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THE EFFECTS OF A PROPOSED REMEDIAL PROGRAM IN
ALGEBRA ON THE ACADEMIC ACHIEVEMENT OF FIRST YEAR
HIGH SCHOOL STUDENTS OF BENEDICTINE ABBEY SCHOOL:
SCHOOL YEAR 1988-1989

A Thesis Presented to
The Faculty of the Graduate School
De La Salle University

In Partial Fulfillment
of the Requirement for the Degree of
Master of Science in Teaching
Major in Mathematics

by

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Republic of the Philippines
MINISTRY OF EDUCATION, CULTURE & SPORTS
National Capital Region
Metro Manila

THESIS ABSTRACT

TITLE: THE EFFECTS OF A PROPOSED REMEDIAL PROGRAM IN ALGEBRA ON THE ACADEMIC ACHIEVEMENT OF FIRST YEAR HIGH SCHOOL STUDENTS OF BENEDICTINE ABBEY SCHOOL: SCHOOL YEAR 1988 - 1989

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SCHOOL: De La Salle University

SUBJECT AREA: Mathematics

DEGREE COVERED: Master of Science in Teaching

MAJOR IN: Mathematics

STATEMENT OF THE PROBLEM:

Main Problem:

It was the aim of this study to determine the effects of a proposed remedial program in high school Elementary Algebra on the academic achievement of first year students of Benedictine Abbey School for the school year 1988 - 1989.



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Sub-Problem:

Specifically, it aimed to answer the following questions grouped by areas:

1. Needs Assessment

1.1 What are the prevailing strengths and weaknesses of the first year Benedictine Abbey School and Elizabeth Seton School students in mathematics?

2. Program Development

2.1 Based on the strengths and weaknesses of the students, what developmental lessons and activities could be included in the proposed remedial program?

3. Program Evaluation

3.1 What are the effects of the proposed and the traditional remedial programs on the academic achievement in Elementary Algebra of the slow learners as inferred from the answers to the following questions:

3.1.1 Is there a significant difference in the academic achievement of the experimental group of slow learners before and after undergoing the proposed remedial program?

3.1.2 Is there a significant difference in the academic achievement of the control group of slow learners before and after undergoing the traditional remedial program?

3.1.3 Is there a significant difference in the academic achievement in Elementary Algebra of the slow learners who were subjected to the proposed remedial program and those who were subjected to the traditional remedial program?

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3.2 How did the experimental group assessed the proposed remedial program in terms of the following:

3.2.1 Coverage of the subject matter

3.2.2 Facilitators'

- a. ability to communicate
- b. knowledge of the subject matter
- c. ability to facilitate

3.2.3 Instructional methodology

3.2.4 Participant involvement

3.2.5 Time allotment for activity

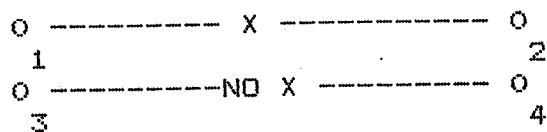
3.2.6 Program venue

3.2.7 The program features they like best/least

PROCEDURE

This study made use of two research designs namely, the RESEARCH and DEVELOPMENT (R&D) DESIGN and the PRE-TEST - POST-TEST CONTROL GROUP EXPERIMENTAL DESIGN.

This was primarily a research and development study because the proposed remedial program was developed after finding out the strengths and weaknesses of the students taking up first year remedial Mathematics. The proposed program was then implemented or field tested and subsequently evaluated by means of an experiment using the PRE-TEST - POST-TEST GROUP DESIGN. Based on this design, the control and the experimental groups were given pre-tests, underwent different treatments and then given post-tests. The design would be better conceptualized with the use of the following illustration:



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where:

O_1 and O_3 were the pre-tests of both groups

O_2 and O_4 were the post-tests of both groups

and X was the treatment.

The experimental group was given remedial instruction using programmed materials, computer-based lessons and audio-visual presentation. The control group underwent the usual traditional method of remedial instruction using lecture-discussion.

Both groups (control and experimental) were given a pre-test on mathematics achievement. At the end of the program, both groups were given post-test on mathematics achievement. Their performances in the pre- and post-tests were compared and analyzed.

TREATMENT OF DATA

A. The following procedures were used to analyze the weaknesses and strengths of the remedial in math in Benedictine Abbey School and Elizabeth Seton School:

1. The pre-test was administered to the subjects of the two groups and also to the 70 randomly selected first year students of both schools who passed Mathematics I for the second quarter. The mean scores for each area for each group were compared. The mean scores of the remedial class students which were lower than the mean scores of those who passed were considered as weaknesses and those which were equal or higher were considered as strengths.

B. To determine the effects of the traditional and the proposed remedial program on the mathematics achievement of the subjects, both groups were given the pre-test and the post-test on mathematics achievement.

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1. The pre-test and post-test scores of the control group were compared using the t-test for dependent samples. This was also done to the experimental group to determine the presence of a significant change in their achievement in mathematics before and after the experiment.
2. The post-test math achievement scores of the two groups were also compared using the one-way analysis of Covariance (ANCOVA), with the students' pre-test and IQ scores as the two covariates.

FINDINGS:

1. ON NEEDS ASSESSMENT:

- 1.1 Based on the results of the pre-test given to the population, the control group and the experimental group, it was found out that the area of strength of the students in the remedial program (the slow learners) was on the area of numerical expressions. The means obtained by each group (control and experimental) were not significantly different from the obtained means of the population.

The areas of weaknesses of the students in the remedial program were on signed numbers and polynomials. The obtained means of each group were significantly different from the obtained means of the population group.

However, the areas on fractions and algebraic expressions were found to be areas of weaknesses of the experimental group only. The researcher felt that because of this, these areas should also be given emphasis in the remedial program.

2. ON PROGRAM DEVELOPMENT:

- 2.1 To answer the question on what developmental lessons and activities to give in the remedial program, the researcher pointed out that the lessons should be based on the weaknesses of the



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slow learners. In this study the lessons were mostly on topics in algebra which was quite abstract in nature like algebraic expressions, polynomials and exponential expressions. Skills on the comprehension level were given attention in order to conceptualize the concepts they were taught. The activities included those which caught students' attention, appealed to the slow learners' senses and adoptable to their deficiencies. Short drills and exercises were given to the two groups. Activities that included the use of audio-visual materials, programmed materials and computers, which were very much effective on this area, were given to the experimental group.

3. ON PROGRAM EVALUATION:

3.1 To find out the effects of the proposed and the traditional remedial programs on the academic achievement in Elementary Algebra of the slow learners, results of the pre-test and post-test of both the control and experimental groups were compared.

3.1.1 The mean scores of the experimental group in the pre-test and post-test were 14.5769 and 17.1154, respectively. The t-test conducted on the pre-test and post-test scores of the experimental group yielded a t-value of 3.892332204. Compared with the critical value of t at .05 level which was 2.060, this difference was significant.

The hypothesis which stated that there was no significant difference in the mathematics achievement of the experimental group before and after receiving the proposed remedial program was, rejected.

3.2.1 The mean score of the control group in the pre-test which was 15.8077 was the same as the obtained mean score in the post-test. The t-value obtained was 0 which was clearly not significant.



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The hypothesis that there was no significant difference in the mathematics achievement of the control group before and after receiving the traditional remedial instruction was accepted.

3.1.3 The probability that certain factors like IQ and pre-test had significant correlations on the achievement of the students was analyzed with the use of the analysis of covariance (ANCOVA) with pre-test and IQ as covariates.

The results of the analysis showed that the IQ and the pre-test partialled out, the differences in the adjusted means and the actual means were significant at the .05 level of significance. The adjusted means were 14.73887 and 18.18421. The mean of the experimental group had larger difference from the predicted mean. Based on the effective eta squared, about 31.79% of the variance in the students' post-test scores may be attributed to the effects of the covariates, particularly the pre-test, while approximately 11.47% of said variance was explained by the effect of the treatment (i.e. traditional remedial program and the proposed remedial program). This was over and above that explained by the covariates.

The hypothesis that there is no significant difference between the mathematics achievement of the experimental group who received the proposed remedial program and that of the control group who received the traditional remedial instruction was rejected.



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3.2 Evaluation of the program, given by the students under the experimental group, indicated that the students showed enthusiasm in the method of instruction administered to them. The students also gave their favorable preference using the computer in learning math.

CONCLUSIONS:

Based on the above findings, the researcher concludes that the proposed remedial program using the following methods of instruction: Computer based instruction, Audio-visual instruction and programmed instruction was generally effective in attaining better academic achievement on the part of the slow learners in Mathematics I.

RECOMMENDATIONS:

The researcher makes the following recommendations based on her findings and conclusions:

1. Benedictine Abbey School may adopt the proposed remedial program in math on a ty-out basis and evaluate its effectiveness after one year of implementation.
2. Since the students of the remedial programs, particularly those of the control group, generally did not have significant gains in learning after remediation, there is a need for the respective schools to give in-service trainings on effective approaches for use in math remedial programs.



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3. Future researches may be conducted

3.1 To validate the findings of the study using a larger sample;

3.2 To determine and analyze students' weaknesses and strengths, especially those of the slow learners which can serve as a basis in developing mathematics remedial programs for the students.



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