean gain in performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Unadjusted</td>
<td>Adjusted</td>
<td>Mathematics placement</td>
</tr>
<tr>
<td>Experimental</td>
<td>207</td>
<td>1.71</td>
<td>1.71</td>
<td>12.27</td>
</tr>
<tr>
<td>Control</td>
<td>183</td>
<td>1.89</td>
<td>1.82</td>
<td>13.09</td>
</tr>
</tbody>
</table>
among students in the experimental group and that among students in the control group? Table 4 indicated that 53 students or 20.38 percent of the 260 in the experimental group failed to complete the semester of Mathematics 1021. Fifty-two students or 22.13 percent of the 235 in the control group withdrew from Mathematics 1021. The difference between the two percentages was not significant at the .05 level. The critical ratio obtained was less than the 1.96 value.

Table 4

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of students</th>
<th>Number of dropouts</th>
<th>Percentages</th>
<th>C-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>260</td>
<td>53</td>
<td>20.38</td>
<td>0.46*</td>
</tr>
<tr>
<td>Control</td>
<td>235</td>
<td>52</td>
<td>22.13</td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .05 level.

SUMMARY

There was no significant difference between the dropout rate from the regular college-level Mathematics 1021 among the students in the experimental group and that among the students in the control group as indicated by the percentage difference.
ANALYSIS OF DATA ON PERFORMANCE DIFFERENCES IN MATHEMATICS 1021
FOR THE MALE STUDENTS IN THE EXPERIMENTAL GROUP
AND FOR THE MALE STUDENTS IN THE CONTROL GROUP

The purpose of this section was to respond to question number three: Was there a significant difference between the performance in Mathematics 1021 of the male students in the experimental group and that of the male students in the control group? The data were subjected to a single-classification analysis of covariance at the .05 level of significance. Table 5 indicated an F-ratio of .05. This showed that there was no significant difference between the performance in Mathematics 1021 of the male students in the experimental group and that of the male students in the control group. Inspecting Table 6, it was discovered that the experimental group had a positive mean gain in performance in Mathematics 1021 while the control group had a mean loss. The mean difference of 0.01 was not significant.

SUMMARY

Data presented in Tables 5 and 6 showed that there was no significant difference between the performance in the regular college-level Mathematics 1021 of the experimental male students and that of the control male students.

ANALYSIS OF DATA ON PERFORMANCE DIFFERENCES IN MATHEMATICS 1021
FOR THE FEMALE STUDENTS IN THE EXPERIMENTAL GROUP
AND THE FEMALE STUDENTS IN THE CONTROL GROUP

This section was meant to respond to question number four: Was there a significant difference between the performance in the regular college-level Mathematics 1021 of female students in the experimental
Table 5
Analysis of Covariance for Performance Differences in Mathematics 1021
Between the Male Students in the Experimental Group
and the Male Students in the Control Group

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Degrees of freedom</th>
<th>Sum of squares</th>
<th>Mean square</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>1</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01*</td>
</tr>
<tr>
<td>Within</td>
<td>254</td>
<td>360.12</td>
<td>1.42</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>255</td>
<td>360.13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .05 level.

Regression coefficients for Total $b_1 = 0.07618$
$b_2 = 0.03578$

Regression coefficients for Within $b_1 = 0.07613$
$b_2 = 0.03574$
Table 6

Distribution of Unadjusted and Adjusted Means of the Male Students' Performance, the Covariates and Mean Gains

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Performance in Mathematics 1021</th>
<th>Covariates</th>
<th>Mean gain in performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Unadjusted</td>
<td>Adjusted</td>
<td>Mathematics placement</td>
</tr>
<tr>
<td>Experimental</td>
<td>139</td>
<td>1.71</td>
<td>1.73</td>
<td>12.55</td>
</tr>
<tr>
<td>Control</td>
<td>119</td>
<td>1.77</td>
<td>1.74</td>
<td>12.92</td>
</tr>
</tbody>
</table>
group and that of the female students in the control group? The data analysis presented in Table 7 showed an F-ratio of 1.30, indicating no significant difference between the performance in the regular college-level Mathematics 1021 of the female students in the experimental group and that of the female students in the control group. The data in Table 8 showed a mean gain of 0.08 for the female students in the experimental group. The adjustment of the performance mean of the female students in the control group resulted in a mean loss of 0.09.

SUMMARY

There was no significant difference between the performances in the regular college-level Mathematics 1021 of the female students in the experimental group and that of the female students in the control group as indicated by the means in Table 8.

ANALYSIS OF DATA ON THE DROPOUT RATE FROM MATHEMATICS 1021 FOR THE MALE STUDENTS IN THE EXPERIMENTAL AND CONTROL GROUPS

The purpose of this section was to respond to question number five: Was there a significant difference between the dropout rate from Mathematics 1021 among male students in the experimental group and that among male students in the control group? The data in Table 9 showed that, of the 171 male students in the experimental group that registered for Mathematics 1021 at the beginning of the 1977-78 spring semester, 32 students or 18.7 percent withdrew from the course before the end of the semester. Table 9 also indicated
Table 7
Analysis of Covariance for Performance Differences in Mathematics 1021 Between the Female Students in the Experimental Group and the Female Students in the Control Group

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Degrees of freedom</th>
<th>Sum of squares</th>
<th>Mean square</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>1</td>
<td>1.57</td>
<td>1.57</td>
<td>1.30*</td>
</tr>
<tr>
<td>Within</td>
<td>128</td>
<td>155.02</td>
<td>1.21</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>129</td>
<td>156.59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .05 level.

Regression coefficients for Total $b_1 = 0.109069905$

$b_2 = 0.005131687$

Regression coefficients for Within $b_1 = 0.100880492$

$b_2 = 0.006024057$
Table 8

Distribution of Unadjusted and Adjusted Means of the Female Students' Performance, the Covariates and Mean Gains

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Performance in Mathematics 1021</th>
<th>Covariates</th>
<th>Mean gain in performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Unadjusted</td>
<td>Adjusted</td>
<td>Mathematics placement</td>
</tr>
<tr>
<td>Experimental</td>
<td>68</td>
<td>1.72</td>
<td>1.80</td>
<td>11.84</td>
</tr>
<tr>
<td>Control</td>
<td>64</td>
<td>2.11</td>
<td>2.02</td>
<td>13.41</td>
</tr>
</tbody>
</table>
that of the 152 male students in the control group that enrolled in Mathematics 1021 at the beginning of the 1976-77 spring semester or 21.7 percent dropped out from the course before the end of the semester. The critical ratio obtained for the difference between the two percentages was 0.67. This was less than 1.96 (.05 level), indicating that the obtained percentage difference was not significant.

Table 9

Distribution and Percentages of Dropouts from Mathematics 1021 for the Male Students in the Experimental and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of male students</th>
<th>Number of dropouts</th>
<th>Percentages</th>
<th>C-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>171</td>
<td>32</td>
<td>18.7</td>
<td>0.67*</td>
</tr>
<tr>
<td>Control</td>
<td>152</td>
<td>33</td>
<td>21.7</td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .05 level.

SUMMARY

There was no significant difference between the dropout rate from the regular college-level Mathematics 1021 among male students in the experimental group and that among male students in the control group.

ANALYSIS OF DATA ON THE DROPOUT RATE FROM MATHEMATICS 1021 FOR THE FEMALE STUDENTS IN THE EXPERIMENTAL AND CONTROL GROUPS

This section was to address question number six: Was there a significant difference between the dropout rate from Mathematics 1021
among the female students in the experimental group and that among the female students in the control group? The data in Table 10 showed that, of the 89 female students in the experimental group that enrolled in Mathematics 1021 at the beginning of the 1977-78 spring semester, 21 dropped out from the course before the final examination for the course. That was 23.5 percent of the female students that started the course. Nineteen of the 83 female remedial students in the control group that enrolled in the regular college-level Mathematics 1021 at the beginning of the 1976-77 spring semester withdrew from the course. That number was 22.9 percent of the female students that initially enrolled. Further analysis of the difference between the two percentages of the dropouts resulted in a critical ratio of 0.09. This ratio was less than 1.96 (.05 level), showing that the difference between the two percentages of dropouts was not significant.

SUMMARY

There was no significant difference between the dropout rate from the regular college-level Mathematics 1021 among female students in the experimental group and that among female students in the control group.
Table 10
Distribution and Percentages of Dropouts from Mathematics 1021 for the Female Students in the Experimental and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of female students</th>
<th>Number of dropouts</th>
<th>Percentages</th>
<th>C-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>89</td>
<td>21</td>
<td>23.5</td>
<td>.09*</td>
</tr>
<tr>
<td>Control</td>
<td>83</td>
<td>19</td>
<td>22.9</td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .05 level.

SUMMARY OF FINDINGS

There was no significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged students who took the college-credit remedial Mathematics course 0007.

There was no significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged students who took the college-credit remedial Mathematics course 0007.

There was no significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged male students who took the non-college-credit remedial Mathematics courses 0004 and 0005, and that of the academically
disadvantaged male students who took the college-credit remedial Mathematics course 0007.

There was no significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged female students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged female students who took the college-credit remedial Mathematics course 0007.

There was no significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged male students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged male students who took the college-credit remedial Mathematics course 0007.

There was no significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged female students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged female students who took the college-credit remedial Mathematics course 0007.

All the analyses carried out resulted in positive regression coefficients.
Chapter 5

SUMMARY, CONCLUSIONS, AND SUGGESTIONS

The purpose of this study was to compare certain aspects of two remedial mathematics programs at Louisiana State University. More specifically, this investigation sought to determine which of the two remedial mathematics programs considered was more effective in preparing academically disadvantaged students to perform in college-level mathematics courses. In this chapter is presented a summary of this study, conclusions reached, and some suggestions.

SUMMARY

With college enrollments increasing and the numbers of entering freshmen students who are marginally or inadequately prepared to handle college-level work reaching alarming proportions, educators have tried several alternatives in attempting to provide solutions to the question, "What is to be done about the academically disadvantaged students?" One of the alternatives that is being used is the introduction of comprehensive and systematic programs that would prepare these academically disadvantaged students in skills necessary for success in regular college-level classes. These programs carry different labels in different universities and colleges. At Louisiana State University, the program is labelled the Academic Skills Enhancement Program. It is subdivided into the following skills areas: writing skills, quantitative skills, reading skills, speaking skills, and study skills.
Specifically, this study was designed to answer the following questions concerning the quantitative skills instructional area of the Academic Skills Enhancement Program:

1. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged students who took the college-credit remedial Mathematics course 0007?

2. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged students who took the college-credit remedial Mathematics course 0007?

3. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged male students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that of the academically disadvantaged male students who took the college-credit remedial Mathematics course 0007?

4. Was there a significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged female students who took the non-college-credit remedial Mathematics courses 0004 and
0005 and that of the academically disadvantaged female students who took the college-credit remedial Mathematics course 0007?

5. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged male students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged male students who took the college-credit remedial Mathematics course 0007?

6. Was there a significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged female students who took the non-college-credit remedial Mathematics courses 0004 and 0005 and that among the academically disadvantaged female students who took the college-credit remedial Mathematics course 0007?

The sample used in this investigation consisted of 495 freshmen students at Louisiana State University, Baton Rouge Campus, who:

1. Because of their mathematics ACT scores and their scores in the mathematics placement examinations, were required to take the remedial Mathematics course 0007 in the fall of 1976 prior to enrolling in the regular college-level Mathematics 1021 in the spring of 1977.

2. Because of their mathematics ACT scores and their scores in the mathematics placement examinations, were required to take the remedial Mathematics courses 0004 and 0005 in the fall of 1977 prior to enrolling in the regular college-level Mathematics 1021 in the spring of 1978.
The remedial students who took the college-credit remedial Mathematics course 0007 constituted the control group. Those who took the non-college-credit remedial Mathematics courses 0004 and 0005 made up the experimental group. The final grades received by the students in Mathematics 1021 served as the performance criterion. There were 260 students in the experimental group and 235 in the control group.

The design of the investigation dictated the use of the following types of statistics:

1. Because the groups of freshmen students used in the study were preassembled and there was no attempt on the part of the investigator to equate the two groups in terms of entry mathematics skills, the analysis of covariance was used to analyze data pertaining to questions number one, three, and four. The covariates were the mathematics ACT scores and the mathematics placement examination scores.

2. To analyze data pertaining to questions number two, five and six, percentages were calculated and the critical ratios of the differences between those percentages were found.

Analysis of data pertaining to questions number one, three, and four resulted in the following findings:

1. There was no significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged students in the experimental group and that of the academically disadvantaged students in the control group. The F-ratio was .05.
2. There was no significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged male students in the experimental group and that of the academically disadvantaged male students in the control group. The F-ratio was .01.

3. There was no significant difference between the performance in the regular college-level Mathematics 1021 of the academically disadvantaged female students in the experimental group and that of the academically disadvantaged female students in the control group. The F-ratio was 1.30.

After analyzing the data pertaining to questions number two, five, and six, it was found that:

1. There was no significant difference in the dropout rate from Mathematics 1021 among the academically disadvantaged students in the experimental group and that among the academically disadvantaged students in the control group. The critical ratio was .46.

2. There was no significant difference in the dropout rate from Mathematics 1021 among the academically disadvantaged male students in the experimental group and that among the academically disadvantaged male students in the control group. The critical ratio was .67.

3. There was no significant difference between the dropout rate from Mathematics 1021 among the academically disadvantaged female students in the experimental group and that among the academically disadvantaged female students in the control group. The critical ratio was .09.

Another interesting finding was that all the regression coefficients for all the areas of the study were positive.
CONCLUSIONS

From a consideration of the findings and within the limitations of this study, the following conclusions were reached:

1. The introduction of the remedial Mathematics courses 0004 and 0005 did not significantly improve the performance in the regular college-level Mathematics 1021 of the academically disadvantaged students as measured by grades earned between the experimental group and the control group.

2. The dropout rate from Mathematics 1021 of the two groups, the academically disadvantaged students who took the remedial Mathematics courses 0004 and 0005 and those who took the remedial Mathematics course 0007, were not significantly different.

3. The performance in the regular college-level Mathematics 1021 of the academically disadvantaged male students who took the remedial Mathematics courses 0004 and 0005 did not differ significantly from the performance in Mathematics 1021 of the academically disadvantaged male students who took the remedial Mathematics course 0007.

4. There was also no significant difference between the performance in the regular college-level Mathematics 1021 of the female students in the experimental group and that of the female students in the control group.

5. The dropout rate from Mathematics 1021 of the academically disadvantaged male students who took the remedial Mathematics courses 0004 and 0005 did not differ significantly from that of the academically disadvantaged male students who took the remedial Mathematics course 0007.
6. The academically disadvantaged female students who took the remedial Mathematics courses 0004 and 0005 had a dropout rate from the regular college-level Mathematics 1021 that was not significantly different from the dropout rate of the academically disadvantaged female students that took the remedial Mathematics course 0007.

The positive regression coefficients revealed by all the areas of the study indicated that, on the average, students with higher mathematics ACT scores and mathematics placement scores generally performed better in the regular college-level Mathematics 1021 than those who had lower mathematics ACT and lower mathematics placement scores.

SUGGESTIONS

From the data obtained and analyzed in this study, the following suggestions were made:

1. Because of the limited number of students involved in the present study, it is suggested that more research should be done with a larger number of students to further determine the effects of the remedial mathematics program on the performance in the regular college-level mathematics courses of the academically disadvantaged students. The research should be longitudinal and geared toward finding how many of the remedial students complete the college requirements in their respective fields and graduate from the University.

2. For the improvement of the program, it is suggested that:

   (a) There is a need for increased training and orientation for the tutors to better prepare them in handling their tutorial duties. A program more closely tied to actual classroom work, where tutors are
aware of both course content and teaching techniques should be
implemented.

(b) Diagnostic testing should be done at the beginning
of the remedial semester to isolate the areas in which the students
are deficient. Once those areas have been identified, prescriptive
work should be developed for each student covering his or her
deficiency. This cycle should continue until the end of the semester.

(c) The remedial mathematics program should continue to
emphasize basic arithmetic and elementary algebraic concepts.

In closing, it should be pointed out that the Mathematics
Department has taken on a difficult task. It is attempting, in a one
semester program, to complete what the high school curriculum
traditionally accomplishes in more than two years. This task is
further complicated by the large number of academically disadvantaged
freshmen students that the program has to serve. Therefore, any success
with which the students and the Department have met should be welcomed
and any failures in these developmental years should be used as an
indication for program modification and change, and not for any
decision making on funding and continuation of the program.
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BOOKS


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Tokhein, John B. "The Effectiveness of a Remedial Course in English Composition for Freshmen at Stout State University." Nov., 1968. Ed. 054 159.

UNPUBLISHED MATERIALS


APPENDIX A

MATHEMATICS PLACEMENT EXAMINATION 1977-78 FALL SEMESTER
Diagnostic Examination

**DIRECTIONS:** Work each problem. Then look at the possible answers and see if your answer is given. If it is, fill in the space on your answer sheet with the same letter as your answer. If your answer is not given (NG), fill in the space on your answer sheet with the letter E. Do not write on these question sheets. Do not write on these question sheets. Do all your work on the scratch paper supplied and put your answers on the answer sheet.

Finish working Part I (problems 1-20) before going on to Part II (problems 21-27). Finish Part II before going on to Part III (problems 28-32). If you run short of time, do not rush to complete Parts II and III.

**PART I**

1. \( \frac{2}{3} + \frac{3}{4} = \)
   - A. \( \frac{5}{7} \)  
   - B. \( 1 \frac{1}{2} \)  
   - C. \( \frac{5}{12} \)  
   - D. \( \frac{17}{12} \)  
   - E. NG

2. \( \frac{5}{3} \cdot \left( \frac{3}{10} \div \frac{7}{2} \right) = \)
   - A. \( \frac{7}{4} \)  
   - B. \( \frac{1}{7} \)  
   - C. \( \frac{100}{63} \)  
   - D. \( \frac{4}{7} \)  
   - E. NG

3. \( \frac{-6 + (-8)}{1 - (-6)} = \)
   - A. \(-8\)  
   - B. \(-2\)  
   - C. \(2\)  
   - D. \(8\)  
   - E. NG

4. \((-3)^2 + -7 = \)
   - A. \(-16\)  
   - B. \(2\)  
   - C. \(-2\)  
   - D. \(16\)  
   - E. NG

5. \(4 \left( 2(3 + 7) - 13 \right) = \)
   - A. \(67\)  
   - B. \(-50\)  
   - C. \(28\)  
   - D. \(-24\)  
   - E. NG
6. What is the solution to the following equation?

\[ 2x + 3 = -5 \]

A. \( x = 0 \)  
B. \( x = 4 \)  
C. \( x = -4 \)  
D. \( x = -1 \)  
E. NG

7. What is the solution to the following equation?

\[ -2x - 7 + 3(x - 1) = 2 \]

A. \( x = 10 \)  
B. \( x = 12 \)  
C. \( x = 2 \)  
D. \( x = -10 \)  
E. NG

8. Let \( x \) stand for John’s present age and \( y \) stand for Larry’s present age. John is now twice as old as Larry will be 4 years from now. Hence:

A. \( x = 2(y + 4) \)  
B. \( x = 2(y - 4) \)  
C. \( y = 2(x + 4) \)  
D. \( y = 2(x - 4) \)  
E. NG

9. Add \( 3x^2 - 5x + 2 \) and \( 2x^2 + 8x - 4 \).

A. \( 6x^4 - 40x^2 - 8 \)  
B. \( 6x^2 + 13x - 8 \)  
C. \( 5x^2 + 3x - 2 \)  
D. \( x^2 - 13x + 6 \)  
E. NG

10. Subtract \(-10y\) from \(-12y\).

A. \(-2y\)  
B. \(-22y\)  
C. \(-120y\)  
D. \(+2y\)  
E. NG

11. Multiply \(-3x^2y\) by \(-5xy^2\).

A. \( 8x^2y^2 \)  
B. \( 15 + x^3 + y^3 \)  
C. \(-8xy\)  
D. \( 15x^3y^3 \)  
E. NG
12. Multiply $2x + 4$ by $x - 3$.

A. $2x^2 - 12$  
B. $2x^2 - 2x - 12$  
C. $3x + 1$  
D. $x + 7$  
E. NG  

13. Divide $18a^3$ by $-6a$.

A. $-12a^2$  
B. $-3a^2$  
C. $\frac{1}{-3a^2}$  
D. $24a^4$  
E. NG  

14. Simplify $\frac{15x^2y^2 - 10x^4y}{5xy}$.

A. $3xy^2 - 2x^3$  
B. $x^5y^3$  
C. $20x^3y^4 - 15x^5y^2$  
D. $10xy^2 - 5x^3y$  
E. NG  

15. Factor completely: $2x^2z - 6xz^2$.

A. $x^2(2z - 6x)$  
B. $2xz(x - 3z)$  
C. $(2x - 6)(xz + xz^2)$  
D. $2x^2(z - 3z^2)$  
E. NG  

16. Factor completely: $x^2 + 5x + 6$.

A. $(x - 2)(x - 3)$  
B. $(x + 1)(x + 6)$  
C. $(x - 1)(x + 6)$  
D. $(x + 2)(x + 3)$  
E. NG
17. \( \left( \frac{2x-3}{y^2} \right)^{-2} = \)

A. \( \frac{4x^5}{y^4} \)  
B. \( \frac{x^6}{4y} \)  
C. \( \frac{4x^6}{y^4} \)  
D. \( \frac{2x^5}{y^2} \)  
E. NG

18. What are the solutions to the following equation?

\((x + 2)(x + 5) = 0\)

A. -2 and -5  
B. 2 and 5  
C. 0 and 10  
D. -2 and 5  
E. NG

19. \((4y - 7x)(2y - 5x) = \)

A. \(8y^2 - 37yx + 35x^2\)  
B. \(8y^2 + 35x^2\)  
C. \(8y^2 - 6xy - 35x^2\)  
D. \(8y^2 - 37xy - 35x^2\)  
E. NG

20. Factor completely: \(5x^2 + 11x + 2\)

A. \((5x - 1)(x - 2)\)  
B. \((5x + 1)(x + 2)\)  
C. \((5x + 1)(x + 1)\)  
D. \((5x - 2)(x - 1)\)  
E. NG

PART II

21. Factor completely: \(x^2 + 2x + yx + 2y\)

A. \((x + y)(x - 2y)\)  
B. \((x - y)(x - 2)\)  
C. \((x + y)(x + 2)\)  
D. \((x + 2y)(x - y)\)  
E. NG
22. \[
\frac{x^2 + 4x + 4}{2x + 4} = 
\] 
A. \(\frac{x + 4}{2}\)  
B. \(\frac{x + 2}{2}\)  
C. \(x^2 + 2x + 1\)  
D. \(x^2 + 2\)  
E. NG

23. Which of the following is equal to \(\frac{\sqrt{12}}{\sqrt{7}}\)? 
A. \(\frac{\sqrt{84}}{\sqrt{7}}\)  
B. \(\frac{2\sqrt{3}}{7}\)  
C. \(\frac{2\sqrt{21}}{7}\)  
D. \(\frac{12}{7}\)  
E. NG

24. \(\frac{3}{x} + \frac{2}{y} = \) 
A. \(\frac{5}{x + y}\)  
B. \(\frac{5}{xy}\)  
C. \(\frac{3y + 2x}{xy}\)  
D. \(3y + 2x\)  
E. NG

25. What is the solution of the following equation: \(\frac{x}{2} + \frac{x}{3} = 5\) 
A. \(x = 1\)  
B. \(x = -1\)  
C. \(x = 6\)  
D. \(x = 25\)  
E. NG

26. What are the solutions to the following equation? 
\(x^2 + 2x - 8 = 0\) 
A. -1 and 8  
B. 2 and -4  
C. -2 and 4  
D. 2 and 4  
E. NG

27. \(\frac{3x}{x^2 - 4} + \frac{2}{x + 2} = \) 
A. \(\frac{5x - 4}{x^2 - 4}\)  
B. \(\frac{3x + 2}{x^2 - 4}\)  
C. \(\frac{3}{x - 4}\) \(\frac{1}{x}\)  
D. \(\frac{5x + 2}{x^2 - 4}\)  
E. NG
PART III

28. \( \frac{a - b}{a} - \frac{a^2 - b^2}{a^2} = \)

A. \( \frac{a + b}{a^2} \)  
B. \( \frac{a^2 - b^2}{a^2} \)  
C. \( \frac{a - b}{a + b} \)  
D. \( \frac{a}{a + b} \)  
E. NG

29. \( \frac{x + 3}{\frac{1}{x} + \frac{3}{x}} = \)

A. 1  
B. 3x  
C. \( \frac{x + 3}{3x} \)  
D. 3x(x + 3)  
E. NG

30. \( 2\sqrt{18} + \sqrt{97} = \)

A. \( \sqrt{134} \)  
B. 27  
C. \( \sqrt{170} \)  
D. 13\( \sqrt{2} \)  
E. NG

31. What are the solutions to the following equation?
\[ x^2 - 2x - 1 = 0 \]

A. 1 and -1  
B. 1 + \( \sqrt{2} \) and -1 + \( \sqrt{2} \)  
C. 1 - \( \sqrt{2} \) and 1 + \( \sqrt{2} \)  
D. 1 and 2  
E. NG

32. What are the solutions to the following equation?
\[ x^2 + 2x + 2 = 0 \]

A. -1 + i and -1 -i  
B. 1 + i and 1 - i  
C. 1 and 2  
D. -2 + 2i and -2 -2i  
E. NG
APPENDIX B

TABLES INDICATING THE DISTRIBUTIONS OF GRADES IN MATHEMATICS 1021
### Table 11

**Distribution of Grades Among Students in the Experimental Group**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of students</th>
<th>Sum of quality points</th>
<th>Sum of placement points</th>
<th>Sum of ACT points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>13</td>
<td>52</td>
<td>169</td>
<td>241</td>
</tr>
<tr>
<td>B</td>
<td>41</td>
<td>123</td>
<td>583</td>
<td>739</td>
</tr>
<tr>
<td>C</td>
<td>66</td>
<td>132</td>
<td>808</td>
<td>1,096</td>
</tr>
<tr>
<td>D</td>
<td>47</td>
<td>47</td>
<td>574</td>
<td>794</td>
</tr>
<tr>
<td>F</td>
<td>40</td>
<td>0</td>
<td>406</td>
<td>564</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>207</td>
<td>354</td>
<td>2,540</td>
<td>3,434</td>
</tr>
</tbody>
</table>

There were 53 dropouts.

### Table 12

**Distribution of Grades Among Students in the Control Group**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of students</th>
<th>Sum of quality points</th>
<th>Sum of placement points</th>
<th>Sum of ACT points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24</td>
<td>96</td>
<td>337</td>
<td>464</td>
</tr>
<tr>
<td>B</td>
<td>33</td>
<td>99</td>
<td>451</td>
<td>608</td>
</tr>
<tr>
<td>C</td>
<td>57</td>
<td>114</td>
<td>771</td>
<td>1,005</td>
</tr>
<tr>
<td>D</td>
<td>36</td>
<td>36</td>
<td>470</td>
<td>611</td>
</tr>
<tr>
<td>F</td>
<td>33</td>
<td>0</td>
<td>366</td>
<td>486</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>183</td>
<td>345</td>
<td>2,395</td>
<td>3,174</td>
</tr>
</tbody>
</table>

There were 52 dropouts.
Table 13

Distribution of Grades Among Male Students in the Experimental Group

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of students</th>
<th>Sum of quality points</th>
<th>Sum of placement points</th>
<th>Sum of ACT points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>40</td>
<td>130</td>
<td>189</td>
</tr>
<tr>
<td>B</td>
<td>28</td>
<td>84</td>
<td>418</td>
<td>507</td>
</tr>
<tr>
<td>C</td>
<td>40</td>
<td>80</td>
<td>504</td>
<td>707</td>
</tr>
<tr>
<td>D</td>
<td>33</td>
<td>33</td>
<td>399</td>
<td>548</td>
</tr>
<tr>
<td>F</td>
<td>28</td>
<td>0</td>
<td>294</td>
<td>401</td>
</tr>
<tr>
<td>Total</td>
<td>139</td>
<td>237</td>
<td>1,745</td>
<td>2,352</td>
</tr>
</tbody>
</table>

There were 32 dropouts.

Table 14

Distribution of Grades Among Female Students in the Experimental Group

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of students</th>
<th>Sum of quality points</th>
<th>Sum of placement points</th>
<th>Sum of ACT points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3</td>
<td>12</td>
<td>39</td>
<td>52</td>
</tr>
<tr>
<td>B</td>
<td>13</td>
<td>39</td>
<td>175</td>
<td>232</td>
</tr>
<tr>
<td>C</td>
<td>26</td>
<td>52</td>
<td>304</td>
<td>389</td>
</tr>
<tr>
<td>D</td>
<td>14</td>
<td>14</td>
<td>175</td>
<td>246</td>
</tr>
<tr>
<td>F</td>
<td>12</td>
<td>0</td>
<td>112</td>
<td>163</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>117</td>
<td>805</td>
<td>1,082</td>
</tr>
</tbody>
</table>

There were 21 dropouts.
Table 15
Distribution of Grades Among Male Students in the Control Group

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of students</th>
<th>Sum of quality points</th>
<th>Sum of placement points</th>
<th>Sum of ACT points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>14</td>
<td>56</td>
<td>191</td>
<td>276</td>
</tr>
<tr>
<td>B</td>
<td>22</td>
<td>66</td>
<td>288</td>
<td>397</td>
</tr>
<tr>
<td>C</td>
<td>30</td>
<td>60</td>
<td>415</td>
<td>571</td>
</tr>
<tr>
<td>D</td>
<td>28</td>
<td>28</td>
<td>366</td>
<td>478</td>
</tr>
<tr>
<td>F</td>
<td>25</td>
<td>0</td>
<td>277</td>
<td>365</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>210</td>
<td>1,537</td>
<td>2,087</td>
</tr>
</tbody>
</table>

There were 33 dropouts.

Table 16
Distribution of Grades Among Female Students in the Control Group

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of students</th>
<th>Sum of quality points</th>
<th>Sum of placement points</th>
<th>Sum of ACT points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>40</td>
<td>146</td>
<td>188</td>
</tr>
<tr>
<td>B</td>
<td>11</td>
<td>33</td>
<td>163</td>
<td>211</td>
</tr>
<tr>
<td>C</td>
<td>27</td>
<td>54</td>
<td>356</td>
<td>434</td>
</tr>
<tr>
<td>D</td>
<td>8</td>
<td>8</td>
<td>104</td>
<td>133</td>
</tr>
<tr>
<td>F</td>
<td>8</td>
<td>0</td>
<td>89</td>
<td>121</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>135</td>
<td>858</td>
<td>1,087</td>
</tr>
</tbody>
</table>

There were 19 dropouts.
VITA

Bampia Adikalie Bangura, the son of Alhajie Adikalie Bangura and the late Monday Bangura, was born in Kalenkay, Kambia District, Sierra Leone, West Africa, on September 12, 1948.

He attended the Ahmadiyya Elementary School, Rokupr, Sierra Leone. After graduating from Kolenten Secondary School, Kambia, Sierra Leone, he entered Njala University College, the University of Sierra Leone, where he received a Bachelor of Science degree in 1971.

He taught mathematics in Kolenten Secondary School from 1971 to 1974. During this period, he served as Head of the Mathematics Department, Athletics Director and acting Vice Principal in the 1973-74 academic year. The Master of Science degree in Mathematics-Education was awarded to him by the North Carolina Agricultural and Technical State University, Greensboro in May 1975. He did further graduate work in Education at the University of North Carolina at Greensboro in 1976. In January 1977, he entered the Graduate School of Louisiana State University to pursue studies toward the degree of Doctor of Education.

He is married to Aminata Mma Bangura, daughter of Alhajie Santigie Kamara and Mma Kamara of Rokupr, Sierra Leone.
Candidate: Bampia Adikalie Bangura

Major Field: Education

Title of Thesis: An Evaluation of the Mathematics Phase of the Academic Skills Enhancement Program at Louisiana State University

Approved:

B. J. Besson
Major Professor and Chairman

Carolyn H. Hargrove
Dean of the Graduate School

EXAMINING COMMITTEE:

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J. W. Finberg

Richard A. Museweke

Eric L. Thurston

Date of Examination: 10-31-78