8-1-1973

A Comparison of the Performance of High School Bookkeeping/ Accounting Students Taught in A Structured Classroom and Those Taught by an Individualized Study Method

Alvin L. Kelling

A COMPARISON OF THE PERFORMANCE OF HIGH SCHOOL BOOKKEEPING/ACCOUNTING STUDENTS TAUGHT IN A STRUCTURED CLASSROOM AND THOSE TAUGHT BY AN INDIVIDUALIZED STUDY METHOD

by
Alvin L. Kelling

Bachelor of Science, Dickinson State College 1968

An Independent Study
Submitted to the Faculty
of the
University of North Dakota
in partial fulfillment of the requirements
for the degree of
Master of Science

Grand Forks, North Dakota

August
1973

This Independent Study submitted by Alvin L. Kelling in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

John Peterson
(Advisor)

John E. Rumel
(Chairman)

ACKNOWLEDGMENTS

Sincere appreciation is extended to Dr. John Peterson for his help and guidance which made the completion of this study possible.

The writer is also grateful to the administrators of Aberdeen School District #5, Aberdeen, Washington, for allowing this study to be conducted.

TABLE OF CONTENTS

ACKNOWLEDGMENTS iii

LIST OF TABLES v

Chapter

I. INTRODUCTION 1

Statement of the Problem
Purpose of the Study
Need for the Study
Delimitations of the Study
Definition of Terms

II. REVIEW OF RELATED LITERATURE 4

Why Individualize Instruction in High School Bookkeeping and Accounting
Methods of Individualizing Instruction
Pros and Cons of Individualized Study

III. PROCEDURES 15

IV. FINDINGS 17

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 27

Summary
Conclusions
Recommendations

BIBLIOGRAPHY 30

LIST OF TABLES

Table | Page

1. Previous Mathematics Grade Averages and Percentile Rank on The Iowa Test of Educational Development for Period 1 Class 18

2. Previous Mathematics Grade Averages and Percentile Rank on The Iowa Test of Educational Development for Period 4 Class 19

3. Previous Mathematics Grade Averages and Percentile Rank on The Iowa Test of Educational Development for Period 6 Class 20

4. Comparison of Student Achievement on Criterion Tests for Control and Experimental Classes 21

5. Criterion Test Results of Students Scoring Above the Eightieth Percentile in Mathematics on The Iowa Test of Educational Development 23

6. Criterion Test Results of Students Scoring Between the Fiftieth and Eightieth Percentile in Mathematics on The Iowa Test of Educational Development 24

7. Criterion Test Results of Students Scoring Below the Fiftieth Percentile in Mathematics on The Iowa Test of Educational Development 25

8. Range Comparison of Criterion Test Scores for Control and Experimental Classes 26

CHAPTER I

INTRODUCTION

In most classrooms there are wide ranges in student abilities, as stated in Individually Prescribed Instruction (1966).

> In recent years, as awareness of individual differences among students has increased, much effort has been devoted to developing instructional schemes which allow individualized instruction. The emergence of ability grouping, nongraded classrooms, continuous progress plans, and programmed instruction provide ample evidence of a continuing search for ways to adapt instruction to the individual.

In spite of this evidence most high school bookkeeping/accounting teachers force students in the class to move through the subject matter at the same rate--as if all students in the class possess the same level of ability.

Statement of the Problem

The problem of this study was to determine which method of teaching high school bookkeeping and accounting best meets the needs of students at Weatherwax High School, Aberdeen, Washington, and to ascertain what changes, if any, should be made in existing methods of instruction.

Purpose of the Study

The purpose of this study was to compare the effectiveness of teaching high school bookkeeping/accounting by the structured method, with the effectiveness of teaching high school bookkeeping/

accounting by the individualized study method. To achieve this purpose two classes were selected from a group of three. The control group was taught as a structured class and the experimental group was taught by the individualized study method.

Need for the Study

In any bookkeeping and accounting classroom there are wide ranges in student abilities. Regardless of attempts made to develop homogeneous classes by means of ability grouping, there will continue to be a wide range of ability levels in the same classroom. If students are to have the opportunity to learn at a rate commensurate with their ability, it is obvious that this requires an instructional approach different from the prevailing one in which everyone is expected to learn at the same rate (Harms and Stehr, 1963).

The structure of the subject matter in beginning bookkeeping is such that each unit of work cumulatively builds on preceding units. Consequently, understanding of each new unit of subject matter is, to a large extent, dependent on mastery of the preceding units (Gibbs, 1970).

Harms and Stehr go on to say that yet, in spite of this knowledge, the organization of most bookkeeping and accounting instruction today provides all students in the class with the same amount of instructional time on each unit of work.

When all students are required to reach mastery before they can proceed, the instruction must be individualized--there is no other way of getting widely differing students to attain a common standard (Washburne, 1925).

Gibbs (1970) concludes by saying:

> The fact that many students in a bookkeeping class may not fully understand some essential concepts in the text does not seem to deter many bookkeeping teachers from proceeding to the next chapter in order to cover a prescribed amount of material. The result is that many bookkeeping students, who could succeed if given more instructional time, get caught up in a progression of cumulative confusion. The portion of these students who do not drop out but go on to cover the prescribed number of chapters, complete the course without any real understanding of bookkeeping. The remedy to this situation lies partly in substituting piecework for timework in bookkeeping instruction.

Delimitations

The following were considered delimitations of the study:

1. This study was delimited to the business education department at Weatherwax High School, Aberdeen, Washington, during the first semester of the 1972-1973 school year.

2. This study was delimited to students who used as their basic textbook the 23rd Edition of 20th Century Bookkeeping and Accounting and who were evaluated by published objective and problem tests.

Definition of Terms

For purposes of clarification the following terms are defined as they apply to this study.

Individualized Study Method.--A study method geared to the individual differences of students which allows them to achieve the course objectives at a rate commensurate with their ability to master the subject matter.

Structured Class.--A class organization that provides all students in the class with the same amount of instructional time on each unit of work regardless of individual ability to master subject matter.

CHAPTER II

RELATED LITERATURE

Material written concerning individualized instruction in education and in teaching high school bookkeeping and accounting was read and evaluated. The following constitutes a summary of literature related to the topic.

Reasons for Individualizing Instruction in High School Bookkeeping and Accounting

An awareness of individual differences among students has increased during recent years. Much effort has been devoted to developing instructional methods which allow individualized instruction. The emergence of ability grouping, nongraded classrooms, continuous progress plans, and programmed instruction provide ample evidence of a continuing search for ways to adapt instruction to the individual.

The organization of traditional educational programs in American school systems has been geared toward groups of students in self-contained classrooms. Many children have left home as individuals only to enter a school bus or a school door where they are treated as a group and indoctrinated as only one of a group and thus subjected to all aspects of group life. Group norms and general group activities become a way of life to the student.

In an article dealing with "Individualizing Educational Programs," Bishop (1971), professor at New York University, New York, states:

> In recent years, instructional methods and organizational patterns within schools have reflected a strong desire to develop more effective techniques for coping with the individual differences and needs of both professional staff and student. There is an urgent and justifiable demand for schools to become more humanizing social institutions capable of developing creative and imaginative processes for recognizing the individual within conventional organizational situations. This seems particularly germane when we consider our culture which is experiencing such extreme technological advances, tendencies for dehumanization of the individual and prophetic overtones of the "Big brother" society.

Bishop (1971) continues by asking the reader to consider the following propositions:

1. That learning takes place individually; therefore, curriculum and methodology should be organized around the individual child. The quest for ways to individualize learning is the most important innovating force influencing the development of present-day educational systems.
2. That students must come in contact with different levels of learning and have the opportunity to work together to discover the relationships of various disciplines as aspects of one world. Fragmentation and compartmentalization of subject matter must be replaced with interdisciplinary and multidisciplinary approaches with the concomitant interaction of the instructional staff.
3. That there are no time limits or space limits on when or where a student can learn-with or without the teacher and the formal classroom. In fact, there are no age limits; for education to be internalized, students must learn that true education is a continuing process. This is the ubiquitous nature of true education and learning.
4. That the educational program must be dynamic and in a constant state of evaluation and change in order to survive. It must be adaptable, flexible, and capable of meeting the demands of a complex technological and changing culture.

These premises seem to provide dynamic ideas by which to change the educational procedures and to provide the best possible educational methods for students.

Hosler (1971), professor at the University of Wisconsin, Madison, states in his article on individualized instruction that "The development of programs on the individualization of instruction will be a major thrust in the seventies." Hosler (1971) continues by saying:

> The large number of schools today which are either operating on the modular schedule or are exploring that possibility give evidence of this development. Further, in attending any educational exhibit today, one must be impressed with the tremendous quantities of hardware and software which have been developed for individualized instruction.

Daughtrey (1965) states that "Difference in learning ability is not in kind but in degree." She implies that all students in a class may have the ability to master a certain body of subject matter, but that the amount of time and appropriate practice for the individual student to achieve mastery will vary according to the ability level of each student.

West (1971) in his article writes:

> Differences in intelligence affect learning rate and, thereby, the levels of student achievement at any given time during learning. So do other things, such as differences in prerequisite knowledges, understandings, and skills from earlier educational experiences, differences in attitudes toward school, toward the subject, toward the teacher. Too often, it is the teacher who is active, "talking at" passive students, numbers of whom may not be listening attentively. Instead, it is the student who should be a fountain of questions, and students a fountain of answers. Or the instructional materials should require many overt responses by the learner.

These few examples demonstrate the need for individualized instruction in bookkeeping and accounting for high school students.

Methods of Individualizing Instruction

"In recent years, education has witnessed the emergence of new types of curriculum materials which embody the conditions for independent learning" (Gibbs, 1970). These materials are known as programmed materials. They control the way in which learning proceeds and they are potentially self-contained or autonomous.

Gibbs (1970) contends that the cost of developing orthodox programmed materials has made their adoption for classroom use prohibitive, but a practical solution to the cost problem was pioneered in the 1920's by Sidney L. Pressey and was known as adjunctive instructional programming. Klaus (1961) in his article on analysis of programming states:

> The adjunctive approach to the instructional programming advocated by Pressey is based on the idea that active responding and corrective feedback can be incorporated into an instructional sequence without converting regular text material into a programmed text format.

On the subject of adjunct programmed materials, Deterline (1967) makes the following statement:

> The teacher can use the prescribed or available textbook by preparing an "Adjunctive" program that simply tells the student what to look at, read, inspect, and so on. The adjunct program can present each response requirement and the corresponding evaluation feedback. An adjunctive program, is in effect, the component that provides the "interaction," while using the conventional textbook or reference book as the information component.

Gibbs (1970) continues by saying:

> In addition to well developed text material and application problems there are two conditions necessary for independent learning.
>
> a. First students must have an opportunity to test their understanding of the subject matter as he proceeds through the instructional sequence.
>
> b. Each student must receive corrective feedback immediately following his response to a test-like event. This allows for remedial action at any point.

Adjunctive programs also have the following advantages (Gibbs, 1970):

1. They maintain the coherent structure of subject matter.
2. They complement established educational materials instead of replacing them.
3. They overcome the cost problem which has prevented programmed material from entering the mainstream of educational practice.

Gibbs (1970) concludes by saying:

> Because of these advantages, adjunctive programs should be considered as a practical solution to the problem of incorporating the conditions for independent learning into the bookkeeping classroom, thus facilitating the implementation of an individualized approach to instruction. Such an individualized approach can help liberate the student from the lockstep of the homogenous group approach.

Once the teacher of high school bookkeeping and accounting has made the choice to be innovative, the possibilities of performance criteria organization for his class are endless. In some respects, the student-teacher relationship parallels the patient-doctor relationship. A doctor would not attempt to treat a group of patients at one time because he realizes that each patient has a peculiar problem. The same is true of the student (Dover, 1970). Each has his own difficulties and each should be dealt with individually.

Dover (1970) says that he employs the following methods in his high school of 400 students in Sheldon, Iowa:

1. Students are scheduled in the course for two 40-minute sessions and two 60-minute sessions per week. The class size is approximately 30 for these sessions. One large group, composed of all the students in the school enrolled in bookkeeping-accounting, is held each week for 20 minutes.
2. The bookkeeping-accounting class is taught traditionally until the basic principles of debit and credit and the recording of typical business transactions have been established. That is, students are kept at the same

place during the beginning phases of the cycle; accordingly, the instructor can become aware of special problems and begin to make decisions as to which students may or may not be able to function on an individual learning basis.

3. With the independent study plan, students can be required to report to the classroom for the entire scheduled time or only a part of it. A mistake is made if the bookkeeping-accounting teacher assumes that all students can function on an individual learning basis, progressing at their own rates. The informed teacher will soon recognize that intelligence is not the only criterion to be used when determining those students who should progress individually. Self-discipline and the desire to learn are even more important.
4. At this point, the students are given a packet of materials to provide them with an overview of how the performance criteria program will be conducted. Included in this packet are the following:
   a. Overall behavioral objectives of the course. These objectives are general in nature and not the type which can be effectively evaluated.
   b. Required materials such as texts, workbooks, notebooks, and the like.
   c. Guideposts which give dates by which certain material must be completed. This keeps the students moving and helps them budget their time.
   d. Evaluative criteria. Students are informed very clearly on what basis they will be evaluated.
   e. Test schedules and any other information for which the student may be held responsible.
5. A learning guide and an evaluation are prepared for each unit of work. Included in the learning guide are:
   a. Specific behavioral objectives. These objectives must be so written that they call for specific action. A good beginning for such objectives is, "The student will be able to" followed by a series of requirements that are very clear and can be evaluated.
   b. Required work. Such work will be differentiated into parts that may be called "learning activities" or any other term that implies that there is a purpose for the completion of the work.
   c. Self-test. The self-test should test the same material to be evaluated on the posttest, although in a different form of questioning. The answers to the self-test should also be included.

6. After the bookkeeping-accounting student has successfully completed the assigned work and met the required standard, he is free to pick up the next learning guide and begin work on it.
7. Class presentations are made on each topic. The time of such presentations is announced, and the students participating in the independent study program are required to attend only if the bookkeeping-accounting teacher directs them to do so.

Dover (1971) concludes by calling attention to the fact that "One would be foolish indeed to say that the method of teaching bookkeeping-accounting described in this article is without fault. Certainly all teaching problems will not be solved by it!"

Hempel (1970) of Centennial Union High School, Gresham, Oregon, describes still another method of individualizing instruction in bookkeeping-accounting classes.

> With the revolutionary developments now taking place in educational technology, I am convinced that the wise use of tapes, compact cassettes, and other software is beginning to enter a new era. I am currently recording my bookkeeping lectures on tape after school.

Hempel (1970) points out that these cassette tapes can be used for makeup work, remedial work, seminar work, and supportive material for substitute teachers.

In conclusion to his article Hempel (1970) states:

> It is true that many publishing companies have responded to these new approaches to learning through educational technology, however, most of these companies have resorted to a piecemeal approach to programming. It is my personal feeling that many of these programs are much too fragmented, and the coverage of a specific topic is often so short or narrow that it is impractical to use in the field of business education.

Bishop (1971) of New York University, New York, in his article categorizes several individualized programs.

> Because individualization of instruction is such a broad, comprehensive concept, it would be well to briefly

review and categorize several representative examples of programs which attempt to allow for greater individualization. These innovative programs will be classified into four broad areas:

1. New organizational patterns within schools.
2. Specific curriculum materials development.
3. Educational technology.
4. New designs in educational facilities.

Pros and Cons of Individualized Study

Since most individualized instruction methods are organized in behavioral terms, it is probably appropriate to apply the same support and criticisms to the individualized study method as some authors have directed toward behavioral objectives.

Kibler (1971) in his book states the following to be the three most commonly asked questions concerning behavioral objectives:

1. Can all important outcomes of education be defined and measured behaviorally?
2. Can prespecification of objectives prevent teachers from achieving objectives which might arise unexpectedly during a course of instruction?
3. Will more trivial learner behaviors, which are the easiest to operationalize, receive a greater emphasis than more important educational outcomes?

Kibler (1971) in answer to #1 declares:

> The schools cannot be all things to all segments of society. It seems that the primary responsibility of the schools should be to educate effectively the youth of the society. And to the extent that this is so, all modifications of parental attitudes, professional staff attitudes, etc., should be weighed in terms of a later measurable impact on the learner himself.

Kibler (1971) in answer to #2 above writes:

> When one specifies explicit ends for an instructional program there is no necessary implication that the means to achieve those ends are also specified. Serendipity in the classroom is always welcome but, and here is the important point, it should always be justified in terms of its contribution to the learner's attainment of worthwhile objectives.

Kibler (1971) quotes Popham's paper "Probing the Validity of Arguments Against Behavioral Goals" in answer to #3:

> The very fact that we can make these behaviors explicit permits the teacher and his colleagues to scrutinize them carefully and thus eliminate them as unworthy of our educational efforts. Instead of encouraging unimportant outcomes in education, the use of explicit instructional objectives makes it possible to identify and reject those objectives which are unimportant.

Kibler (1971) continues to probe the validity of behavioral objectives by writing:

4. Measurability implies behavior which can be objectively mechanistically measured, hence there must be something dehumanizing about the approach.
5. It is somehow undemocratic to plan in advance precisely how the learner should behave after instruction.
6. That isn't really the way teaching is; teachers rarely specify their goals in terms of measurable learner behaviors; so let's set realistic expectations of teachers.
7. While loose general statements of objectives may appear worthwhile to an outsider, if most educational goals were stated precisely, they would be revealed as generally innocuous.
8. Measurability implies accountability; teachers might be judged on their ability to produce results in learners rather than on the many bases now used as indices of competence.
9. It is far more difficult to generate such precise objectives than to talk about objectives in our customarily vague terms.
10. In evaluating the worth of instructional schemes it is often the unanticipated results which are really important, but prespecified goals may make the evaluator inattentive to the unforeseen.

According to Miles, Kibler and Pettigrew (1967), some research demonstrates that students when given a list of specific behavioral objectives for a course, tend to perform better on objective tests than when they are not aware of specific course objectives.

Kibler (1971) states another value to students:

> The value of giving behavioral objectives to students is intangible yet very important. It is the sense of security

a student experiences when he knows what specifically is expected from him in a course and the conditions under which he will be expected to exhibit his competencies.

Kibler, Barker, Miles (1971) go on to state the following as being advantages to teachers that use behavioral objectives.

1. Objectives prompt teachers to determine the most significant aspect of subject matter to be learned.
2. Behavioral objectives aid in establishing criteria for the measurement of classroom achievement.
3. A side effect of these two values for teachers is similar to that experienced by students. The teacher who is confident that the subject matter being presented is of prime importance and that measurement of achievement is efficient and appropriate to course goals, is more secure in his position and, consequently, is usually more satisfied with his professional contribution.

Kibler, Barker, Miles (1971) state the following as being values of behavioral objectives for administrators:

> The administrator responsible for designing and coordinating curricula (in conjunction with the instructional staff) relies on behavioral objectives to insure that content and subject matter are covered adequately and that there are minimal overlaps between courses, especially within related areas. The use of behavioral objectives also promotes consistency and a thread of continuity among related courses.
>
> When the administrator is supervisor and teacher-evaluator behavioral objectives help him in a different way. The objectives suggest the degree of progress desired at a point in the course in light of the predetermined sequence of units and help determine if teachers are pursuing adequately the goals of the course. When the behavioral objectives are developed by the teacher, they give the supervising administrator insight into the teacher's philosophy and course goals. This freedom to develop individual objectives is more prevalent at higher levels of instruction.

Kibler, Barker, Miles (1971) state the following as being values of behavioral objectives for school boards:

> When a school system requires behavioral objectives for courses, it is possible to demonstrate the content of courses in objective form to a school board and thus demonstrate more concretely than might otherwise be possible, precisely what learning achievements occur in a given classroom on a given day. This concrete representation of the educational program

> often may have some communicative or persuasive value to a school board. Thus, behavioral objectives may help educate and persuade those persons in charge of educational funds.

The presence of behavioral objectives can serve to make parents more familiar with the child's desired growth and, in some instances, indicate areas where the child needs special help outside of the classroom (Kibler, Barker, Miles, 1971).

Wiley (1971) of Southern Illinois University, Edwardsville, who has written extensively on the subject of individualized instruction including the co-authoring of the book, The Flexibly Scheduled High School states:

> It is just as nonsensical to assume that all students will benefit from and can effectively utilize the freedom of independent and individualized study in a flexible schedule as it is to generalize that all students learn at the same rate of speed in terms of time.

CHAPTER III

PROCEDURES

The purpose of this study was to compare the effectiveness of teaching high school bookkeeping and accounting by the structured method with the effectiveness of teaching high school bookkeeping and accounting by the individualized study method.

Because of the great amount of emphasis placed upon individualizing instruction, the number of articles written on individualizing instruction, the amount of technology available, and the popularity of individualized instruction today, the writer believed such a study had merit. The writer felt that a study involving a comparison of the effectiveness of teaching bookkeeping and accounting by the structured method with the effectiveness of teaching high school bookkeeping and accounting by the individualized method was needed at his school. Permission was received from the writer's major advisor to proceed with a study of this nature.

Literature was obtained from various local libraries and other sources on individualized instruction and other related areas. These sources were read to obtain background information for the study.

Permission was received from the writer's principal to proceed with this study at the writer's high school.

The two bookkeeping and accounting classes most evenly matched in ability, based upon Iowa Test of Educational Development scores and previous mathematics grades, were selected from a group of three classes.

Both groups met in the same classroom, used South-Western Publishing Company's 20th Century Bookkeeping and Accounting, completed the same problems, and were evaluated by the same published objective and problem tests. Both groups were taught by the traditional method until they had completed the first five chapters of the textbook.

Upon completion of these chapters, the experimental group was provided with a list of problems to be worked for each chapter. The control group was assigned the same problems only on a day-by-day basis. Progression check points were provided orally for the experimental group.

Material from each chapter was previewed on a lecture basis for the control group. Coverage of the chapter content by the instructor for the experimental group was done on an individual or small group basis only and when considered necessary by the students or by the instructor.

The study was conducted during the first semester of the 1972-1973 school year at Weatherwax High School, Aberdeen, Washington.

The results of this study were tabulated, analyzed, and presented in the following chapters.

CHAPTER IV

FINDINGS

Upon evaluation of previous mathematics grades and the mathematics and composite scores of the Iowa Test of Educational Development, Period I and Period IV classes were selected as the most evenly matched in ability.

Tables 1, 2 and 3, pages 18, 19 and 20, indicate the individual grade point average and mean score of all mathematics grades received in mathematics classes that the students had completed prior to enrolling in bookkeeping/accounting. Tables 1, 2 and 3 also indicate by period the individual and mean percentile rank of students on the composite and mathematics scores on the Iowa Test of Educational Development.

The writer selected students in the Period 1 class to be the experimental group and students in the Period 4 class to be the control group, as they were separated by less than one percentile on the Iowa Test of Educational Development. Tables 1 and 2 also show that the students in Period 1 and 4 had received almost identical grades in previous mathematics classes.

Table 4, page 21, compares the mean scores of both the control and the experimental groups on the criterion test. The scores are expressed in per cent and are based on the results of identical objective and problem publisher's tests. The mean of the control group was 1.30 per cent higher than the mean of the experimental group.

TABLE 1

PREVIOUS MATHEMATICS GRADE AVERAGES AND PERCENTILE RANK ON THE IOWA TEST OF EDUCATIONAL DEVELOPMENT FOR PERIOD 1 CLASS

Student Number	Average Math Grade Point	Iowa Test (Percentile)	
		Mathematics	Composite
1	1.5	17	15
2	2.5	21	24
3	2.0	76	66
4	3.5	61	71
5	2.5	73	84
6	3.5	76	87
7	3.5	86	89
8	2.0	57	72
9	3.5	90	66
10	2.0	57	49
11	2.0	49	66
12	2.5	76	49
13	2.1	51	68
14	2.5	86	75
15	3.0	70	66
16	2.5	81	41
17	3.5	81	82
18	3.5	93	90
19	2.0	64	55
20	2.0	57	48
21	2.5	73	73
22	3.8	97	96
23	3.2	96	89
Mean	2.67	69.13	66.17

TABLE 2

PREVIOUS MATHEMATICS GRADE AVERAGES AND PERCENTILE RANK ON THE IOWA TEST OF EDUCATIONAL DEVELOPMENT FOR PERIOD 4 CLASS

Student Number	Average Math Grade Point	Iowa Test (Percentile)	
		Mathematics	Composite
1	3.5	76	87
2	1.5	21	9
3	3.0	46	66
4	3.5	86	91
5	3.0	81	66
6	2.5	76	76
7	1.5	21	28
8	3.5	73	79
9	2.0	54	61
10	3.0	85	80
11	3.5	76	71
12	2.0	64	60
13	3.5	90	82
14	3.8	86	89
15	1.5	51	54
16	2.5	84	86
17	3.5	89	80
18	1.5	56	40
19	1.2	31	40
20	3.8	90	87
Mean	2.69	66.80	66.60

TABLE 3

PREVIOUS MATHEMATICS GRADE AVERAGES AND PERCENTILE RANK ON THE IOWA TEST OF EDUCATIONAL DEVELOPMENT FOR PERIOD 6 CLASS

Student Number	Average Math Grade Point	Iowa Test (Percentile)	
		Mathematics	Composite
1	2.0	36	41
2	2.0	60	81
3	2.0	11	15
4	2.0	02	11
5	3.0	90	87
6	3.0	46	66
7	2.8	73	70
8	2.0	76	80
9	1.5	21	11
10	3.0	93	85
11	2.2	86	75
12	1.8	21	24
13	2.0	31	29
14	3.5	76	84
15	2.0	50	35
16	2.0	28	55
17	2.0	35	17
18	2.0	70	65
19	2.2	35	51
20	3.5	88	84
21	4.0	86	87
22	1.2	36	41
Mean	2.25	51.83	52.0

TABLE 4

COMPARISON OF STUDENT ACHIEVEMENT ON CRITERION TESTS FOR CONTROL AND EXPERIMENTAL CLASSES

Student Number	Period 1 Experimental Group	Period 4 Control Group
1	77	97
2	89	84
3	87	92
4	96	95
5	86	95
6	97	91
7	93	68
8	88	95
9	95	94
10	72	93
11	84	87
12	65	86
13	89	94
14	89	85
15	80	77
16	84	92
17	91	93
18	92	84
19	82	75
20	88	95
21	90	
22	97	
23	97	
Mean	87.30	88.60

Mean accounting scores of students who scored above the eightieth percentile on The Iowa Test of Educational Development are compared in Table 5, on page 23. The control group scored 1.63 per cent higher than the experimental group.

Table 6, on page 24, shows the individual scores and the group mean of students scoring between the fiftieth and eightieth percentiles on the mathematics section of The Iowa Test for Educational Development. Within this ability grouping, the control group again had the higher mean score of 88.87 per cent compared to a mean of 85 per cent for the experimental group.

The ability grouping shown on Table 7, page 25, gives the individual and group mean of the control and experimental groups of students who scored below the fiftieth percentile on the mathematics section of the Iowa Test. This ability grouping was the only group in which the experimental group scored higher than the control group. The mean percentage for the experimental group was 83.33 per cent compared to 79.75 per cent for the control group; a difference of 3.58 per cent.

Table 8, on page 26, shows a comparison of the range of test scores for the control and experimental groups. The largest number of students scored had scores above 84 per cent in both groups. Four more students in the control group scored higher than 90 per cent than did those in the experimental group.

The experimental group had the largest number of students scoring over 96 per cent on the criterion tests. However, the experimental group also had the largest number of students scoring below 84 per cent.

TABLE 5

CRITERION TEST RESULTS OF STUDENTS SCORING ABOVE THE EIGHTIETH PERCENTILE IN MATHEMATICS ON THE IOWA TEST OF EDUCATIONAL DEVELOPMENT

Period 1 (Experimental)

Student Number	Iowa Test Math Score (Percentile)	Accounting Score in Per Cent
7	86	93
9	90	95
14	86	89
16	81	84
17	81	82
18	93	92
22	97	97
23	96	97
Mean	88.75	91.12

Period 4 (Control)

Student Number	Iowa Test Math Score (Percentile)	Accounting Score in Per Cent
4	86	95
5	81	95
10	85	93
13	90	94
14	86	85
16	84	92
17	89	93
20	90	95
Mean	86.37	92.75

TABLE 6

CRITERION TEST RESULTS OF STUDENTS SCORING BETWEEN THE FIFTIETH AND EIGHTIETH PERCENTILE IN MATHEMATICS ON THE IOWA TEST OF EDUCATIONAL DEVELOPMENT

Period 1 (Experimental)

Student Number	Iowa Test Math Score (Percentile)	Accounting Score in Per Cent
3	76	87
4	61	96
5	73	86
6	76	97
8	57	88
10	57	72
12	76	65
13	51	89
15	70	80
19	64	82
20	57	88
21	73	90
Mean	65.91	85.00

Period 4 (Control)

Student Number	Iowa Test Math Score (Percentile)	Accounting Score in Per Cent
1	76	97
6	76	91
8	73	95
9	54	94
11	76	87
12	64	86
15	51	77
18	56	84
Mean	65.75	88.87

TABLE 7

CRITERION TEST RESULTS OF STUDENTS SCORING BELOW THE FIFTIETH PERCENTILE IN MATHEMATICS ON THE IOWA TEST OF EDUCATIONAL DEVELOPMENT

Period 1 (Experimental)

Student Number	Iowa Test Math Score (Percentile)	Accounting Score in Per Cent
1	17	77
2	21	89
11	49	84
Mean	29.00	83.33

Period 4 (Control)

Student Number	Iowa Test Math Score (Percentile)	Accounting Score in Per Cent
2	21	84
3	46	92
7	21	68
19	31	75
Mean	29.75	79.75

TABLE 8

RANGE COMPARISON OF CRITERION TEST SCORES
FOR CONTROL AND EXPERIMENTAL CLASSES

Interval	Frequency	
	Experimental Group	Control Group
98-96	4	1
95-93	2	8
92-90	3	3
89-87	6	1
86-84	3	4
83-81	1	. .
80-78	1	. .
77-75	1	2
74-72	1	. .
71-69	. .	. .
68-66	. .	1
65-63	1	. .

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to compare the effectiveness of the structured method and the individualized study method for teaching high school bookkeeping and accounting. To achieve the purpose two classes were selected from a group of three, and the results of criterion tests compared to determine the:

1. relative effectiveness of individualized instruction in high school bookkeeping and accounting.
2. relative effectiveness of individualized instruction in high school bookkeeping and accounting for upper ability students.
3. relative effectiveness of individualized instruction in high school bookkeeping and accounting for lower ability students.

Conclusions

Percentage scores for the criterion tests were averaged and reported in Chapter IV. The mean for each grouping was established and reported in Chapter IV. The following constitute the findings of this comparative study:

1. The criterion test mean of the class taught as a structured class was 1.30 per cent higher than the mean of the class taught by the individualized study method.
2. The criterion test mean of the upper ability students in the control group, taught in a structured class, was 92.75 per cent as compared to 91.12 per cent for the experimental group taught by the individualized method.
3. The criterion test mean of the lower ability students taught by the individualized study method was 83.33 per cent compared to 79.75 per cent for the students taught by the structured method.
4. The range of the control and experimental groups was approximately the same extending from 63 per cent to 93 per cent for the experimental group and from 66 per cent to 98 per cent for the control group.

Recommendations

As a result of the findings of this study, the following recommendations are made:

1. This study should be repeated for several years so that more definite conclusions regarding the feasibility of individualizing instruction in bookkeeping/accounting can be reached.
2. More emphasis should be placed upon improvement of teaching by individualized study methods, until experience in these methods is equal to those used in a structured class.

3. Upon continuation of this study for several years, a decision should be reached as to whether individualized study methods should be adopted or abandoned for high school bookkeeping and accounting classes at the author's school.

BIBLIOGRAPHY

Bishop, Lloyd K. "Individualizing Educational Programs." Business Education Forum, 25 No. 8 (May 1971) 13-14.

Daughtrey, A. S. Methods of Basic Business and Economic Education. Cincinnati: South Western Publishing Company, 1965, p. 144.

Deterline, William A. "Practical Problems in Program Production." The Sixty-Sixth Yearbook of the National Society for the Study of Education. The National Society for the Study of Education, 1967, p. 215.

Dover, Neal B. "Individualized Instruction Offers Challenge." Business Education Forum, 25 No. 5 (December 1970) 17-18.

Gibbs, William E. "Implementing Individualized Instruction in Bookkeeping." Balance Sheet, LI, No. 8 (April 1970) 350-353.

Harms, H. and Stehr. Methods in Vocational Business Education. Cincinnati: South-Western Publishing Company, 1963, p. 355.

Hempel, Marvin W. "Cassettes: A New Approach to Teaching Business Subjects." Balance Sheet, LI, No. 9 (May 1970) 392-394.

Hosler, Russell J. "Focus on Individualized Instruction." Business Education Forum, 25, No. 8 (May 1971) 11.

Individually Prescribed Instruction. Philadelphia: Research for Better Schools, 1966, pp. 8-10.

Kibler, Robert J.; Barker, Larry L. and Miles, David T. Behavioral Objectives and Instruction. Boston, Mass.: Allyn & Bacon, Inc., 1971.

Klaus, David J. "An Analysis of Programming Techniques." Programmed Learning and Teaching Machines II, Data and Directions. Washington: National Education Association, 1966, p. 145.

Lumsdaine, A. A.; Klaus, D. J. "What's in a Name? A Problem of Terminology." A V Communication Review, November-December 1961, pp. 208-211.

Miles, D. T.; Kibler, R. J.; and Pettigrew, L. E. "The Effects of Study Questions on College Students' Test Performance." Psychology in the Schools, 4 (1967) 25-26.

Washburne, Charleton W. "Burk's Individual System as Developed at Winnetke." Twenty-Fourth Yearbook of the National Society for the Study of Education. The National Society for the Study of Education, 1925, pp. 54-55.

West, Leonard J. "Individualization of Instruction." Business Education Forum, 25, No. 8 (May 1971) 19-21.

Wiley, W. Deane. "Flexible Scheduling--Some Considerations." Business Education Forum, 25, No. 8 (May 1971) 15-17.