LABORATORY EXPERIMENTS FOR SENIOR HIGH GENERAL MATHEMATICS

by

GLENDA GAYLE TRAVIS

B.S., Fort Hays Kansas State College, 1965

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1969

Approved by:

Major Professor

This report is affectionately dedicated to

my parents

Mr. and Mrs. Glenn W. Cleveland

TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION	1
	The Problem	1
	Statement of the problem	1
	Importance of the study	2
	Definitions of Terms Used	2
	Computing, Managing, and Spending your Income	2
	General Mathematics	3
	Guide sheets	3
	Informal Geometry	3
	Laboratory experiments	3
	Laboratory	3
	Senior high school	3
	Statistics and Probability	3
	Terminal student	4
	Procedures Employed in the Study	4
II.	REVIEW OF THE LITERATURE	6
	Studies Concerning the Laboratory Method of Teaching Mathematics	6
	How the Laboratory Method Makes Use of Principles of Learning	6
	Educators Who Recommend Using the Laboratory Method of Teaching Mathematics	9
	Organizing a Mathematics Laboratory	13

CHAPTER PAGE

Level at Which the Terminal Student Should Enroll in General Mathematics 15

III. SUGGESTED LABORATORY EXERCISES FOR PROPOSED UNITS 17

Exercises for Informal Geometry 18

Exercises for Statistics and Probability 29

Exercises for Computing, Managing, and Spending Your Income 36

ACKNOWLEDGMENTS 42

BIBLIOGRAPHY 43

APPENDIX A 47

APPENDIX B 49

APPENDIX C 51

CHAPTER I

INTRODUCTION

The terminal student usually finds mathematics difficult and uninteresting. Generally, he only takes a course in mathematics to gain a credit for graduation.

The terminal student's dislike of mathematics many times is a result of inadequate teaching methods. Professional journals and mathematics method books indicate that the traditional lecture-demonstration-drill approach does not meet the needs of this type of student. Specialists in the field of mathematics methodology, such as Donovan A. Johnson and Charles Butler, are suggesting that teachers use the laboratory method. Title III of the National Defense Education Act of 1958 is promoting this method by enabling mathematics departments to remodel facilities and to purchase equipment and materials. In addition to facilities, equipment, and materials, the teacher needs to have guide sheets for the students to use in the laboratory. This study deals with the development of guide sheets for the teacher to use.

I. THE PROBLEM

Statement of the problem. This study was designed to develop three sets of laboratory experiments for teachers which would enable them to make use of the laboratory method in the classroom with a minimum of expensive equipment. They are presented in the form of guide sheets. The experiments were designed for an eleventh or twelfth grade general mathematics course.

Specifically, the three sets of experiments will deal with these three units of study:

1. Informal Geometry
2. Statistics and Probability
3. Computing, Managing, and Spending Your Income.

It is hoped that the writer and other teachers will use these experiments, and design studies to answer the following questions:

Do terminal students achieve more under the laboratory method than under the lecture-demonstration-drill method in a general mathematics course?

Does the terminal student's attitude improve under the laboratory method in a general mathematics course?

Importance of the study. There is a dearth of well-organized experiments for teachers; however, many teachers lack the ideas, the time, or the material to develop them. Thus, the development of specific laboratory experiments to be used in specific units of study should prove useful to teachers of general mathematics classes.

II. DEFINITIONS OF TERMS USED

Certain educational terms are defined so the reader will have a common understanding of the way in which they are used in this paper.

Computing, Managing, and Spending Your Income. A unit of study in general mathematics dealing with the following topics: budgets, buying wisely, household expenses, kitchen problems, parcel post, services of a bank, installment buying, credit, discounts, insurance, investments, Social Security, and taxes.