

University of Manitoba

Business Teacher Perceptions  
of Effectiveness in the Teaching of The First Year  
High School Accounting Course in Manitoba

A Major Thesis

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BUSINESS TEACHER PERCEPTIONS  
OF EFFECTIVENESS IN THE TEACHING OF THE FIRST YEAR  
HIGH SCHOOL ACCOUNTING COURSE IN MANITOBA

BY

BLAISE FERNANDO

A thesis submitted to the Faculty of Graduate Studies of  
the University of Manitoba in partial fulfillment of the requirements  
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## ABSTRACT

### Statement of Problem

This study investigated the effectiveness of teaching the first year high school accounting as perceived by the business teachers in the Province of Manitoba. The problem of the study was to determine the business teacher perceptions of effectiveness pertaining to instructional methods, materials and principles of learning. The primary purpose of this study was to appraise the current teaching practices and procedures, with a view to achieve instructional efficiency, and to meet the present and projected needs of the students.

### Procedures or Methods

The subjects of this study included a random sample of 50 first year high school accounting teachers in the Province of Manitoba. A mailed questionnaire was used to gather data. A total of 40 usable questionnaires were returned by the teachers who participated in the survey. The results of the survey were analyzed by using both descriptive and inferential statistics. The hypotheses in the study were tested utilizing the analysis of variance and post-hoc multiple t tests.



## Findings and Conclusions

1. It is the opinion of most of the teachers surveyed that active participation by the learner in the learning situation is highly essential for instructional efficiency. The discovered concepts transfer to new situations better than the concepts learned through reception learning. There is also a strong belief among teachers that meaningfulness of material taught is highly essential for instructional efficiency. It is also suggested that a proper sequence in the presentation of learning material must be followed for effective learning to take place. It is believed that there should be greater awareness of the need for problem solving, communication skills, critical thinking and positive personal and social attitudes.

2. The accounting teachers surveyed indicate that the first year high school accounting students be given some insight into the role of automation and electronic data processing in business offices. As indicated in the survey results, 64.1 per cent of the sample is against the vocational objectives being emphasized in the first year high school accounting course.

3. The results of the study strongly indicate that accounting teachers should not be too content oriented. It is believed by most of the teachers that the individual student needs must be recognized and the accounting teachers should go slow with the lower ability students.

4. It is the opinion of most of the business teachers surveyed that the following learning principles - active participation, reinforcement, sequence, motivation and transfer when integrated with the appropriate teaching method will enhance instructional efficiency - this being a function of learning time. The survey responses clearly demonstrate that lecture-discussion, laboratory, problem solving, practice set and lecture are some of the most effective methods used in the first year high school accounting course.

5. The teachers surveyed indicated that the overhead projector is superior to the chalkboard as an instructional aid and the lecture-discussion method is superior to the laboratory method of instruction. The combined aid of the overhead projector and the chalkboard was believed to be very effective.

6. The survey responses revealed that the use of charts was quite effective but the effectiveness of films was viewed as minimal. Filmstrips were perceived to be relatively very effective, especially when reviewing the accounting cycle. The teachers strongly believed that the use of calculating machines be encouraged in the accounting classes.

7. The teacher responses indicate that the use of pencils in the accounting classes will help the students to be neat and to acquire a better mental picture

of the accounting procedures. Field trips can be a valuable experience if students are expected to give an individual or group report of the trip. Many teachers believe that the use of practice sets be encouraged.

#### Recommendations

It is recommended that the teaching method selected be consistent with the topic taught. An attempt should be made to integrate the teaching method with the principles of learning. The accounting procedures that are currently being used but not reflected in the accounting textbooks should be included in the course content. It is suggested that textbook writers should use the language appropriate to the grade level. A study should be made of those students who drop out or who fail the first year high school accounting course to determine possible weaknesses in teaching as well as identifiable student characteristics.

CHAPTER I  
INTRODUCTION

Today, the teacher's role is rapidly changing, with the learner as the focal point in the classroom. The teacher who understands the students' needs, self-image, and feelings about the course and future expectations can better satisfy their instructional needs and help the students to apply the course learnings to areas of special interests. Once goals are established the teacher makes use of a vast spectrum of resources to assist the learner. Students learn in different ways. Some learn best through discussions while others by listening. To provide a viable instructional strategy, it is essential that the teacher plans multiple learning experiences that are appropriate to each individual student in his class. Thus, "teaching" can be defined as the process of establishing conditions that facilitate the learning process.

The world of business is changing at a rate unprecedented in the annals of human history. It now seems clear that within the next quarter century most of the routine aspects of business accounting will be taken over by computer technology. This has made and will continue to make profound changes in business curricula and facili-

ties in the secondary schools.

"In a rapidly changing world anything we can do to develop flexibility of mind, receptivity to new ideas, habitual skills in learning for one's self, and other like mental characteristics, promises far more use to the individual and to society than would comparable attention to descriptive information about today's best business practices."<sup>1</sup>

This argument suggests that as we teach the current business practices in accounting, we must continually reach for those characteristics of broad general applicability - with emphasis on how to use effectively the acquired knowledge and skills in widely varying situations. Since we accept the certainty of change but recognize the uncertainty of its direction and outcome, there is greater need today than ever before to develop students' thought processes, their problem solving ability and their ability to keep on learning even after they leave the classroom.

During the past decade, accounting teachers have encountered many challenges in carrying out their professional duties - how to increase instructional efficiency and develop instructional materials to cope with the increase in class size; how to individualize instruction with the available facilities; how to motivate the under achievers; how to meet the needs of the slow learner and the culturally disadvantaged. To find solutions to some

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<sup>1</sup>Bach, Leland, "Accounting Education for the 1980's, The Journal of Accountancy." September 1961, p. 53.

of the problems that we face in the classroom, it is imperative that research studies be undertaken, to ascertain the effectiveness of instructional methodology, aids and learning principles as related to accounting instruction.

There is also a need to be more aware of the relationship between the teaching methods and the widely accepted principles of learning. These principles include those basic to all types of learning, as well as those particularly applicable to accounting education. The role of the teacher is changing from that of dispenser of information to that of director and facilitator of learning. Modern teachers must be involved in seeking relevant learning experiences that engage the students in the learning process.<sup>2</sup>

This study attempted to review the scope and the extent to which different instructional methods utilized the principles of learning. Research on teaching methods has indicated that it is essential to integrate the principles of learning with the teaching methodology to achieve optimum instructional efficiency. In this study, the teaching methods in short, is the study of consistencies in the behaviour of the teacher and the impact on the learning

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<sup>2</sup>Popham, L.; Schrag, F.; Blockhus, N., A Teaching - Learning System for Business Education, Gregg Division McGraw-Hill Book Company, 1975. p. 267-290.

process. Different teaching methods emphasize different principles of learning. The teaching method which makes as much use as possible of a wide range of learning principles is bound to produce the desired learning outcomes.<sup>3</sup> The same goals may be achieved with equal efficiency by different teaching methods, efficiency being measured as a function of learning time.

A strong belief is evident among accounting teachers with regard to the importance of accounting as a subject and as a career; but, they fail to agree in the methodology, particularly in the teaching of elementary accounting and bookkeeping. The function of educational research in our preparation for the future is generally accepted as crucial and, in the long run indispensable.<sup>4</sup> Research studies indicate that instruction can be vastly enriched through the acquisition or revision of teaching techniques and materials for classroom use. The business teacher should be an innovator and will find, through his own research and that of his fellow teachers, the one best method of presenting his subject matter.

Accounting is a diverse field and covers a wide

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<sup>3</sup>Gage, N. L., Handbook of Research on Teaching, The American Educational Research Association, Rand McNally and Company, Chicago. p. 448-500.

<sup>4</sup>Calhoun, Calfrey C., Guide to Research in Business Education, National Business Education Association, 1906 Association Drive, Reston, Virginia. p. 40.

range of materials from basic bookkeeping processes to abstract theoretical concepts. This necessitates an equally wide range in educational methodology. To determine the best learning-teaching method to employ is indeed a complex question. However, this is the question for which this study is attempting to find answers. A variety of methods is no doubt essential within a given course and even combination of several methods prove most useful within a single class period. Thus, it is essential that the accounting teachers reevaluate the goals of their courses and reconsider the alternative learning methods and their relationships to these goals.<sup>5</sup>

Educational psychologists have made several discoveries in recent years which will have significant influence over teaching methods in bookkeeping and accounting. Recent developments in learning theory suggest an opportunity for substantial improvement in methods for teaching accounting. "However, some of the laws are false and open to re-examination. If a judgement had to be made on them, it might be that they and many others like them are more false than true."<sup>6</sup> Therefore, there is a need to distill out

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<sup>5</sup>Mitchell, Willy S., Relationship of Laws of Learning to Methods of Accounting Instruction, Accounting Review XXXVIII. p. 414.

<sup>6</sup>Bedford, Norton M., The Laws of Learning and Accounting Instruction, Accounting Review, XXXVIII, p. 407.



their essential truth and to determine the viability of such laws of learning in relation to accounting instruction in high schools.

STATEMENT OF THE PROBLEM

This study was undertaken:

1. to determine the business teacher perceptions of effectiveness of various instructional methodologies used in the first year high school accounting course;
2. to determine the business teacher perceptions of effectiveness of various instructional materials used in the first year high school accounting course;
3. to determine the business teacher perceptions of effectiveness of various principles of learning used in the first year high school accounting course.

STATEMENT OF THE RESEARCH HYPOTHESES

The three general statements of the problem generated the following hypotheses:

1. Is there a difference in the effectiveness of various teaching methods used in the first year high school accounting course?
2. Does the relative effectiveness of the teaching method used in the first year high school accounting course vary as a function of the topic taught?
3. Does the relative effectiveness of the teaching method used in the first year high school accounting course vary as a function of the number of years of experience as an accounting teacher?
4. Is there a difference in the effectiveness of various instructional aids used in the teaching of the first year high school accounting course?
5. Does the relative effectiveness of various instructional aids used in the first year high school accounting course vary as a function of the number of years of experience as an accounting teacher?
6. Is there a difference in the relative effectiveness of various principles of learning used in teaching of the first year high school accounting course?
7. Does the relative effectiveness of learning principles used in the first year high school accounting course vary as a function of the teaching method used?

8. Does the relative importance of the learning principles used in the first year high school accounting course vary as a function of the number of years of experience as an accounting teacher?

NEED FOR THE STUDY

"Accounting educators cannot afford to perpetuate outdated goals and practices in an era characterized by dynamic changes in both the business world and in the educational process. Such revolutionary changes demand that business educators constantly evaluate their objectives, curricula and methods on the basis of sound research in order to meet the present and projected needs of the students."<sup>9</sup>

Teachers have to understand thoroughly the purpose as well as the use of instructional procedures. It is essential to understand why a particular method is used, how to carry it out and to be aware of its effectiveness when teaching particular topics in the accounting curriculum.<sup>10</sup>

We have witnessed during the past few years, programs cut and teacher retrenchment because of decreasing enrollment figures. We see the cost of schools becoming prohibitive for those who once found it relatively easy to afford. Communities seem to be more interested in

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<sup>9</sup>Hoskinson, Robert, E., Weakness of the Past and the Present, National Business Education Association, Washington, D.C.

<sup>10</sup>Byrnside, O. J. Jr., Changing Methods of Teaching Business Subjects, National Business Education Association Yearbook. 1972.

reducing taxes than continuing programs that they once felt were absolutely necessary.<sup>11</sup> There had been a dramatic shift of accountability for learning from the student to the teacher and a trend towards heterogenous grouping of students. This indicates the need for the teachers to update their knowledge through sound research to meet new situations.

The purpose of teaching is to facilitate learning and to achieve this task effectively, the teacher needs to be pupil oriented. "Students must be reached beyond the mere transmitting of accumulated knowledge and methodology - important as that function will always be - by striving to use teaching materials to train receptive minds to be ready to work and grow in the midst of ever-changing patterns in society."<sup>12</sup>

Our nation struggles to increase its productivity in order to control inflation and to compete in world markets; it needs the best in leadership and workmanship to solve these problems. All of which is to say that education increasingly is being judged by the marketplace -

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<sup>11</sup>National Business Education Yearbook No. 14, Business Education Yesterday, Today and Tomorrow; 1976.

<sup>12</sup>Littleton, A.C., Essays on Accounting - Collection Readings Published for the Department of Accountancy, University of Illinois, University of Illinois Press, Urbana, 1961. p. 533.

what it does for and to people and society. Teachers too can participate in this effort to increase productivity, by using more effective instructional methods and materials based on research.<sup>13</sup>

A wide range of ability in a class, creates two difficulties to the teacher. One is the difficulty of presenting the subject matter so that all students will understand. Another difficulty is that students will complete the same portion of work in different amounts of time. If the teacher is to cope with this problem effectively, he should understand the reasons why some students do not work as rapidly as others. The primary aim of this study is to determine the effectiveness of teaching methods and procedures most often used in the accounting classroom. Research of this nature is bound to reflect considerable insight that will circumvent to some degree, the problems in the accounting classes.

It is evident that the task of the business teacher is becoming increasingly difficult: higher expectations from the tax payers and the administrators; rise in the teacher-pupil ratio; the need to instruct two or more courses in the same classroom; to individualize instruction;

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<sup>13</sup>Gregg, W. Davis, Education for Performance, American Assembly of Collegiate Schools of Business, 101 North Skinker Blvd., Prince Hall Missouri, Vol. 10. October 1973. p. 7.

student drop out of accounting classes; to accommodate the slow learner and the culturally disadvantaged. In the light of these facts, it would seem obvious that research of this nature has been a far-felt need. What the future holds for business education may be determined by the kinds, quality, and scope of current research in business education.

The review of literature in accounting indicated that no previous research studies have been carried out with respect to instructional methodology and materials used in the first year high school accounting course. This situation has left a substantial void in the development of educational methodology for high school accounting instruction.

Therefore, this thesis is directed towards the task of filling that void. When research findings are implemented, a proper blending of material and appropriate techniques in teaching will not only provide interest, variety and enriched learning; but, it will make a valuable contribution to the improvement of instruction and development of curriculum in elementary accounting.



### PURPOSE OF THE STUDY

The primary purpose of this study was to determine the effectiveness in the instructional methods, materials and the learning principles that were used in the teaching of the curriculum in the first year high school accounting course. To achieve this task, a survey was conducted by means of a questionnaire on a random sample of accounting teachers in the province of Manitoba.

The data collected from this survey reflected the business teacher perceptions of effectiveness in the teaching of the first year high school accounting course.

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 the needs of both professional staff and students.<sup>14</sup> The review of literature included both the empirical and experimental research related to instructional methodology, materials and learning principles in accounting education.

Hence, the main objective of this study was not only to determine the effective methods and procedures to teach the first year high school accounting; but, to assist

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<sup>14</sup>Bishop, Lloyd K. "Individualize Education Programs", Business Education Forum, Vol. 25, No. 8, 1971. p. 13-14.

those responsible for future revision and improvement of their own courses and curriculum by presenting the modern trends in accounting education.

Accounting is a diverse field and covers a wide range of materials from basic bookkeeping processes to abstract theoretical concepts. This necessitates an equally wide range in educational methodology. To determine the best learning-teaching method to employ is indeed a complex question. However, this was the question for which the study was attempting to find answers.

This study has examined the developments in the instructional methodology, materials and principles of learning and provided an opportunity for substantial improvement in the methods for teaching accounting.

The need for research on accounting education is paramount, since educational programs 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 complex technological and changing culture.<sup>15</sup>

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<sup>15</sup>Ibid.

LIMITATIONS

1. This study is limited by the validity and reliability of the data obtained from the questionnaire.

2. The writer must assume that all replies had been carefully considered and were unbiased. It is possible that some of the questions were ambiguous or may have been misinterpreted, thus resulting in replies that were not totally valid.

3. The adequacy of the survey depended, to what extent the teachers would have answered each question as thoughtfully and frankly as possible. Those accounting teachers who joined the teaching profession in September 1978, may not have had enough time to get acquainted with the teaching methods and materials to be able to pass judgement on their adequacy or effectiveness.

4. The fact that the writer is also an accounting teacher would be a limitation to the study; since, he might have unknowingly made biased statements about accounting instructional methodology and materials.

DELIMITATIONS

1. This survey was limited to teachers of first year high school accounting in the province of Manitoba as at June, 1979.

2. The teaching methods investigated here, referred to broad categories of teachers' roles in the classroom.

3. Selected teaching methods and instructional aids were researched.

4. The survey was conducted by a random sample of first year high school accounting teachers.

DEFINITION OF TERMS

Accounting: The art of recording, classifying, and summarizing, in a significant manner and in terms of money, transactions and events that are, in part at least, of a financial character and interpreting the results thereof.<sup>16</sup>

Bookkeeping: The act or process of keeping a systematic record of business transactions and preparing financial statements.<sup>17</sup>

Lecture: A method of teaching by which the instructor gives an oral presentation of facts or principles, the class usually being responsible for note taking; usually implies little or no class participation by such means as questioning or discussion during the class period.<sup>18</sup>

Lecture-discussion: A method of instruction by which the instructor not only gives an oral presentation of facts but encourages student participation in the discussion of facts already presented to class. It also provides opportunity to reinforce student responses.

Laboratory: In the laboratory method emphasis is upon student performance. Students are encouraged to ask questions and clear up any points which they do not under-

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<sup>16</sup>Good, Carter V., Dictionary of Education, McGraw-Hill Book Company Inc., 1959.

<sup>17</sup>Ibid.

<sup>18</sup>Ibid.

stand after hearing the lecture and reading the textbook assignments. It is a supervised period of work and instruction supplementary to the main lecture portion of the course. At times when there appeared to occur a common difficulty among several members of the group the work is temporarily suspended to permit a review or a detailed explanation for the entire group.

Case: The case study method of instruction is a less structured situation for the student and from the standpoint of learning theory is supported by the principle of discovery learning. Utilizing the case method, the student is allowed to discover relationships and concepts for himself leading to a high degree of student participation in the learning situation.

Simulation: Games present situations similar to the real world conditions and should yield a high positive transfer to the working world. In business games the student is very much an active participant in the learning situation with feedback presented very close to the actual decision-making process.

Instruction Via Television: Instruction via television is one method by which the instructor can reach hundreds, or even thousands of students. The actual class size can vary from one up, depending on the size of the room, the screen or number of screens installed for viewing.

Although the principle of participation and reinforcement does not seem to lend support to television instruction, it is not possible to say definitely that adequate participation and reinforcement cannot be achieved via television instruction.

Programmed Instruction: In this method of instruction, lesson material is presented to the student in a series of small steps with each step consisting of a question to answer, a problem to solve or some other similar activity to be performed. The student is immediately informed as to the correctness of his response and if in error may correct it at once. The uniqueness of this learning process is that the student reasons his way into knowledge, taking one small step at a time. Each step requires thinking and concentration.

Practice Set: This is the drill method. It is based upon the concepts of repetition and conditioning reflex. It integrates all the principles and procedures covered, into one learning situation.

Problem Solving: This is a method of instruction in which the instructor will solve the accounting problem on the chalkboard or with the help of an overhead projector. He will explain every step in the problem and will encourage questions from the students. It provides opportunity for active participation by the students and reinforcement

of student responses.<sup>19</sup>

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<sup>19</sup>Mitchell, Wiley S., op. cit., p. 411-414.



## ORGANIZATION OF THE STUDY

Chapter I presents the problem and describes the procedures used in conducting the study.

Chapter II reviews the literature on accounting instructional methods, materials and learning principles.

Chapter III provides a detailed description of the methodology used in this study. The data from the questionnaire is tabulated with respect to teaching methods, materials, and principles of learning.

Chapter IV contains analyses and results.

Chapter V includes a summary, conclusions and recommendations.

## CHAPTER II

## REVIEW OF LITERATURE

The literature in the field of bookkeeping and accounting was examined for research involving methodology, instructional aids and learning theories related to accounting instruction. Copies of studies were secured at the Faculty of Education library, Faculty of Commerce Library at the University of Manitoba and at the University of North Dakota library. No study was found which undertook to determine the effectiveness of teaching methods used in the first year high school accounting course.

The review of literature in this chapter deals with three main areas of the study undertaken: viz. Instructional methodology, instructional materials and principles of learning.

INSTRUCTIONAL METHODOLOGY

A study was conducted by Frank A. Ross<sup>20</sup> to obtain information concerning teaching procedures for introductory accounting in the five states of Arkansas, Oklahoma, Louisiana, New Mexico and Texas. Questionnaires were sent to 218 accounting teachers representing schools. His findings were as follows:

1. Approximately half of the teachers felt that practice sets were of significant value in introductory accounting.
2. The chalkboard and textbooks were used exclusively by about 60 per cent of the teachers.
3. Only 2 per cent of the schools used large lecture sessions as a means of instruction.
4. Laboratory method of instruction was used very effectively.
5. Visual aids were used by approximately 25 per cent of the teachers but only 20 per cent said they were of significant value.
6. About 15 per cent of the schools taught accounting from the "managerial" point of view.

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<sup>20</sup>Ross, Frank A., "Teaching Procedures in Introductory and Managerial Accounting", Collegiate News and Views, XV, May, 1962. p. 1-6.

Maier<sup>21</sup> studied the methodology of 317 bookkeeping teachers and the achievement of their classes and reported that methods used by teachers of high achieving classes included the following:

1. New units were presented with textbooks closed.
2. Oral drill was given regularly.
3. Practice sets with business papers were used extensively.
4. Instructional and inspirational films on bookkeeping were used.

The purpose of the study made by Larson<sup>22</sup> was to determine the effectiveness of various types of laboratory treatment for beginning college accounting students. He concluded that accounting laboratory can be very effective and it will enhance learning in the basic accounting courses, if efforts are made to teach on an individual basis, given attention to detail, and if information is presented in different ways using available supplementary teaching materials.

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<sup>21</sup>Maier, Thomas D., "Bookkeeping Achievement as Related to Instructional Methodology", Ed. D., Temple University, 1957.

<sup>22</sup>Larson, Harvey Albert, "An Evaluation of Laboratory Teaching Methods for a Beginning College Course in Principles of Accounting", Ph.D. Dissertation Abstract, University of Michigan XXIII, p. 100.

Mead and Ruswinkel<sup>23</sup> list some advantages of the lecture method in teaching of elementary accounting. It enables the department to give a uniform examination to the group and is a means of coordinating course work and assisting in thorough coverage of the subject matter.

The lecture should be used to introduce subject matter, to discuss controversial points, to aid in the development of more difficult concepts and to review material already covered.

McCormic<sup>24</sup> investigated the role of new media in the teaching of college accounting, with particular attention given to the latest technological developments in instructional television, programmed instruction and projective media.

He concluded that, as the pressure from mounting enrollment and a shortage of qualified accounting teachers increase the role of the new media in accounting instruction will become more apparent. The initial innovations of closed-circuit television and large lecture hall classes

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<sup>23</sup>Mead, Stuart B. and Ruswinkel, John W., "The Lecture System in Elementary Accounting", The Accounting Review, January, 1959.

<sup>24</sup>McCormic, F. L., "The New Media in Accounting Instruction: A Study of Current Thought and Practice in University and Public Junior Colleges", Dissertation Abstract, University of Michigan, XXVI, p. 5766.

are likely to develop into more sophisticated systems integrating television, programmed instruction, and projective media to provide greater opportunities for extending the range and effectiveness of the accounting teacher.

Bowman's<sup>25</sup> study included the video-tutorial approach to the teaching of college accounting. The investigator concluded that there is no evidence as a result of the study to believe that the video-tutorial method of instruction is superior to lecture-demonstration method; however, neither is there any evidence to believe that the video-tutorial is not as effective as the lecture-demonstration method.

The Harvard Business School and the case method are so commonly associated, that anyone teaching at Harvard School should be considered as an expert in the case method. A research assistant at the Harvard Business School in writing on the case method, identified the following three factors that are common in the case method of instruction in this school:<sup>26</sup>

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<sup>25</sup>Bowman, Betty R., "A Video-Tutorial Approach to the Teaching of Accounting", Dissertation Abstracts, Virginia Polytechnic Institute and State University, 1977.

<sup>26</sup>Russell H. Hassler, "The Case Method of Teaching Accounting", The Accounting Review, XXV (April, 1950), p. 172.

1. A focus on a business experience. The student is forced to deal with the uncertainties, imperfections and problems of personalities, that characterize the business world.

2. A focus on the particular vs. the general. The case method strives to consider a topic in a specific situation requiring decision and action and attempts to avoid the consideration of a topic in general only.

3. A focus on student participation. The case method emphasizes the active participation of students in case analysis and resulting decision for action. Participation is the most important single factor in the learning process through the case method.

Probably all forms of teaching have as their objectives the imparting of a fund of knowledge and a development of the personal skills and abilities of students to utilize this fund of knowledge.

One of the distinguishing features of the case method is its emphasis upon the development of the personal powers of the student for analysis, judgement and the ability to make and carry out decisions.

The lecture system has been used for many years in elementary accounting courses, especially when the number in the class is large. Although the lecture hour can become subjected to misuse; it should be used to introduce subject matter, to discuss controversial points, to aid in

the development of more difficult concepts and principles, to review material already covered and for the purpose of examinations.

This will make the lecture an integral part of the course, especially if the lecturer is an individual who is able to make the subject matter interesting and understandable to a large group. Due to the nature of this subject matter, the lecturer may have to create an interest on the part of the student to master the material being considered. This may require a change in the approach. One method that may be employed is the use of visual aids, especially slides covering specific points. These slides will not only bring about more efficient use of the available time but also aid in classifying the points being discussed.<sup>27</sup>

An experiment was conducted with a class of 40 students in elementary accounting at Arizona State University to compare the effectiveness of large and small accounting classes. The results of the experiment indicated that the large lecture class had an average of 66.7% while the small class had an average of 74.5%.

Another study was implemented at the same university

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<sup>27</sup>Mead, Stuart B., and Ruswinkel, John W. "The Lecture System in Elementary Accounting", The Accounting Review, XXXIV (1959), p. 130.



by a series of questionnaires to determine the attitudes of both students and teachers of accounting towards lecture approach to elementary accounting instruction. One hundred questionnaires were sent and 62 usable returns were received. Eighteen of the respondents felt that large elementary classes could not be effective even with the use of visual aids, a public address system and laboratory sections; while 44 respondents (71%) felt that large classes could be effective with instructional aids such as: blackboards, transparencies, mimeographed or dittoed material and slides. Opaque projector and filmstrips were slightly less popular.<sup>28</sup>

Henke<sup>29</sup> states that instructional information should be organized into a logical, related body of knowledge. Points which need to be memorized should be pointed out. Objectives of accounting may be stressed such as:

1. To assist management in making decisions relative to the operation of its business ventures.
2. To assist present or prospective creditors and owners in determining their course of action.

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<sup>28</sup>Schattke, Rudy and Leroy, McAllister, "Large Versus Small Classes in Elementary Accounting", The Accounting Review, XXXVII, (July 1962), p. 561.

<sup>29</sup>Henke, Emerson, "Teaching Accounting by Principle and Convention", The Accounting Review, April, 1958.

3. To provide the data necessary for the preparation and support of tax returns.

This approach is one which should stimulate thinking instead of perhaps being involved with the temporary memorization of a body of facts.

House recommends that practice sets be used as a teaching and not a testing device and consequently should be worked both in and out of class. He found no significant difference in scores achieved on objective tests by students taught by the contract method and those achieved by students taught by the daily assignments method.

In his evaluation of the accounting programs in high schools; he suggests that instructors:

1. Teach just one new concept at a time.
2. Precede the assignment of each new topic with both a preview and a presentation of the topic.
3. Promote opportunities for students to obtain part-time work experience in local offices.<sup>30</sup>

Ernst<sup>31</sup> found textbooks inadequate as the major

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<sup>30</sup>House, F. Wayne, Evaluation of the Accounting and Bookkeeping Programs", The National Business Education Quarterly, Winter 1953.

<sup>31</sup>Ernst, Wilma A., "An Analysis of Accounting Systems and Practices with Implications for Improvement of Instruction in Accounting," Ed. D., University of Oklahoma, 1959.

source of information for preparing individuals to fulfill functions in both large and small business.

Current practices and procedures are not necessarily reflected in the textbooks. She suggests that elementary accounting textbooks should include more instructional material relative to suitable records for small businesses that will be simple to maintain yet provide adequate information for management purposes.

Mitchell<sup>32</sup> states that the accounting instructors in their teaching activities do not resort to only one of these methods, but normally employ a very complex combination of many methods:

1. Drill method has been found highly effective in handling problem assignments, completing practice sets and mastering frequent tests.

2. Through lecture the speaker is able to convey his emotions convictions clearly and can stimulate the learner.

3. In the laboratory method emphasis is upon student performance. This method endorses the law that the time to apply the learning is immediately after the student has been thoroughly exposed to and mastered the requisite fundamentals.

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<sup>32</sup>Mitchell, Wiley S., "Relationship of Laws of Learning to Methods of Accounting Instruction", The Accounting Review, XXXVIII, April 1963, p. 411-414.

4. Discussion through directed questions and answers ranges from that related to the transfer of specific knowledge to the explanation of reasons and justification for alternative procedures.

5. The proponents of programmed learning maintain that this almost immediate reassurance that he has responded correctly tends to "reinforce" what he has learned.

6. The seminar method provides an atmosphere in which systematically organized concepts may emerge and free interchange of ideas and opinions will prevail.

7. The case method demands highly active student participation. This method emphasizes the development through application of the tools of logical analysis and the critical review of cause and effect relationship.

8. Self-initiative and motivation are the prime requisites of the project method of learning.

Doney and Neuman<sup>33</sup> conducted a study at the Bowling Green State University, Ohio, in 1964. It was concluded that the use of television as a means of accommodating the increasing numbers of students in elementary accounting provided a teaching method that at least as effective as

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<sup>33</sup>Doney, Lloyd D., and Neuman, Richard C., "Teaching Approaches to Elementary Accounting", The Accounting Review, XL, July 1965, p. 653.

the more conventional approach.

Pike<sup>34</sup> suggests that principles of "Programmed Learning be applied so that the learner may know promptly the correctness of his answers. In working accounting problems a number of decisions must be made and these sequential decisions are not generally shown to be correct to the student as he goes along but rather he is forced to wait until the completion of the entire problem before he knows whether or not his work is accurate.

Wallen and Travers<sup>35</sup> make the following observations in the handbook of research on teaching. Teaching methodology constitutes the consistencies in the behavior of the teacher and the impact of these consistencies on the learning process. It is also called the pattern of teacher behavior or the role of the teacher in the classroom. A teacher's role is represented by a pattern of behavior of the teacher in the classroom and so too is the teaching method. There are certain conditions that generate particular teaching methods. Following classifi-

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<sup>34</sup>Pike, Arthur, "Reinforcement in Learning Accounting", Journal of Business Education, Vol. 37, No. 3, December, 1961.

<sup>35</sup>Wallen, Norman E., and Travers, Robert M. W., Analysis and Investigation of Teaching Method, Handbook of Research on Teaching, Rand McNally & Co., Chicago, p. 448-500.

cation is an attempt to group patterns of teacher behavior in terms of the origin of the pattern:

1. Patterns derived from teaching traditions: A teacher teaches as he was taught.
2. Patterns derived from social learnings in the teacher's background: Teachers reflect the social mores and behavior patterns of the class from which they come or the class with which they are identified by the community.
3. Patterns derived from philosophical traditions: A teacher may follow Rousseau, John Dew or Socratic.
4. Patterns generated by the teacher's own needs: A teacher may adopt a lecture method because he wants to be assertive.
5. Patterns generated by the conditions existing in the school and the community: A teacher conducts his classroom in such a way to produce formal and highly disciplined behaviour, because this represents the pattern required by the principal.
6. Patterns derived from scientific research on learning: Research on teaching methods should begin with the design of teaching methods in terms of scientific knowledge of learning. It is difficult to question the proposition that teaching methods must be built on the basis of an educational philosophy, for different methods are required for achieving different values. Nevertheless, once the values to be achieved have been set, the design of

a teaching method should be based as far as possible on scientific knowledge of learning rather than on folklore.

As we mature in our profession, our knowledge of current office procedures and working conditions may decline. If we are to train students to meet the current vocational needs, we must be aware of the changes that are taking place in the business world. Since this is of continuing concern to all business educators, it is imperative that "work experience refresher programs be conducted to update the teachers' knowledge of changing conditions in the business world."<sup>36</sup>

Since it is a well known fact that all students do not follow the same study technique and achieve at the same rate the traditional accounting classes may be unsuited to many students. One teaching method that will satisfy the needs of students with varying ability levels is the individualized competency-based learning system. In this system the teacher will specify the learning goals in measurable terms. The learner is required to achieve observable behavior changes in knowledge and/or skills to show competency before proceeding to more complex goals. Instructional packages can be used to individualize in-

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<sup>36</sup>Wong, Shirley, The Challenge of Change, Journal of Business Education, April, 1978, p. 297.

struction. The student will progress at his own learning rate and in his own learning style. Working with learning packages, the student will be able to identify the strengths and weaknesses. Students will be advised to recycle when objectives have not been met.

Three patterns of instruction can be used in the individualized accounting laboratory: viz. media presentation, independent study and teacher-student interaction. The teacher will tell, show or demonstrate the subject content by using instructional media in the media presentation. The media that is very useful in the accounting laboratory are the overhead projector, slide projector and video-cassette machine. Subject matter may also be presented through the use of study guides. The study guides will provide the students with brief explanations, summaries and sometimes instructional hints for beginning difficult homework assignments. This enables the student to work independently.

A manual is made available to the student to check the answers to every problem or exercise that he is required to complete. The accounting teacher will work together with the student in small groups as well as on a one-to-one basis. These sessions will give both the teacher and the students a chance to discuss, question and report.

On completion of the instructional activities



students will be required to complete some form of evaluation. These evaluative devices are administered in the form of a problem, an exercise, or an objective type of questions. There are only two basic elements that change when the traditional method is compared with the competency-based teaching method. One, the class-room structure and two the students can progress at a speed that is in keeping with their own learning abilities and style.<sup>37</sup>

Common plan in the teaching of accounting is for the class to proceed through the course in a lockstep pattern. This plan has two basic methods, viz assignment-class-discussion method, and teacher-explanation-demonstration method.

Assignment-class-discussion method. In this method of teaching accounting, the teacher generally begins a new topic by assigning the topic or the chapter to be read and studied from the text. Problems are assigned to be done by the students after completing the reading assignment. The succeeding class periods are devoted to answering questions the students raise. Emphasis is always on answering questions, completing problems and testing. Following are some of the limitations of this teaching method:

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<sup>37</sup>Graham, John E., Competency-Based Accounting Instruction, The Journal of Business Education, January 1977, p. 184-186.

1. It assumes that all students can read, study and understand the textbook.

2. It promotes memorization, not understanding, since the criterion of understanding is being able to submit completed problems and respond to an objective-type test. Some students tend to memorize the entries and procedures but fail to understand the basic principles involved.

3. It encourages copying. If students are unable to read and understand the textbook, they cannot complete their assignment problems. Many resort to copying to avoid failing the course.

4. It failed to create and hold the interest of many students.

5. It results in a high dropout and failure rate.

Teacher-explanation-demonstration method. In this method the teacher explains the new content before it is studied from the textbook by the class members. The teacher will also work one or more problems on the chalkboard or on the overhead projector. The students are not expected to work the problems until the teacher is certain that the students have the necessary background. This instructional method has several advantages:

1. It gives the students confidence. They turn to their textbook reading and problem work with a feeling of assurance.

2. It used the textbook as a teaching aid, not as the major instructional medium.

3. It centers upon the teacher the responsibility for teaching.

4. It permits the use of sound teaching principles.

5. It places a great emphasis on understanding as opposed to memorization. Copying is discouraged because students have confidence in their ability to do the work on their own.

A major disadvantage of this method of teaching accounting is that, it may not provide for differences in the learning rate.

Individualized Study Plan. The obvious limitations of the classgroup plan which forces all students in a class to move through the accounting course at the same speed has caused the utilization of the individualized study or instructional plan. A good individual study plan should have the following features:

1. The material should be self-instructive and self-corrective.

2. The students should be able to test their understanding of the topic as they work through it.

3. The students should be able to have immediate feedback from the self-test through a self-checking device.

4. Recycling material should be provided at the end of each segment so that students can move on to the

next topic only after demonstrating mastery of the work up to that point.

Team Teaching. Under a team teaching plan teachers cooperatively plan the program so as to meet the instructional needs of all the students in the group. All students taking accounting (several class sections) may be assembled for one teacher to make a presentation/or demonstration on one topic. The teacher in charge of each group will review the work assigned. The students may then proceed to individual study in a learning laboratory where each student completes the assigned problems. If needed, students will seek assistance from the teacher in the laboratory.

"A teacher should not use any one method to the exclusion of the others. Variety adds interest to classroom procedures. The wise teacher will be flexible in adapting teaching methods to suit the abilities of the students.<sup>38</sup>

Teachers in six different communities and two different states in the United States cooperated in this venture of finding out how students felt a bookkeeping class should be taught. Each teacher asked his students

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<sup>38</sup>Musselman, Vernon A., and Kaluza, Henry J., et al., Methods of Teaching Accounting, Gregg Division/McGraw-Hill Book Company 1979, p. 20-27.

to write a paragraph or a page about how he felt about this subject. 274 students were included in this survey. Following were the chief observations made by the students:

1. Interesting presentation, good teacher-student relationship, full coverage of material, cooperation and patience on the part of the teacher were cited as essential characteristics to an ideal bookkeeping class.

2. The second most commonly mentioned aspect of an ideal bookkeeping class was practice sets. Students believed that this helped them to "pull all the separate topics together into a meaningful experience".

3. The third most important aspect of an ideal bookkeeping class is teaching materials and equipment. One student's comment was "...I think the instructor should go over every chapter before the student reads it by himself. It seems to help a great deal...." Students recognized that the interest and enthusiasm of the teacher had a direct influence on the attitude and interest of students. Some students believed that, there should be homogenous grouping and provisions for individual differences.

Given below is the summary of the ideas that students expressed of what constitutes an "Ideal Bookkeeping Class". Their ideas are reported in descending order of



frequency of mention:<sup>39</sup>

Teacher characteristics	126
Practice sets	123
Teaching materials and equipment	100
Student interest	69
Homogeneous grouping and provisions for individual differences	33
Visual aids, speakers, field trips	25
More homework and study time	24
Laboratory period	13
Good learning atmosphere	9
Stress chapter questions	8
Teach basic principles and purposes of bookkeeping	7

Cassette media can be used in the teaching of first year bookkeeping and accounting. Teachers can record the lecture on tape and also prepare student guides to correspond the lectures. If the student does not understand a certain concept, he could playback the lecture for further review and reinforcement. This approach enhances individualized learning and the student will progress

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<sup>39</sup>Peters, Joyce, Chairman of the Committee, The Ideal Bookkeeping Class from the Viewpoint of the Students, Business Education Forum, December 1965, p. 11-12.

at his own rate.<sup>40</sup>

Some specific suggestions for emphasizing more learning in the learning-by-doing approach include:

1. Students should actively participate when the accounting teacher is making a presentation on a new concept.

2. Allow as much class time as possible for students to work problems related to the teacher's instruction.

3. Allow students to ask each other questions while they are working problems, but keep them limited to those that can be answered with a yes or no.

4. Walk around the room while students are working. This will encourage students to ask more questions about their difficulties.

5. Work problems out yourself ahead of time instead of depending on a key. This will make the teacher aware of the difficult areas.

6. Don't give students too much help. Students are the ones who need the practice, not the teacher.<sup>41</sup>

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<sup>40</sup>Hampel, Mervin W., Cassettes: A New Approach to Teaching Business Subjects, The Balance Sheet, Vol. LI, No. 9, May 1970, p. 392-393.

<sup>41</sup>Simon, Judith C., Improving Accounting Instruction: Emphasize the Learning in the Learning-By-Doing Approach, The Balance Sheet, Vol. LVIX, No. 6, March 1978, p. 261-263.

The tone and volume of the instructor's voice should be used as a device to emphasize or de-emphasize the importance of what is being said. "Many accounting teachers know how to talk, but they do not know how to use their voice." Accounting teachers should use an abundance of visual aids as well. Students will be more inclined to realize the importance of a specific item if that item is written on the blackboard or on an overhead projector transparency. "The good accounting and bookkeeping teacher is one who keeps the students involved at all times, answers all questions that are asked, explains the theory behind the procedures and uses the voice as a teaching aid."<sup>42</sup>

A study was made to determine if the inclusion of a practice set in the first year bookkeeping course actually improves the understanding of and performance in bookkeeping, and whether or not its inclusion has any effect on the attitude of students about their study and work in the bookkeeping course.

It was concluded that, on tests assigned to measure understanding and application of bookkeeping principles there was little difference in the scores of students who

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<sup>42</sup>Flesher, Dale L., What Constitutes a Good Accounting Teacher, The Balance Sheet, Vol. LVIX, No. 5, February 1978, p. 215.



worked a practice set and those who did not. However, working a practice set helped students to recognize, interpret, and record business papers. It definitely caused students to form favorable attitudes toward their bookkeeping work.<sup>43</sup>

Following are some of the advantages of utilizing problem-solving instructional technique:

1. It increases the variety of instruction in the classroom. If you continually follow one procedure or method of teaching, class sessions become dull and boring.
2. In addition to making the subject more interesting, it motivates and encourages the student to try again.
3. It provides practical applications of content and simulates office conditions.
4. It teaches skills that are expected of the office accounting workers that may best be taught via problem solving, such as the ability to detect errors and to correct them.
5. It gives the student the opportunity to prove

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<sup>43</sup>Durate, Daniel, A Study to Determine the Value of a Practice Set in a First-Year Bookkeeping Course, Master's Thesis. New Britain: Central Connecticut State College, 1966.

to himself that he can apply the principles and theory of the subject. This feeling of accomplishment may be lacking if students are taught by the conventional lecture method and are tested with the conventional objective examination.<sup>44</sup>

In the bookkeeping class, students should be encouraged to flow-chart their thinking about bookkeeping procedures. When a student cannot decide what to do, encourage him to graphically record what he is thinking. In this manner, the teacher may be able to pinpoint the concept the student does not understand.

The thought pattern flow chart may be used whenever applicable. It may be only a few symbols; or it may contain several symbols, depending upon the complexity of the problem and the number of alternatives available to the student as a result of the decision.<sup>45</sup>

The primary objective of SOLE - a simulated office laboratory experience in bookkeeping is to simulate the work done by people in accounting departments of local

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<sup>44</sup>Madsen, Russell D., Update Instruction With Problem Solving, Business Education Forum, December 1971, p. 16.

<sup>45</sup>Gust, Dale D., Using Flow-Charting Concepts in Bookkeeping Instruction, Business Education Forum, November 1970, p. 45.

firms. Short interviews with individuals in those firms should provide useful insights about duties and responsibilities. Students should be assigned positions within the hypothetical company after considering their interests and abilities.

Some salutary features of a simulated office laboratory experience in bookkeeping are:

1. Students benefit because they perform similar work as that is done in a realistic office environment.
2. Teachers become more effective through increased awareness of what is going on in the business community. Through simulation activities, teachers turn more of the responsibility for learning over to the students.
3. The community too, will benefit by having better informed citizenry about its educational program. It also benefits by becoming a partner with the school and a resource learning laboratory for the students. It stimulates both teachers and students.<sup>46</sup>

#### Summary

This section of the review of literature deals with the experimental and descriptive research carried out con-

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<sup>46</sup>Davis, Rose Anne, SOLE Stimulates Students, Business Education Forum, May 1971, p. 43.

cerning instructional methodology in accounting education. The writer has attempted to present the main features, the merits and demerits of different teaching procedures commonly used in accounting.

The review of related research indicated that lecture method may be used to introduce the subject matter and review material already covered. The lecture-discussion method provides greater opportunity for active participation in the learning situation. There is considerable agreement among researchers as to the effectiveness of the laboratory method of instruction. The case method of instruction places great emphasis on the student's ability to analyze and carry out decisions. Seminar method provides an atmosphere in which systematically organized concepts may emerge and free interchange of ideas and opinion will prevail. Problem solving method gives the student the opportunity to prove to himself that he can apply the principles and theory of accounting. It also provides practical application of content and simulate office conditions.

The proponents of programmed learning held the view that almost immediate reassurance that the student has responded correctly "reinforces" what he has learned. Individualized competency-based learning systems satisfy the needs of students with varying ability levels. Assignment-class discussion and teacher explanation-

demonstration methods are two procedures that are often used in the accounting classroom. Individual study plan and team teaching can be used very effectively when teaching accounting. Many other methods of teaching accounting have been reviewed, with a view to point out their contribution in the learning process.

## INSTRUCTIONAL MATERIALS

Instructional materials and media are a tremendous asset to effective teaching. Materials and media assist the teacher in presenting the subject and aid the student in learning. The textbook is of special significance in a bookkeeping class because it contains explanation of accounting principles, definitions of essential terms, illustrative problems and their solutions, review questions and assignments.<sup>47</sup>

Boynton<sup>48</sup> agrees on the importance of the textbook as an instructional tool. He lists and discusses other teaching materials:

1. Teacher's Manual and Solution Booklets. Supplied by most textbook publishers, these are excellent aids to the teacher in planning and presenting material from the textbook.
2. Workbooks and Study Guides. These are usually correlated with the textbook exercises and problems. The apparent advantages in their use are savings in time and paper for both the student and the teacher.

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<sup>47</sup>Musselman, Vernon A., and Johnson, Russell, A., "New Media for Teaching Bookkeeping and Accounting", National Business Education Yearbook, No. 3, Washington, D.C., National Business Education Association, 1965, p. 99.

<sup>48</sup>Boynton, Lewis D., Methods of Teaching Bookkeeping, Cincinnati: South-Western Publishing Company, 1955, p. 165-185.

3. Practice Set. These extended type of book-keeping and accounting problems as nearly as possible, provide actual business conditions in the classroom. Practice sets present opportunity for students to pull the sequence of bookkeeping together in a unifying manner and to see the entire bookkeeping and accounting cycle.

Boynton suggests several audio-visual materials which may be used effectively. Following are among the more valuable audio-visual materials mentioned:

1. The blackboard; or the modern variations in assorted colors for different purposes. Some are mounted on cupboard door type slides and have permanent journal, ledger, or worksheet rulings.
2. The bulletin board.
3. Motion picture films.
4. Film Strips.
5. The opaque projector.
6. The overhead projector.
7. Bookkeeping Charts.

Braden<sup>49</sup> concluded that "the blackboard is the best known and most used of all visual aids in the teaching of accounting. It has a number of advantages for accounting

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<sup>49</sup>Braden, Adnrew D., "The Blackboard Versus Projected Still Pictures in the Teaching of Accounting - An Experiment," The Accounting Review XXIV, October 1954, p. 683.

instruction. It reflects the ability and the personality of the instructor to a greater extent than the majority of visual aids. It is flexible, i.e., additions and changes in an illustration can be made easily. The blackboard is an inexpensive aid, the reproduction can be erased and the same surface used over and over again. It is readily available, being found in nearly every classroom that is used for accounting instruction."

In order to determine the relative values of the slides and the blackboard, he conducted an experiment in his accounting classes at the school of business in Western University. He concluded his findings in the following words:

"However, it appears that one important conclusion is indisputable, i.e., where the amount of detail regarding an accounting topic is great, presentation in the form of slides achieves better results than presentation on the blackboard."

Professor W. J. Fleig<sup>50</sup> of The Ohio State University, who had many years of experience with projected visual aids in accounting instruction listed the following as advantages of slides over the blackboard in the presentation of illustrative materials in the classroom:

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<sup>50</sup>Fleig, W. J., "Use of Slides in Accounting Instruction," The Accounting Review, July 1948, p. 283.



1. Time is saved in placing material before the students. Many types of illustrations using only a few minutes with slides would require the entire period for blackboard presentation.

2. Pictures which may be presented on slides, cannot be placed on the blackboard.

3. The material to be presented must be developed and worked out in advance. While this is possible with blackboards, in many instances it may not be done.

4. A better presentation of form and content. Blackboards have space limitations and illegible handwriting is an additional handicap for some of us.

5. Slides can be used as many times as are needed.

6. Uniformly instruction for multiple sections is facilitated.

Mastro and Hartman<sup>51</sup> conducted a survey at the Pennsylvania State University to determine the effectiveness of teaching auditing by the use of slide-lecture method. They concluded that slide-lecture method is far superior to the conventional methods when teaching particularly large classes.

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<sup>51</sup>Mastro, Anthony J., and Hartman, Frank R., "An Evaluation of a Slide-Lecture Method for Teaching a Large Section of College Auditing," The Accounting Review, XXXV, April 1960, p. 328-329.

Dennis Gordon<sup>52</sup> states that according to leading psychologists 80% of the knowledge is acquired through sight while the remaining 20% is learned through the sense of hearing. The overhead projector reinforced the oral presentation of subject matter in a more interesting, better organized and more understandable manner.

"If the teacher were to use it simply as a substitute for the blackboard, this would be sufficient reason for using the overhead projector. Every accounting classroom should be equipped with an overhead projector."

Millar and Colligan<sup>53</sup> conducted a study using overhead transparencies to teach bookkeeping in a large metropolitan academic high school. The purpose of the study was to determine whether there was any difference in quality of learning, in student interest, and in problems related to lesson planning. Comments made by both students and teachers, were favorable towards the use of the overhead projector and specifically mentioned were such factors as better student interest, faster clarification of student

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<sup>52</sup>Gordon, Dennis, "The Overhead Projector - An Aid in Teaching Accounting," The Accounting Review, XXXVII, January, 1962, p. 121.

<sup>53</sup>Millar, Morris and Colligan, Jerome, "Effectiveness of Overhead Projectors," The Delta Pi Epsilon Journal, Vol. IX, November, 1966, p. 25-29.

difficulties, and greater depth possible from the use of illustrative materials.

Chance<sup>54</sup> studied the feasibility of using colored transparencies in lieu of chalkboard drawings in the teaching of engineering descriptive geometry. He reported the following findings:

1. There was more time for questioning in the transparency group.
2. Students believed that solutions on transparencies were easier to understand. Faculty members preferred the use of transparencies to chalkboard illustrations.
3. The two transparency classes showed a noticeable improvement in the final grades.

Gallantine<sup>55</sup> conducted an experiment in General Botany taught on the college level at the University of Toledo, using groups of students in a large lecture class. The control group was exposed to the lecture method with

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<sup>54</sup>Chance, Clayton W., Experimentation in the Adaptation of the Projector Utilizing Two Hundred Transparencies and Eight Hundred Overlays in Teaching Engineering Descriptive Curricula, Unpublished Ph.D. Dissertation, University of Texas, 1963.

<sup>55</sup>Gallentine, Jerry Lynn, "The Effects of Overhead Projection on Achievement in Biological Sciences at the College Level," The University of Toledo, 1965. Dissertation Abstract, Vol. XXVI, University of Michigan Microfilms, Ann Arbor, Michigan, p. 5128.

diagrams or illustrations drawn on the chalkboard while in the experimental group the same materials were presented through the use of the overhead projector.

Although he found no significant difference between the control and experimental groups, at the .05 level of significance, he concluded subjectively that through the use of the overhead projector there appeared to be an increase in students' ability to think critically as compared to chalkboard instruction.

Television. Studies comparing the effectiveness of televised instruction with face-to-face (conventional) instruction by a teacher represent the largest category of comparative effectiveness. Most of the studies show no significant difference between the achievement of students taught over TV and students taught in the conventional manner.

At the high school level, students taught over TV achieved as much as students taught conventionally. This view has been supported by the research studies carried out by Berger<sup>56</sup> in 1962; Anderson and Vander Meer<sup>57</sup> in 1954;

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<sup>56</sup>Berger, E.J. An investigation of the effectiveness of televised presentation of self-contained television-adapted lesson on enrichment topics in mathematics. Unpublished doctoral dissertation, University of Minnesota, Minneapolis, 1962.

<sup>57</sup>Anderson, G.R., & Vander Meer, A.W., A Comparative Study of the Effectiveness of lessons on Slide rule Presentation via Television and in Person, The Mathematics Teacher, 1954, p. 295-298.

and Champa<sup>58</sup> in 1958.

Occasionally, significant differences in achievement have been found to favor either televised instruction or conventional instruction. For junior and senior high school students, televised instruction was shown to be significantly more effective than conventional instruction for chemistry (University of Alabama 1961).

Differences in effectiveness between instruction by TV and by conventional methods have sometimes been found to vary with ability level. According to a study conducted by Dreber and Beatty<sup>59</sup> in 1958, high-ability students learned significantly more by TV than by conventional methods. On the other hand, conventional methods of instruction were most effective for low-ability students in science as concluded in a research study carried out by Curry<sup>60</sup> in 1959.

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<sup>58</sup>Champa, V.A., Television: Its Effectiveness in Ninth-Grade Science Teaching, AV Communication Review, 1958, 200-203.

<sup>59</sup>Dreber, R.E., & Beatty, W.H., Instructional Television Research. Project #1: An Experiment. School Review, 1957, p. 119-133.

<sup>60</sup>Curry, R. P., Report of Four Experiments in the Use of Television in Instruction. Cincinnati Public Schools, September, 1960, Abstract of Research on Instructional Television and Films, Stanford University, 1964.

Motion Pictures. Lumsdaine<sup>61</sup> and May concluded that from the standpoint of stimulus properties, "films and TV can be considered substantially identical media for many purposes." Studies comparing the instructional effectiveness of films with the effectiveness of face-to-face (conventional) classroom instruction, evidence that most studies do not reveal reliable differences between the two.

In studies conducted at the University, Senior High School, Junior High School and Elementary School levels, no significant difference in achievement were found when students were taught by either motion pictures or conventional instruction in public speaking as revealed in a study carried out by McElroy<sup>62</sup> in 1958.

In a study undertaken by Popham<sup>63</sup> and Sadnavitch

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<sup>61</sup>Lumsdaine, A.A., May, M.A., & Hadsell, R.S., Questions Spliced into a Film for Motivation and Pupil Participation. Learning From Films, New Haven, Connecticut, Yale University Press, 1958, p. 72-83.

<sup>62</sup>McElroy, C.W., An Experimental Study to Determine the Effect of Motion Pictures in Reinforcing Instruction for the Improvement of Speaking Techniques of Students in Beginning Public Speaking Classes. Unpublished Doctoral Dissertation, University of Virginia, 1958.

<sup>63</sup>Popham, W. J., and Sadnavitch, J. M., The Effectiveness of Filmed Science Courses in Public Secondary School, Department of Education and Psychology, State College of Pittsburg, August, 1960.

in 1960, it has been concluded that conventional instruction was significantly better than filmed instruction for high school physics. There are studies that have concluded that motion pictures were as effective as conventional instruction in teaching information and perceptual motor skills.

Filmstrips, Slides and Transparencies. Allen concluded in 1960, that the research up to that time, which compared filmstrips and slides with either silent or sound motion-picture instruction, found in general that such projected still pictures were as effective as silent or sound films in teaching factual information.<sup>64</sup> A study undertaken by Chance in 1960, comparing the use of transparencies to the use of the chalkboard for teaching engineering drawing, concluded that there was a significant difference in favor of transparencies.<sup>65</sup> Slattery upheld that filmstrips, with or without student participation, were significantly superior to the motion pictures.<sup>66</sup>

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<sup>64</sup>Allen, W. H., Audiovisual Communication Research, In C. W. Harris, Encyclopedia of Educational Research, New York, Macmillan, 1960. p. 115-237.

<sup>65</sup>Chance, C.W., Experimentation in the Adaptation of the Overhead Projector Utilizing 200 Transparencies and 800 Overlays in Teaching Engineering Descriptive Geometry Curricula. The University of Texas, 1960.

<sup>66</sup>Slattery, Sister M., An Appraisal of the Effectiveness of Selected Instructional Sound Motion Pictures and Silent Filmstrips in Elementary School Instruction, Catholic University, 1953.

Radio and Recordings. Wiles in his study completed in 1940 held the view that radio instruction produced superior learning as compared to conventional methods.<sup>67</sup> This view has been supported by a similar study undertaken by Miles in the same year.<sup>68</sup> A study made by Wendt and Butts in 1962 concluded that there was no significant difference in instructional effectiveness of tape recording when compared to conventional instruction.<sup>69</sup>

The visual materials capture students' attention, help them to retain more information and make learning more meaningful. Chalkboard is inexpensive, easy to use and available in every business classroom. Business students are capable of learning more in less time, if efforts are made to use the chalkboard correctly. There are many advantages of using the chalkboard in the accounting classroom:

1. All business educators, generally, can use the chalkboard.
2. This visual aid can be used with all business

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<sup>67</sup>Wiles, M. K., The evaluation of school news broadcasts, Unpublished doctoral dissertation, Ohio State University, 1940.

<sup>68</sup>Miles, J. R., Radio and Elementary Science Teaching, Journal of Applied Psychology, 1940, p. 714-720.

<sup>69</sup>Wendt, P.R., & Butts, G.K., Audiovisual Materials, Review of Educational Research, 1962, p. 141-155.



students in all subject areas with little variation.

3. The chalkboard is a good visual technique for reviewing or summarizing to get the essentials of a classroom presentation.

4. This visual device is always available and economical to use.

5. The possibility of variety is almost unlimited.

6. This teaching method has the advantage of animation as it puts life and action in a lesson plan.

7. The use of this visual aid directs attention, since students have a tendency to watch motion.

8. The chalkboard can be used effectively to clarify concepts.

9. The business educator and the students have the chalkboard in common as a focal point.

10. Error can be quickly erased and corrected.

There are some disadvantages of using the chalkboard as a visual aid:

1. The possibility of poor classroom arrangement indicates that this method will not be effective in every situation. The window covering, lights, or condition of the chalkboard may produce eye strain or poor visibility.

2. The use of the chalkboard is limited by the imagination and the writing and drawing ability of an educator.

3. This visual method is temporary in nature, this occasionally making it a disadvantage.

4. If an educator plans to use large amounts of materials, it must be placed on the chalkboard before class time in order to be used effectively during the class period.

5. Adequate time is required to prepare dynamic chalkboard demonstrations.

6. Effective use of the chalkboard requires knowledge of the special tools and techniques available for use on the chalkboard.

7. Innovative use of the chalkboard requires practice and extensive preview with the various chalkboard aids.

Here are some techniques that should be kept in mind when using the chalkboard:

1. Avoid turning your back to the students for a long period while you are writing or drawing on the chalkboard.

2. Keep your writing brief and to the point.

3. Write explanations on the chalkboard point by point.

4. When teaching in the accounting class, using colored chalk would be very effective. Many educators have discovered that yellow chalk has higher contrast value than

white chalk.

5. Try to follow good design techniques of space, size, shape, line and color.

6. Avoid making letters too small and too weak to be seen from the back of the classroom. With a viewing distance from the chalkboard of approximately 30 feet, lettering should be about two inches high. Walk to the back of the classroom and test for readability and glare.

7. Some teachers write with a slant on the chalkboard. This problem can be corrected by placing a dot on one side of the chalkboard and another dot at the same height on the other side of the board. Use the first dot as a starting point and aim your line of writing at the other dot.<sup>70</sup>

Learning materials used in the elementary accounting class include textbooks, workbooks, study guides, programmed materials, learning modules, audiotutorial modules, films, the computer and the television.

Workbooks are an invaluable aid in the accounting class as the papers are correlated with the textbook problems and avoids the task of duplicating and distributing forms. Since the workbook provides for learning, not testing, teachers need not worry about students' copying.

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<sup>70</sup>Hennington, Jo Ann, Innovate with the chalkboard, Journal of Business Education, Nov. 1978, p. 68-71.

Workbooks include study guides and business forms and papers to solve textbook problems. Study guides can be used effectively for self-evaluation. Effectiveness of programmed materials in accounting depends upon students' learning pattern and the quality of the material. They have been found to be more effective in problem solving. When using programmed materials the accounting teacher must take into account the reading level of the students.

Modules or learning packages are effective aids of individualizing instruction. In this, the students must be able to read instructions and carry out certain learning activities. By self-evaluation students will check their own progress. One major advance in accounting instruction is the use of modules that include filmstrips coordinated with an audio cassette. This may be used alone or as a supplement to the textbook and teacher presentations. The question whether students should take data processing after taking a course in accounting or both courses should be integrated has not been resolved. The accounting clerk need not be a computer programmer but he should understand how the data is fed into the computer and must be able to interpret data emerging from the computer. Even elementary accounting classes, students should develop competency in mechanical computational skills. They should use adding machines and electronic

calculators just as workers in an office.<sup>71</sup>

The spoken word and the printed word are very important forms of instruction but greater instructional efficiency can be accomplished if other forms of audio and visual stimuli are supplemented. Various educational objectives represent different kinds of learning and for each kind of learning the conditions of learning will be quite different.<sup>72</sup> The instructional aids vary in the effectiveness depending on the type of learning required and imposed by the educational objectives. If the teacher is aware of the conditions needed for different kinds of learning, it would be easy to select instructional media and it will promote effectiveness in learning. The conditions of learning in turn are made possible by the manipulation of instructional events. The way to provide these instructional events is to apply appropriate stimuli.

Heavy emphasis is placed upon stimulus displays as compared to the degree of emphasis upon responses by the students. For this, there are three reasons: the external conditions are those provided by the teacher, and this includes all what the teacher or the media can supply

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<sup>71</sup>Popham, Estelle L., et. al., A Teaching-Learning System for Business Education, Gregg Division, McGraw-Hill Book Company 1975, p. 287-292.

<sup>72</sup>Gagne, R.M., The Conditions of Learning, New York: Holt, Rinehart and Winston, Inc., 1965, p. 308.

in the form of stimuli, to provide the external conditions of learning. Gagne points out, learning of concepts, principles, and problem solving can take place without the need to evoke particular responses from the student. But, it is imperative that the student be provided with some access to feed back. His efforts in these activities relate to recall, selection, and use of previous acquired competencies. These are some reasons why media is used to present stimuli rather than to evoke particular responses.<sup>73</sup>

The effectiveness of the learning process can be enhanced by the use of multi-media instruction. First, the changing of media will prevent boredom and maintain interest and attention. Secondly, there may be individual differences among students in the relative effectiveness of various media because of the specific characteristics of the stimuli used in the media. Since there is no absolute science of learning and instruction that would guarantee a way by which each child would master the subject matter, there is a justification for a "shotgun" approach, and to use wide variety of instructional media.<sup>74</sup>

Irrespective of the teaching method that is used,

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<sup>73</sup>Briggs, Leslie J., Instructional Media: A Procedure for the Design of Multi-Media Instruction, A Critical Review of Research, and Suggestions for Future Research, American Institute for Research, 1967, p. 12.

<sup>74</sup>Ibid., p. 13.

there are a number of instructional aids available that the accounting teacher can use; which will enhance the effectiveness of his presentation and assist the learning process. Although many spectacular mechanical teaching aids have emerged in the accounting classroom in recent years, the importance of the chalkboard as an instructional aid will never decline. However, the abilities of the classroom instructors vary in handling an effective chalkboard presentation. To be able to make efficient and interesting chalkboard presentations, accounting teachers must keep in mind the following points:

1. Make all illustrations legible.
2. All demonstrations must be simple.
3. Talk directly to the class, not to the board.
4. Plan the demonstration.
5. Chalkboard presentation should be supplementary to the oral presentation and it must not be overused.<sup>75</sup>

When fairly complicated materials are brought to the attention of the students like financial statements, schedules, flowcharts, etc., it is advisable to give them in the form of a printed handout. For this purpose the teacher can either use the ditto or mimeograph equipment in the school. The ditto reproduction is somewhat cheaper,

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<sup>75</sup>American Accounting Association, Accounting Teachers' Guide.

but each master provides only about 200 copies. The mimeograph machine can produce more copies (over 1,000), and the mimeograph master stencil can be preserved and rerun whenever needed.

Charts, Pads and Easels can save considerable time, focus attention, increase interest and prove quite effective, so long, the data presented are large enough to be read easily.<sup>76</sup>

"Psychologists report that the eye is the main gateway to the brain and that the sense of sight is more efficient than the sense of hearing. Sight also adds conviction to what is spoken. Since the words of the instructor may be interpreted differently by each student, audio-visual tools help to convey the actual meaning intended by the instructor."

Overhead projector is a versatile tool to the accounting teacher. He can create his own material, he does not turn his back to the class, he can work in a fully lighted room, if he chooses to prepare transparencies in advance, he can save class time and when the transparencies have been prepared they can be used again and again. When using the overhead projector, the following suggestions will help to achieve effective results:

1. Keep presentations simple.

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<sup>76</sup>Ibid., p. 97.



2. Do not present too much information at one time.

3. Keep the students' attention on the point being discussed. Use sliding masks to disclose information progressively; so that students cannot read ahead.

4. All letters on transparencies should be large enough to be read by students in the last row.

5. Color should be used to emphasize and differentiate.

6. A small pointer or pencil should be used to call attention to important segments of the transparency.

7. The transparency should be placed on the stage of the projector before turning on the lamp.

8. The lamp should be turned off before removing the projectural. The Switch should be used to transfer the students' attention from the instructor to the screen and then back to the instructor.

9. The projector should be kept low and the screen high for maximum visibility.

10. The top of the screen should be tilted forward to correct "keystoning" of the image.<sup>77</sup>

The main advantage of the opaque projector is that when the material to be shown has been placed on the

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<sup>77</sup>Ibid., p. 98.

platen and the platen raised into position, the image is projected immediately in black and white or color (exactly as the original) without any intermediate preparation. This equipment is particularly helpful when the teacher wishes to project students' solutions on the screen for discussion or correction.

There are few disadvantages of using the opaque projector. It cannot be used as a substitute for the chalkboard because, it is not possible for the teacher to write on the material once it is on the platen. The projector must be operated from the back of the room, therefore, when the teacher is operating the opaque projector, he has to talk to the back of the students and walk back and forth if he wishes to use the chalkboard.

Filmstrips can be used to teach basic skills in introductory accounting and to review various topics, since students can grasp the high lights rapidly.

Planned use of films can make a valuable contribution to the educational process. To obtain the maximum benefit from the showing of a film suggestions are offered:

1. Preview the film to determine whether or not the film is satisfactory or read some information about the film.
2. Prepare the students. Tell them the purpose of the objective of the film and what they should look for.
3. Immediately follow the showing of the film with

discussion.

In recent years the use of television as an instructional medium has increased. This is popular in the area of closed circuit television. The advocates of television instruction say that it will reduce the cost of instruction and ease the shortage of qualified and experienced accounting teachers. The effectiveness of instruction by closed circuit television has been examined and most studies have found no significant differences in the amount learned when compared with conventional teaching.<sup>78</sup>

All accounting teachers use at least one visual aid, the chalkboard. It has been said: the chalkboard is the best known and the most used of all visual aids in the teaching of accounting.<sup>79</sup> La Crone compared the viewgraph with the chalkboard and made this conclusion: The presentation of the problem with the viewgraph was much superior to presentation on chalkboard.<sup>80</sup> Gordon points out that, if the accounting teachers were to use the overhead projector

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<sup>78</sup>Ibid, p. 99-103.

<sup>79</sup>Braden, Andrew D., op. cit., p. 683.

<sup>80</sup>La Crone, Paul G., "The Use of Visual Aids in Elementary and Intermediate Accounting to Determine Their Practical Value in the Classroom. The Accounting Review, XXXV, (July, 1960), p. 521.

as a substitute for the chalkboard, this would be sufficient reason for using the overhead projector. Every accounting classroom should be equipped with an overhead projector.<sup>81</sup>

The chalkboard is a very useful instructional tool, but much of what the instructor writes on the chalkboard could be presented much better and much faster through the use of an overhead projector. Teaching aids make it possible to present more information in less time and at the same time it permits the teacher to present more up-to-date information.

F. L. McCormic investigated the role of new media in the teaching of accounting. His major findings are:

1. Technological instructional media currently available appeared to offer opportunities for extending the range and effectiveness of the accounting teacher.

2. The data indicated that planned and supervised use of programmed materials by accounting students provided the scope for improved instruction.

3. The use of programmed instructional materials would extend the services of an accounting instructor to a larger number of students.

He concluded that: "As the pressure from mounting

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<sup>81</sup>Gordon, Dennis, "The Overhead Projector - An Aid in Teaching Accounting," The Accounting Review, XXXVII, (January, 1962), p. 121.

enrollment and a shortage of qualified accounting teachers increases, the role of the new media in accounting instruction will become more apparent. The advent of close-circuit television and large lecture hall classes are likely to develop into more sophisticated systems integrating television, programmed instruction, and projective media to provide greater opportunities for extending the range and effectiveness of the accounting teacher.<sup>82</sup>

Daughtrey contends that the use of audio-visual aids require an understanding of the following principles:

1. They are an aid and not a substitute for teaching.
2. They must teach and aid the learning process, otherwise it will be a waste of time.
3. They must be used as a teaching and learning aid, and not as a decorative item.
4. The use of audio-visual aids must be planned to obtain the maximum benefit.
5. They must be selected on the basis of need and adaptability to the unit that is being taught.
6. They must be used for a definite purpose: To

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<sup>82</sup>McCormick, F.L., "The New Media in Accounting Instruction: A study of Current Thought and Practice in the University and Public Junior Colleges," Dissertation Abstract, University of Michigan XXVI, 5766.

transmit information, stimulate interest and arouse curiosity, to clarify and explain concepts, facts, ideas, to introduce, to culminate, to unify or close the study.

7. They must be used at the appropriate time to enhance learning.

8. They must be current, because outdated visual aids will be a waste of time.<sup>83</sup>

Motion pictures can aid instruction in almost any class. They are particularly adaptable to basic business classes, where concepts and generalizations form part of the learning. Motion pictures can be quite effective when teaching basic accounting procedures. Few disadvantages of using motion picture are:

1. It is impractical to stop the film at a point where a student has a question to be answered.

2. The active participation in the viewing of the film is not visible.

3. Viewing in a darkened room makes notetaking impracticable.

Filmstrips have a distinct advantage over the motion picture, since any frame or picture can be held in view for

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<sup>83</sup>Daughtry, A. S., Methods of Basic Business and Economic Education, South-Western Publishing Co., 1965, p. 232-233.

as long as it is needed. As filmstrips must be shown in a darkened or semidarkened room, they are subject to the same disadvantage regarding notetaking as motion pictures. Slide projectors can be effective in accounting classes to explain basic concepts and for review purposes. The opaque projector like the slide and filmstrip projector, throws an image on a screen in a darkened or a semidarkened room. It differs from slides and filmstrips, since it projects opaque material such as a page from a book or magazine. The number of kinds of illustration that can be used are practically unlimited. One big limitation of the opaque projector is that, the use of a powerful bulb makes it necessary for a fan and a blower to dissipate the heat that is generated. This produces considerable heat and noise in the classroom.<sup>84</sup>

There are many advantages of using the overhead projector:

1. The unit is used in front of the classroom, which need not be darkened allowing students to take notes, whenever they wish.
2. Teacher stands or sits beside the projector facing his class.

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<sup>84</sup>Nanassy, Louis C., et. al., Principles and Trends in Business Education, Bobbs-Merrill Educational Publishing Company, 1977, p. 237.

3. The teacher can write, mark, or draw on transparency while the material is being projected.

4. Almost anything which can be drawn, copied or photographed can be put on a transparency for projection.

5. A roll of cellophane may be placed in the machine to enable the teacher to outline or illustrate as he talks to the class; or he can prepare materials beforehand.<sup>85</sup>

"Use of audiovisual aids frequently create more rather than less work for the teacher and for the student. But, greater and more permanent learning comes about in a shorter period of time when audiovisual technology is employed than when older and more traditional methods of instruction are relied upon solely." The chalkboard is probably the most flexible, convenient, and useful teaching aid available. Textbook illustration is, next to the chalkboard, probably the most important visual aid. Another very important and readily accessible visual aid is the bulletin board. But, it should serve educational rather than decorative purposes. The material displayed on class bulletin boards should apply to a definite lesson or unit of work and it must be changed frequently. Items placed on bulletin boards may bring textbook materials

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<sup>85</sup>Ibid., p. 237-243.



up to date and the display of student work is an effective use of bulletin boards. The overhead projector has become one of the most popular visual aids in teaching business subjects.<sup>86</sup>

The type of instructional aids that a business teacher will use depends on the instructional methods to be employed; and to make these decisions we should consider the type of learning that is expected of the students. When we teach, the students need to have learning activities designed for practice and recall. They must also be supplied with the feedback to inform them of their progress. This is the essence of many psychologically based learning models, in particular those belonging to the behaviourist schools.<sup>87</sup>

#### Summary

Instructional materials are a tremendous help for effective instruction. According to leading psychologists 80 per cent of the knowledge is acquired through sight while the remaining 20 per cent is learned through the sense of hearing. The visual materials capture students' attention, help them to retain more information and make

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<sup>86</sup>Ibid., p. 414-418.

<sup>87</sup>Romiszowski, A. J., The Selection and Use of Instructional Media, Kogan Rage Ltd., 1974, p. 56.

learning more meaningful. The spoken word and the printed word are a very important form of instruction but greater instructional efficiency can be accomplished if other forms of audio and visual stimuli are supplemented.

Various educational objectives represent different kinds of learning and for each kind of learning the conditions of learning will be quite different. Instructional aids vary in the effectiveness depending on the type of learning acquired and imposed by the educational objectives. The research studies investigated in audio-visual instruction indicated that the use of multi-media instruction enhanced the effectiveness of the learning process. It will prevent boredom, creates interest and attention among students.

This part of the review of literature deals with a variety of instructional aids that are often used in the accounting classrooms. The writer has clearly presented the chief characteristics, the advantages and disadvantages of using specific instructional aids. Many studies have been reviewed to determine the effectiveness of teaching with the help of different instructional aids in contrast to conventional teaching.

LEARNING PRINCIPLES

This study will endeavor to find the learning principles originating from various learning theories expounded by different writers. It will examine the feasibility of applying these principles to accounting education. It is, indeed, a basic need that the individual teaching accounting knows the subject matter of accounting, but it is paramount that he has a sound understanding of the principles of learning. Most fields of knowledge have exhibited a deepening interest in psychology and its impact upon their area of knowledge, and accounting has been no different. Yet, many writers on accounting education have been reticent with respect to the integration of learning theories with accounting instruction.

Learning theories have one thing in common, a concern for the change in the behavior patterns of an organism. Learning theories can be divided into two broad classifications: connectionist theories and cognitive theories. Connectionist theorists believe that learning is a matter of connection between stimuli and responses. Cognitive theorists are concerned with the cognitions (perceptions or attitudes or beliefs) that the individual has about his environment, and with the ways these cognitions determine his behavior.<sup>88</sup>

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<sup>88</sup>Hill, Winfred F., Learning: A Survey of Psychological Interpretations, Chandler Publishing Co., 1963, p. 27.

Other writers will break down the cognitive theories into two major types - Gestalt school of thought (field theories) and the purposivists or ego-psychology school of thought. Gestalt psychologists advocate that behavior does not occur in small isolated situations, and as experience is structured into a definite pattern and this pattern is more pronounced in our experience than the details that make it up. Purposivist theorists believe that all behavior is directed toward a goal and that behavior can be understood only in the light of the goal that is sought.<sup>89</sup> Connectionist theories can be subdivided into two categories, the contiguity theories and the reinforcement theories. In the contiguity theory, learning is assumed to depend only on the contiguity of stimulus and response. Watson and Guthrie are two outstanding figures connected with this theory. Reinforcement theory advocates that effects which follow the response, not just contiguity determines the "learning". Thorndike, Skinner, and Hull, were some of the important figures in the reinforcement connectionist theory.

Thorndike concluded that learning occurs only if a reward is supplied after the desired behavior occurs.

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<sup>89</sup>Stephens, J. M., Educational Psychology 2nd Ed., New York: Henry Holt and Company, 1956.

He was the first learning psychologist to include "knowledge of results" as a reward. The impact of Thorndike's reward psychology was to make learning a function of pleasant student-teacher relationships. He also believes that the student must be rewarded immediately after the desired response to strengthen learning. Thorndike claimed to be a "connectionist". He meant by this that he considered that learning resulted from the strengthening of connections or bonds in the brain. It was his contention that the more we learn, the more connections we have, and the more connections we have, the more educated and intelligent we are.<sup>90</sup>

Skinner's conclusions about the strength and value of the rewards that he prefers to call "reinforcers" are of interest to teachers. Punishment, however, may suppress the response temporarily according to Skinner. Skinner pointed out that where there is no control over reinforcement but where reinforcements are likely to occur at random or by chance, organisms will learn to do whatever they happen to be doing at the time of reinforcement. Skinner believes that the teacher must be careful and should know what he is rewarding. Praising a plagiarized paper may well encourage further plagiarism or other

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<sup>90</sup>Bugelski, B.R., The Psychology of Learning Applied to Teaching, The Bobbs-Merrill Company, Inc., 1971, p. 64-67.

irregular methods of preparing assignments. It is his contention that a reinforcing stimulus must be presented very shortly after a response is emitted.<sup>91</sup>

Hull dealing with primary reinforcement restated Thorndike's law of effect in the following manner: Whenever a response is closely followed by a diminution of a drive or a drive stimulus, there will be an increment in the strength of the bond between the response and the stimulus (or stimuli) present at the time the response is initiated. Hull's principle of primary reinforcement is based on three assumptions. First, according to Hull's view, there will be no learning unless a drive (some psychological need) is reduced, and for a drive to be reduced, a drive must be present. This means that motivation is fundamental to learning. The second assumption is that a drive need not be fully eliminated. It need only be diminished. The third assumption is that the learning will proceed in increments - that is, by steps of some unspecified size. He believes that learning is continuous and cumulative and every reinforcement adds strength to the learning.<sup>92</sup>

Lomax and Agnew point out in their book "Problems

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<sup>91</sup>Ibid., p. 95-96.

<sup>92</sup>Ibid., p. 71-78.

of Teaching Bookkeeping" that there are three major laws of learning and five subsidiary laws that are related to accounting education - Thorndike's theory of learning.

These fundamental laws are:

1. Law of readiness
2. Law of exercise
3. Law of effect

The law of readiness has both a general and specific application. By general it means whether the student is ready to learn bookkeeping. By specific it means whether the student is ready to learn a particular task namely to post or to make closing entries. Readiness also refers to the learning environment. The condition of the room, its appearance, light and temperature; the comfort of the desks and the chairs and the personal touch of the teacher must all be as nearly ideal as possible for learning to take place.<sup>93</sup> The law of readiness must also be considered in connection with home and class work assignments. No lesson should be assigned until after the salient points in the lesson have been made absolutely clear to the students.<sup>94</sup>

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<sup>93</sup>Lamox, Paul S., and Agnew, Peter L., Problems of Teaching Bookkeeping, Prentice-Hall, Inc., 1930, p. 80.

<sup>94</sup>Ibid., p. 97.

The law of exercise states that connections are strengthened with use, and weakened with disuse. There are several elements to be considered in connection with this law among them being the question of type of practice, the length of the period of practice, the advantages and disadvantages of the whole versus the part method of learning, and the problem of retention and forgetting. Students learn by doing and learning takes place most effectively when students are expected to apply the principles taught as soon as possible after they have been taught. The bookkeeping teacher must teach things in the context in which they will be used; and he must be certain that students practice the work in the same context. Students must also be given continued opportunity to use their learning or else disuse will result in disintegration of that learning.

Bookkeeping is best learned by applying bookkeeping principles to actual situations through the medium of properly planned exercises and sets. Reasonable time must be allocated for both written work and oral discussion. A well balanced combination of these two methods is necessary to the successful and economical learning of bookkeeping. In teaching the subject, should we teach a little and drill on that and add a little bit more, and in that way try to build up our subject matter, knowledges, skills and ideals, or should we teach with the idea of



covering, as soon as possible, the complete bookkeeping cycle.<sup>95</sup> The latter seems to be the more advisable procedure; a preponderance of evidence seems to show that the "whole" method of learning is better than any "part" method. This plan tends to aid the student to have a clear vision of bookkeeping as a whole and also to help him to understand the connection between the various phases are being properly learned, and which are not being so satisfactorily learned. Those phases in which the student shows weakness must be worked on and drilled on until the difficulties are cleared up. Forgetting may and should be offset in the learning of bookkeeping by the teacher's requiring the students to recall the learned situations soon after they have been learned, then, at intervals, rather short at first and longer and longer as time goes by, the student should further be required to recall these learned situations. Each recall furnishes a base for further building, but should cause that base to be more firmly imbedded in the mind.<sup>96</sup>

The law of effect states that "when the learning act is accompanied or followed by a pleasant state of affairs, that act is likely to be better learned and more

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<sup>95</sup>Ibid., p. 107.

<sup>96</sup>Ibid., p. 110-115.

readily repeated; but when the learning act is accompanied or followed by an annoying state of affairs, the act is not likely to be repeated. The operation of this law depends largely upon the general surroundings, the mind set of the pupils and, to an astonishing degree, upon the attitude of the teacher. Physical environment must be conducive to learning. A feeling of satisfaction should exist through the school experience of the child, if most effective learning is to take place. A pleasant, helpful attitude on the part of the teacher, a willingness to assist the student in his difficulty, a real desire to have his students succeed, all help tremendously in making learning pleasant.

In addition to the three major laws of learning cited above, Thorndike also present five subsidiary laws of learning which can be very appropriately applied to the teaching of bookkeeping. The five subsidiary laws are:

1. The law of multiple response or varied reaction. It is noted that varied responses may be expected in answer to some of the questions. The more involved or the more difficult the problem is the more varied the responses are likely to be.

2. The law of mind set or attitude. Learner's mind set, or attitude toward school, toward the subject, toward the teacher, or toward the lesson have a conditioning effect on the learning result.

3. The law of partial or piecemeal activity. This law points out the fact that students (learners) tend to concentrate their attention on one thing at a time, and, because of that, our teaching content must be broken up into small specific elements.

4. The law of assimilation or analogy. The most effective functioning of this law depends upon two things: (1) in order to learn bookkeeping most effectively the learner must have had some previous experience to which the bookkeeping work will relate and (2) the learner will make these associations most readily when the teacher makes it a point to see that the student realizes the relationship that exists between his past experiences and his new learning situations.

5. The law of associative shifting. According to this law it is possible to get any response for a thing to which a learner is associated and to which he is sensitive. In other words, it is possible to get students to think of things as assets, or of cash received as being debited to cash. After coming in contact with the same situation many times, the neural bond becomes so firmly established it is no longer necessary to reason out a thing, for almost instinctively, we make the proper response.<sup>97</sup>

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<sup>97</sup>Ibid., p. 116-122.

Some psychologists who are not primarily learning theorists have formulated theories of instruction without specifying a formal learning theory on which the theory of instruction is based. One such theorist is Jerome Bruner. Bruner distinguishes between a theory of learning and a theory of instruction by noting that a learning theory is descriptive - it tells how learning takes place. A theory of instruction, he says, is prescriptive - it tells how to improve learning and how to discover the best ways in which something can be learned.

In Bruner's view, "a theory of instruction has four major features." His four features are:

1. A motivational feature: The theory must spell out what experiences develop predispositions for learning.

2. A structural feature: This feature calls for a body of knowledge that can be presented in such a way that the subject matter can be grasped by individuals at various levels of ability.

3. A sequence feature: A pattern or program of the arrangement of a given content must be developed for most effective presentation of the subject matter.<sup>98</sup>

4. A reinforcement feature: Bruner believes that

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<sup>98</sup>Bruner, J. S., Toward A Theory of Instruction, Cambridge, Mass.: The Belknap Press of the Harvard University Press, 1966, p. 278.

because rewards and punishments are extrinsic to the learner, they are unlikely to have the effect on promoting and maintaining learning that intrinsic motives have. He feels that a theory of instruction must recognize student's intrinsic interest in learning. He says that rewards can be helpful in getting a type of learning going but he cautions that unless a learning activity meets the intrinsic motives of the learner, genuine learning is not likely to occur.<sup>99</sup>

Robert Gagne suggests a hierarchical list of eight categories of learning. The list is hierarchical and cumulative in the sense that it proceeds from very simple conditioning type learning, up to complex learning, such as is involved in problem solving. It is cumulative in the sense that there is an adding up effect on the learner.

Gagne distinguishes eight different varieties of learning as given below.<sup>100</sup>

1. Signal learning: This may be equated with the Pavlovian conditioned response. In this type of learning the stimulus and the response must be closely associated in time. The stimulus will not produce the desired learning if it takes place too many seconds before

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<sup>99</sup>Smith, J. M. and Lusteran, op. cit., p. 89.

<sup>100</sup>Gagne, R.M., The Conditions of Learning, Holt, Rinehart, Winston, 1977, p. 38.

the response. People have observed one or more instances of signal learning in household pets; for example, a cat may run when he hears his food dish placed on the floor. In order for signal learning to occur, there must be a natural reflexive emotional response (fear, anger, pleasure) on the part of the learner. The rapidity with which people acquire signal-response connections is significantly related to the level of anxiety with which the individual faces life's problems and decisions.

2. Stimulus-Response Learning: This is different to signal learning in that the response is not a generalized emotional one, but a very precise act. This learning has the following characteristics: the learning is typically gradual, some repetition of the association between the stimulus and the response is necessary and the response becomes more and more sure as the repetition takes place. One good example of stimulus-response learning is the infant's learned response of holding the nursing bottle in the proper position for feeding. The learning conditions can be viewed within the learner and outside the learner. It is evident that there must be a terminating act which provides reinforcement. Taking of food by sucking is the reinforcer that is made contingent upon the performance of holding the bottle. With respect to the conditions outside the learner it is the occurrence of reinforcement contingency. For learning to occur the act must lead to

an external reward, such as food, praise or relief of pain. The shorter the time elapsing between the occurrence of the learned response and the occurrence of reinforcement, the more rapidly learning will take place. For stimulus-response learning to occur there must be correct response followed by immediate reinforcement and repetition.

3. Chaining: This type of learning has the following characteristics: the individual links in the chain must be established, that is each individual skill must be previously learned. The events in the chain must occur in the right order and close together in time. Repetition will result in the desired learning. Reinforcement is necessary and it must be immediate.

4. Verbal Chaining: The conditions for effective learning of verbal chains according to Gagne are: each link must be established previously and link in the individual's mind between the word and the object must be clear. Response differentiation must have taken place; i.e. the individual must know how to say a particular word well enough, so that the key syllable means something to him and can be used as a link with the word.<sup>101</sup> The mental picture of the word or the coding connection must be established.

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<sup>101</sup>Ibid., p. 42.

When conditions within the learner are satisfied, the conditions external to the learner that are required for verbal learning can be summarized as follows:

- 1) The verbal units must be presented in the proper sequence.
- 2) The learner must actively make the responses required by the chain. The responses generate internal stimuli which become a part of the succeeding links in each case.
- 3) Learning is aided by the use of external stimuli that furnish cues or order, for example, the use of mnemonic devices aid learning.
- 4) The individual's span of immediate memory determines the length of a chain that can be learned all at once.
- 5) Confirmation of correct responses must be provided for in the learning situation.

5. Discrimination Learning: This type of learning is often concerned with the distinctive features of stimulus objects. Thus the child learns to respond differentially to the characteristics that serve to distinguish objects from one another: shapes, sizes, colors, textures and so on. The conditions of this type of learning are as follows:

- 1) The learner must learn each unit in isola-



tion.

- 2) The learner must learn the similarities in each class.
- 3) The learner's repetition will aid learning.
- 4) The learner should learn the differences between classes.
- 5) The learner must be provided with prompts or cues.<sup>102</sup>

6. Concept Learning: This learning refers to classifying or categorizing objects on the basis of defining attributes. The learner is required to form images and to be able to think in terms of common characteristics. Following are some of the conditions for learning concepts:

- 1) The learner must know the words for the objects.
- 2) Subject must be presented with several examples and non-examples.
- 3) Must be taught the similarities that exist in the examples.
- 4) Ask the learner to identify examples among a number of examples and non-examples.
- 5) The learner's correct responses must be confirmed, this means condition of reinforce-

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<sup>102</sup>Ibid, p. 47.

ment is present in concept learning.

7. Rule Learning: In a formal sense, a rule is a combination of concepts or a chain of two or more concepts. Some examples are: friction causes heat; as temperature rises, the sale of ice-cream rises. It is a chain that enables an individual to respond to different situations in similar self-regulated ways. The conditions for this type of learning are as follows:

- 1) Simpler types of learning are pre-requisites for rule learning.
- 2) The learner should be informed of the expected responses.
- 3) The learner must be questioned to reinstate knowledge of concepts.
- 4) The teacher must ask the learner to demonstrate knowledge of the rule by giving some examples.

8. Problem Solving: Once a human being has acquired some rules he can combine these rules into a great variety of higher order rules. In doing this he can<sup>103</sup> use what he already knows to solve problems. Following are required conditions for problem solving:

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<sup>103</sup>Ibid., p. 50.

- 1) The learner must know the rules.
- 2) He should be able to recall the rules.
- 3) A discussion of the important elements of the rules will aid the solving of problems.

B. R. Bugelski's theory of instruction can be summarized in the following simple steps:

- 1) A teacher has to know what he wants the learner to do.
- 2) A learner must "know" what is expected of him.
- 3) The teacher must direct or control the attention of the student by one means or another.
- 4) The teacher must provide time for the learning experience.<sup>104</sup>

Skinner's theory is very similar to Thorndike's. Skinner draws a distinction between the two related terms: reinforcer and reinforcement. A reinforcer is the stimulus and the reinforcement is not the stimulus but the effect of the stimulus - the effect of a stimulus that determines whether or not it will be reinforcing. Skinner differentiates between two major classes of reinforcers: positive and negative. Each of these may, in turn, be primary,

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<sup>104</sup>Bugelski, op. cit., p. 286.

secondary, or generalized. A primary reinforcer is a stimulus that is reinforcing without learning, for example, people do not have to learn that eating is a good thing. A secondary reinforcer is a previously neutral stimulus that has become reinforcing by virtue of being repeatedly paired with primary reinforcer. A generalized reinforcer is also a previously neutral stimulus that through repeated pairing with a number of other reinforcers in various situations, has become reinforcing for many behaviors. A positive reinforcer is a stimulus that increases the probability of a response occurring when it is added to a situation. A negative reinforcer has the same effect as a result of being removed from the situation.

A discussion about negative reinforcement leads directly to a consideration of punishment. Reinforcement whether positive or negative, increases the probability of a response occurring, punishment does not - and may indeed have the opposite effect.<sup>105</sup>

Clark Hull is a formal connectionist theorist. The central theme of his theory is built around reinforcement. His six major processes would be reinforcement, generalization, motivation, inhibition, oscillation and

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<sup>105</sup>Lefrancois, G.R., Psychology for Teaching, Wadsworth Publishing Company, Inc., Belmont, California, 1979, p. 44-46.

response evocation. Like Pavlov, Hull had a great respect for individual differences and was careful to include a postulate about them in his systematic theorizing.

The major value of punishment is that it may provide an opportunity to reinforce a more appropriate behavior while the unwanted action is suppressed. The danger of punishment is that it may have positive reinforcement value for some people or that it may raise so much emotion that it disorganizes learning.<sup>106</sup>

Guthrie did not accept the law of effect as advocated by Thorndike and this is the basic difference between their theories. For Guthrie rewards and punishments were equally irrelevant for learning. Guthrie's system defines learning as involving the formation of habits, where a habit is a link between a stimulus and a response. Habits are acquired through contiguity; they require only one presentation of a stimulus followed by the appropriate response, and they are as strong on the occasion of the first pairing as they will ever be. Further more according to Guthrie, a habit can never be broken. That is, once an S - R bond has been established it will never be

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<sup>106</sup>Smith, J. M., and Lusteran, D.D., The Teacher as Learning Facilitator, Wadsworth Publishing Company, Inc., 1979, p. 260.

broken.<sup>107</sup>

Edward C. Tolman believes that an organism's behavior is not affected solely by stimuli and related drives and needs, but that it is determined largely by the organism's expectancy of being rewarded, and by the value attached to that reward.<sup>108</sup> His principle of learning states that the complete act of behavior is initiated by environmental stimuli and physiological states.

The Gestalt theory of learning can be summarized in the following four basic laws of learning:

1. Law of similarity
2. Law of proximity
3. Law of closure
4. Law of good continuation

Freud stresses the importance of anxiety, using it as a drive (motivating force) similar to the nature of drives included in Hull's learning theory.

Among the many authors who have attempted to analyze the major learning theories and to determine the principles of learning common to each group Johnson's study is the more recent one. The objective of his study was to integrate the learning theory with accounting education. In

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<sup>107</sup>Ibid., p. 26.

<sup>108</sup>Ibid., p. 306.

pursuance of this study he has critically examined many learning theories to elicit the main learning principles embedded in the respective learning theories. His description of the learning principles found in each of the three major groupings of theorists are as follows, beginning with the connectionist (stimulus-response) theory of learning. He makes reference to Garry<sup>109</sup> as the major source of reference.

CONNECTIONIST:

1. The learner should be active rather than a passive listener or viewer. The S-R theory emphasizes the significance of the learner's response, and "learning by doing" is still an acceptable slogan.

2. Frequency of repetition is still important in acquiring skill, and in bringing enough over learning to guarantee retention. One does not learn to type, or to play the piano, or to speak a foreign language, without some repetitive practice.<sup>110</sup>

3. Reinforcement is important; that is, repetition should be under arrangements in which correct

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<sup>109</sup>Garry, Ralph, The Psychology of Learning, Washington, D.C., The Center for Applied Research in Education, Inc., 1963.

<sup>110</sup>Johnston, W.A., An Integration of Learning Theory and Accounting Education, Doctoral Dissertation, University of Illinois, 1965, p. 14.

responses are rewarded. While there are some lingering questions over details, it is generally found that positive reinforcement (rewards) are to be preferred to punishment, especially when the latter is not a natural consequence of the misbehavior.

4. Generalization and discrimination suggest the importance of practice in varied contexts, so that learning will become (or remain) appropriate to a wide (or more restricted) range of stimuli.

5. Conflicts attendant upon generalization and discrimination have consequences that may be unintended by the person attempting to manage the learning. Many of these consequences as studied by Neal Miller are the kind that interest students of psychopathology.

6. Drive conditions are important to learning, but all personal-social motives do not conform to the drive interpretations of Hall and Spence. Anxiety, as measured by the Taylor scale, appears to act as a drive should, but achievement motivation apparently does not.<sup>111</sup>

Crucial to most connectionist theories are the principles of active response and reinforcement. Johnston contends that the principle of frequency is important in that it allows the principles of active response and

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<sup>111</sup>Ibid., p. 14.



reinforcement to function. Generalization and discrimination are important, since it suggests ways to teach for transfer. The principle of drive acts as the motivating force.

#### COGNITIVE:

The principles of learning enunciated by the cognitive theory are as follows:

1. A learning problem should be so structured and presented that the essential relationships are open to the inspection of the learner. The perceptual aspects of the problem represent important features.
2. The direction from simple to complex is not from arbitrary meaningless parts to meaningful wholes, but instead from simplified wholes to more complex wholes. This suggests that we need to study the psychological organization of knowledge and should not deal mechanically with the part-whole problem.
3. Learning with understanding is more permanent and more transferable than rote learning or learning by formula. This generalization gives point to the similar emphasis within S-R on meaningfulness as a factor making for ease of acquisition and recall.
4. Cognitive feedback establishes probabilities and (in some cases at least) is an appropriate explanation of effective reinforcement. The corresponding S-R principle is that of knowledge of results. The notion is

that the learner tries something provisionally, and confirms his attempts by its consequences.

5. Goal setting by the learner is important as motivation for learning, and his successes and failures all determiners of how he sets his future goals.

The principles of learning included in the cognitive theory emphasize the internal activities of the organism (primarily the brain). Perceptual aspects of the learning situation are central to the cognitive theory. Principles of understanding and meaningfulness refer to the teaching methods related to wholeness. The principle of cognitive feedback is similar to the reward advocated by the connectionist theories.<sup>112</sup>

#### Ego-Psychology:

The following principles of learning are the basis of the "Purposivist" or ego - psychology theory.

1. The learner's abilities are important, and provisions have to be made for the slower and more rapid learners.

2. Some abilities are a matter of physiological and social development and knowledge of development should be related to the demands made on the learner. Some such knowledge may turn out to be very important, e.g., in the

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<sup>112</sup>Ibid., p. 15.

teaching of reading and spelling.

3. Personality is a social product, hence it is important to be aware of the culture and subculture as they are relevant to what and how the learner can learn.

4. Anxiety level, especially the "text anxiety" of Mandler and Sarason (1952), appears important in determining the beneficial (or detrimental) influence of praise and blame. The generalization appears justified that with some kinds of tasks high-anxious learners perform better if not reminded as to how well (or poorly) they are doing, while low-anxious learners do better if they are interrupted with comments on their progress.

5. The same objective situation may tap appropriate motives of one learner and not of another. The contrast, for example, between those high in achievement motivation and those high in affiliation motivation and those high in affiliation motivation has been reported.<sup>113</sup>

6. The organization of motives and values in the individual is relevant. Some long-range goals offset short-range activities. For example, college students of equal ability do better in courses perceived as relevant to their majors than those perceived as irrelevant.

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<sup>113</sup>Ibid., p. 17.

7. The group atmosphere of learning (competitive vs. cooperative, authoritarian vs. democracy, individual isolation vs. group identification) will affect satisfaction in learning as well as the products of learning.

The principles of learning underlying the ego-psychology recognize individual differences among students. The principles given above, all relate to this one basic concept and to the principle of motivation. This theory has very limited proponents. It does point out the need for consideration of individual differences, not only in ability, but also in learned drives and need structures.

Johnson has reviewed a number of learning theories and has synthesized these diverse theories into a single body of learning principles that can be applied effectively for teaching of accounting. Following are the principles of learning that he found to be most representative of a universal body of learning principles. They are acquired from both the stimulus-response psychology and cognitive psychology and are interrelated with one another.

1. Principle of active participation. The learner should be involved with the learning situation and not just a passive observer. This activity would not have to be physical.

2. Principle of reinforcement. The learner should be reinforced in the learning situation. This reinforcement should be positive in nature whenever possible, in-

cluding necessary feedback to the learner, being as contiguous in nature as is possible in the learning situation.

3. Principle of discovery. The learner should discover relationships and principles himself, rather than having these relationships and principles demonstrated to him.

4. Principle of meaningfulness. The material should be as meaningful as possible in nature and be readily internalized into the cognitive structure of the learner.

5. Principle of sequence. The material should be organized in such a way as to move logically to the end goal, and that should be clearly in sight.

6. Principle of motivation. The learner must be motivated to learn. This should be intrinsic, positive motivation whenever possible.

7. Principle of transfer. The material should be taught in such a way as to facilitate proper transfer to other situations.<sup>114</sup>

There are many well-articulated theories about teaching. Each of these theoretical perspectives examines teaching and learning from a different vantage point and thus suggests different educational practices. The

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<sup>114</sup>Johnson, op. cit., p. 205-212.

behavioristic perspective is about observable behavior and using the principles of reinforcement as its primary tool. The affective perspective centers on feelings and suggests that teachers must deal openly with feelings both in classroom interpersonal relationships and in the curriculum. The cognitive perspective, which, like the affective perspective, grows out of a phenomenological view of human beings, calls attention to thinking within the classroom and stresses matching learning experiences to the intellectual level of each student. Finally, the social systems perspective sees the classroom as a complex social environment and recommends an understanding of group dynamics to promote interaction and communication among all class members.<sup>115</sup>

#### Summary

The review of literature dealing with the theories of learning has attempted to ascertain the major principles of learning advocated by different learning theorists. The learning theories can be divided into two broad classifications: connectionist and cognitive theories. Connectionist theorists believe that learning is a matter of connection between stimuli and responses. Cognitive

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<sup>115</sup>Smith, J. M., and Lusteran, D.D., op. cit. p. 69-74.

theorists are concerned with the cognitions - perceptions or attitudes or beliefs that the individual has about his environment, and with the ways these cognitions determine his behavior.

The cognitive theories can be broken down into two major types - Gestalt and Purposivists or Ego-psychology school of thought. Gestalt psychologists advocate that behavior does not occur in small isolated situations. Purposivist theorists believe that all behavior is directed towards a goal and that behavior can be understood only in the light of the goal that is sought.

Connectionist theories can be sub-divided into two categories, the contiguity and the reinforcement theories. In the contiguity theory, learning is assumed to depend on the contiguity of stimulus and response. Watson and Guthrie are two prominent figures advocating this theory. Reinforcement theory believes that effects which follow the response, not just contiguity determines "learning". Thorndike, Skinner and Hull were some of the important advocates of reinforcement connectionist theory.

Lomax and Agnew point out in their book "Problems of Teaching Bookkeeping" that there are three major laws of learning and five subsidiary laws that are related to accounting education.

Jerome Bruner distinguishes between a theory of learning and a theory of instruction. A theory of

learning, he says, is descriptive while a theory of instruction is prescriptive; it tells how to improve learning and how to discover the best ways in which something can be learned. In Bruner's view, a theory of instruction has four major features - motivation, structure, sequence and reinforcement.

Robert Gagne suggests a hierarchical list of eight categories of learning. The list is hierarchical and cumulative in the sense that it proceeds from the very simple conditioning type learning, up to complex learning, such as is involved in problem solving. It is cumulative in the sense that there is an adding up effect on the learner. He distinguishes eight different varieties of learning, viz., signal learning, stimulus-response learning, chaining, verbal chaining, discrimination learning, concept learning, rule learning and problem solving.

B. R. Bugelski's theory of instruction includes the following principles: teacher must know what is expected of him, the teacher must direct the attention of the student, teacher must know what he wants the learner to do and the teacher must provide time for the learning experience.

W. A. Johnson has reviewed a number of learning theories and has synthesized these diverse theories into a single body of learning principles that can be applied



effectively for teaching accounting. Following are the principles of learning that he found to be most representative of a universal body of learning principles: principle of active participation, reinforcement, discovery, meaningfulness, sequence, motivation and transfer.

## CHAPTER III

## METHODOLOGY

SUBJECTS

The purpose of this study was to determine the business teacher perceptions of effectiveness in terms of teaching methods, materials and learning principles used by the first year high school accounting teachers in Manitoba. The primary source of information was a random sample of 50 first year high school accounting teachers in the said province. In his search for related literature, the writer was unable to locate any study directly related to the effectiveness of teaching the first year high school accounting course in Canada. However, there have been few studies carried out in the United States that have provided some insight to the development and refinement of this research project.

PROCEDURE

In the pursuit of this study, a questionnaire was administered to a sample of 50 first year high school accounting teachers in the province of Manitoba. The numerical size of the population was 160. This sample was selected in absolute compliance with the principles of random sampling. The writer did not undertake a survey of the entire population due to the high cost of processing of data, limited time available and to avoid a low percentage of returns. By selecting a random sample, with the help of a table of random numbers, the author attempted to make the sample representative of the population as every member of the population had an equal chance of being included in the sample.

A high degree of precision was maintained for this sample survey, because many potential sources of difficulty were uncovered by implementing a pilot survey. A sample is adequate when it is precise enough to allow the required confidence to be placed on the dependability of its results.

A list of names and addresses of those teachers who were teaching the first year high school accounting course in Manitoba was obtained from Miss I. Dryden, Consultant in Business Education.

The questionnaire was presented to a class of students at the pre-masters' in Business Education at the

University of Manitoba, before conducting a pilot study to uncover the shortcomings of the questionnaire. Every questionnaire distributed accompanied a self-addressed, stamped envelope for the convenience of the respondents. Although few had misunderstood certain questions and some had completely abstained from answering specific questions, on the whole, the survey was successful.

The author received 40 returns from a sample of 50 teachers. Often the question is asked "What is an adequate percentage of returns to allow conclusions to be drawn?" Hopkins<sup>116</sup> states that "only rarely, if ever, will the returns be close to 100 per cent. More important than percentage of returns is the study of possible bias in the returns and according to him, 70 percent returns is considered to be very good." He also points out that "demonstrated lack of response bias is far more important than a high response rate." However, lack of response bias is associated with high response rate.

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<sup>116</sup> Hopkins, Charles D., Educational Research A Structure for Inquiry, Indiana State University, Charles E. Merrill Publishing Company, 1976, p. 147.

THE INSTRUMENT

The questionnaire used in this study is found in the Appendix of this paper. It contains ten major questions which reflect the focal point of this study. These ten questions refer to three major areas of this research project: namely, instructional methods, materials and learning principles used in the first year high school accounting course in Manitoba.

The questionnaires were mailed in May, 1979 and the respondents were given approximately two weeks to return the completed questionnaires. A letter of transmittal accompanied the questionnaire which explained the nature and purpose of the study undertaken. It also indicated, in no uncertain terms, that the names of the responding teachers would be confidential and each questionnaire was identified only by number.

The questionnaire also provided space for any comments and concerns with respect to the teaching of Accounting 202, that the teachers would like to share with the writer. In early June, 1979 a reminding letter was mailed to those teachers who had still not returned the questionnaire. Most of the teachers living out of the city of Winnipeg were prompt in returning the questionnaire. By the end of June 1979, 80 percent of the questionnaires were received.

Every attempt was made to reflect quality in the questionnaire because many people expect similar adequacy in the overall study and would be willing to contribute to its success.<sup>117</sup> The preparation of an instrument capable of delivering the necessary data involved three main aspects. The researcher must first ask a question that is definite and clearly presented and one that generates an answer that is definite and quantifiable. Second, the format of the questionnaire must be structured so that the respondent will have no difficulty in recording his/her response and will not miss any item entirely and it must be composed of a logical sequence of questions. Third, the instrument must be sharpened so that all ambiguity is eliminated.<sup>118</sup>

The following principles were followed closely by the author when he constructed the questionnaire instrument which was used for this study.

1. An attempt was made to convince the respondents that the problem chosen was important enough to justify their assistance to find a solution.

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<sup>117</sup>Mouly, George J., The Science of Educational Research, Van Nostrand Reinhold Company, 1970, p. 189.

<sup>118</sup>Hopkins, op. cit., p. 145.

2. The author weighed the advantages and disadvantages of using the questionnaire method to gather data, before it was finally utilized.

3. Literature relating to questionnaire techniques were reviewed many times with a view to achieve refinement and quality in the instrument.

4. Considerable time was spent in the planning of the investigation, before making use of the questionnaire.

5. Attention was devoted to ascertain a favorable period during which time the questionnaire should be sent. However, it was not possible to avoid the distribution of the questionnaires in May 1979, at a time the teachers were busy getting ready for the final student evaluation.

6. The author showed consideration for the persons involved in the survey by not disclosing their identity and by offering to mail a summary of the findings if requested.

7. The questionnaire contained only the essential items, thereby preventing it from becoming too lengthy, which would have discouraged replies from the respondents.

8. Every attempt was made to express each question with clarity and precision.

9. The questionnaire was so designed to make the task of replying simple and easy as possible.

10. The author conducted a pilot study before it was finally administered on the sample population.

11. The questionnaire accompanied a letter of transmittal, which explained the nature and purpose of the study.

12. The questionnaire was followed up by a reminding letter to increase the rate of returns.<sup>119</sup>

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<sup>119</sup>Mouly, op. cit., p. 263.



DATA ANALYSES

For each of the three general areas of interest (Instructional Methodology, Instructional Materials, and Learning Principles), descriptive statistics were calculated from the data obtained from the questionnaire.

To test the hypotheses pertaining to "Instructional Methodology", a three-way Experience X Instructional Methodology X Topic repeated measures ANOVA was conducted. "Experience" was a between subjects factors with four levels while "Instructional Methodology" and "Topic" were within subjects factors with seven levels each. A two-way Experience X Instructional Materials repeated measures ANOVA was used to test the hypotheses pertaining to "Instructional Materials". Again, "Experience" was a four-level within subjects factor while "Instructional Materials" was a nine-level within subjects factor. Finally, hypotheses pertaining to "Learning Principles" were investigated using a two-way Experience X Learning Principles repeated measures ANOVA where "Experience" was a four-level between subjects factor and "learning Principles" was a seven-level within subjects factor.

As per hypothesis error rate equal to .05 was set for all analyses. In addition, in all analyses, statistically significant effects from the ANOVA's were probed by performing all possible pairwise contrasts among the relevant means using the Tukey criterion of significance to control the probability of a Type I error.

CHAPTER IV  
ANALYSIS AND RESULTS

DEMOGRAPHIC DATA

The demographic information on the sample is given in Tables 1 to 3. The survey results indicate that 35.9 per cent of the sample has 10 or more years experience in the teaching profession. Table 2, illustrates that 12.8 per cent of the sample has over 10 years of experience as an accounting teacher. Finally Table 3, shows that 61.5 per cent of the sample has a first or second degree.

INSTRUCTIONAL METHODOLOGY

The descriptive statistics pertaining to the factor 'Instructional Methodology' are presented in Table 4, which illustrates that over 50 per cent of the sample favor the lecture-discussion method to the laboratory method.

Tables 5, A to G describe the effectiveness of the different teaching methods used when teaching the first year high school accounting course. The survey results show that laboratory, problem solving, lecture-discussion and practice set are some of the preferred teaching methods that teachers use, which will produce optimum instructional efficiency.

STATISTICAL HYPOTHESES:

1.  $H_0$  : There is no difference in the effective-

TABLE 1

FREQUENCY (f) DISTRIBUTION OF EXPERIENCE  
IN THE TEACHING PROFESSION TO JANUARY 31, 1979

YEARS	f	PERCENTAGE ADJUSTED FOR ABSTENTIONS
1 - 2	2	5.1
3 - 5	11	28.2
6 - 9	12	30.8
10 & OVER	14	35.9
ABSTAINED	1	.0
TOTAL	40	100.0

TABLE 2

FREQUENCY (f) DISTRIBUTION OF EXPERIENCE  
AS AN ACCOUNTING TEACHER TO JANUARY 31, 1979

YEARS	f	PERCENTAGE ADJUSTED FOR ABSTENTION
1 - 2	6	15.4
3 - 5	15	38.5
6 - 9	13	33.3
10 & OVER	5	12.8
ABSTAINED	1	.0
TOTAL	40	100.0

TABLE 3

FREQUENCY DISTRIBUTION OF PROFESSIONAL QUALIFICATIONS  
OF THE SAMPLE SURVEYED

QUALIFICATIONS	f	PERCENTAGE ADJUSTED FOR ABSTENTION
BUSINESS EDUCATION CERTIFICATE	15	38.5
BACHELOR OF EDUCATION (NEW)	8	20.5
BACHELOR OF EDUCATION (OLD)	13	33.2
BACHELOR OF PEDAGOGY	1	2.6
PRE-MASTERS '	1	2.6
MASTER OF EDUCATION	1	2.6
ABSTAINED	1	.0
TOTAL	40	100.0

TABLE 4

FREQUENCY DISTRIBUTION OF PERSONS FAVORING  
LECTURE-DISCUSSION TO LABORATORY METHOD

RESPONSES	f	PERCENTAGE ADJUSTED FOR ABSTENTION
FAVOR	19	50.0
DO NOT FAVOR	9	23.7
SAME	10	26.3
ABSTAINED	2	.0
TOTAL	40	100.0

TABLE 5 (A)  
 FREQUENCY DISTRIBUTION OF THE TEACHING METHODS USED TO TEACH ACCOUNTING EQUATION,  
 ANALYZING TRANSACTIONS & USING ACCOUNTS

RESPONSE	LECTURE		LECTURE DISCUSSION		LABORATORY		PROBLEM SOLVING		CASE		PRACTICE SET		SIMULATION	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
IT IS OF LITTLE HELP	4	13.8	1	2.9	1	3.1	0	.0	5	21.7	5	20.0	4	21.1
CAN BE HELPFUL	6	20.7	4	11.4	1	3.1	1	2.8	8	34.8	2	8.0	2	10.5
IMPORTANT BUT NOT ESSENTIAL	4	13.8	5	14.3	3	9.4	6	16.7	3	13.0	4	16.0	6	31.6
ESSENTIAL	12	41.4	15	42.9	10	31.3	11	30.5	4	17.5	2	8.0	2	10.5
HIGHLY ESSENTIAL	3	10.3	10	28.5	17	53.1	18	50.0	3	13.0	12	48.0	5	26.3
ABSTAINED	11	.0	5	.0	8	.0	4	.0	17	.0	15	.0	21	.0
TOTAL *	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

TABLE 5 (B)  
 FREQUENCY DISTRIBUTION OF THE EFFECTIVENESS OF THE TEACHING METHODS USED  
 TO TEACH JOURNALIZING AND POSTING

RESPONSE	LECTURE		LECTURE DISCUSSION		LABORATORY		PROBLEM SOLVING		CASE		PRACTICE SET		SIMULATION	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
IT IS OF LITTLE HELP	6	26.1	1	2.9	0	.0	1	2.9	4	17.4	1	3.3	2	8.7
CAN BE HELPFUL	5	21.7	2	5.7	0	.0	1	2.8	4	17.4	4	13.3	2	8.7
IMPORTANT BUT NOT ESSENTIAL	2	8.7	5	14.3	2	5.9	3	8.3	3	13.0	7	23.3	5	21.7
ESSENTIAL	6	26.1	14	40.0	12	35.3	9	25.0	4	17.4	4	13.3	6	26.1
HIGHLY ESSENTIAL	4	17.4	13	37.1	20	58.8	22	61.0	8	34.8	14	46.8	8	34.8
ABSTAINED	17	.0	5	.0	6	.0	4	.0	17	.0	10	.0	17	.0
T O T A L *	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION



TABLE 5 (C)

FREQUENCY DISTRIBUTION OF THE EFFECTIVENESS OF TEACHING METHODS USED TO TEACH THE TRIAL BALANCE, FINANCIAL STATEMENTS & CLOSING LEDGER

RESPONSE	LECTURE		LECTURE DISCUSSION		LABORATORY		PROBLEM SOLVING		CASE		PRACTICE SET		SIMULATION	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
IT IS OF LITTLE HELP	3	14.3	1	3.1	0	.0	1	2.9	5	20.0	0	.0	3	11.1
CAN BE HELPFUL	4	19.0	1	3.1	1	2.9	1	2.9	3	12.0	2	6.5	2	7.4
IMPORTANT BUT NOT ESSENTIAL	7	33.3	3	9.4	1	2.9	3	8.8	4	16.0	8	25.8	8	29.6
ESSENTIAL	5	23.8	21	65.6	12	35.3	8	23.5	6	24.0	4	12.9	3	11.1
HIGHLY ESSENTIAL	2	9.6	6	18.8	20	58.9	21	61.9	7	28.0	17	54.8	11	40.8
ABSTAINED	19	.0	8	.0	6	.0	6	.0	15	.0	9	.0	13	.0
T O T A L *	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

TABLE 5 (D)  
 FREQUENCY DISTRIBUTION OF THE EFFECTIVENESS OF TEACHING METHODS USED TO TEACH  
 BANKING, CASH RECEIPTS AND PAYMENTS JOURNAL

RESPONSE	LECTURE		LECTURE DISCUSSION		LABORATORY		PROBLEM SOLVING		CASE		PRACTICE SET		SIMULATION	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
IT IS OF LITTLE HELP	4	18.2	1	2.9	1	2.9	0	.0	3	11.5	0	.0	0	.0
CAN BE HELPFUL	5	22.7	3	8.6	0	.0	0	.0	3	11.5	2	6.7	2	8.3
IMPORTANT BUT NOT ESSENTIAL	6	27.3	3	8.5	2	5.7	4	11.8	5	19.2	8	26.7	5	20.8
ESSENTIAL	5	22.7	21	60.0	12	34.3	8	23.5	5	19.2	4	13.3	4	16.7
HIGHLY ESSENTIAL	2	9.1	7	20.0	20	57.1	22	64.7	10	38.6	16	53.3	13	54.2
ABSTAINED	18	.0	5	.0	5	.0	6	.0	14	.0	10	.0	16	.0
T O T A L *	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

TABLE 5 (E)  
 FREQUENCY DISTRIBUTION OF THE EFFECTIVENESS OF TEACHING METHODS USED TO TEACH THE PAYROLL

RESPONSE	LECTURE		LECTURE DISCUSSION		LABORATORY		PROBLEM SOLVING		CASE		PRACTICE SET		SIMULATION	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
IT IS OF LITTLE HELP	4	16.7	1	3.0	1	2.8	1	3.2	5	22.7	2	6.3	3	12.5
CAN BE HELPFUL	5	20.8	3	9.1	1	2.8	0	.0	3	13.6	1	3.0	1	4.2
IMPORTANT BUT NOT ESSENTIAL	5	20.8	7	21.2	2	5.6	3	9.7	2	9.1	6	18.8	5	20.8
ESSENTIAL	8	33.4	13	39.4	13	36.0	11	35.5	6	27.3	7	21.9	5	20.8
HIGHLY ESSENTIAL	2	8.3	9	27.3	19	52.8	16	51.6	6	27.3	16	50.0	10	41.7
ABSTAINED	16	.0	7	.0	4	.0	9	.0	18	.0	8	.0	16	.0
T O T A L *	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

TABLE 5 (F)  
 FREQUENCY DISTRIBUTION OF THE TEACHING METHODS USED TO TEACH  
 PROCESSING OF PURCHASES AND SALE OF MERCHANDISE

RESPONSE	LECTURE		LECTURE DISCUSSION		LABORATORY		PROBLEM SOLVING		CASE		PRACTICE SET		SIMULATION	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
IT IS OF LITTLE HELP	4	16.7	1	3.0	1	2.8	1	3.2	5	22.7	2	6.3	3	12.5
CAN BE HELPFUL	5	20.8	3	9.1	1	2.8	0	.0	3	13.6	1	3.0	1	4.2
IMPORTANT BUT NOT ESSENTIAL	5	20.8	7	21.2	2	5.6	3	9.7	2	9.1	6	18.8	5	20.8
ESSENTIAL	8	33.4	13	39.4	13	36.0	11	35.5	6	27.3	7	21.9	5	20.8
HIGHLY ESSENTIAL	2	8.3	9	27.3	19	52.8	16	51.6	6	27.3	16	50.0	10	41.7
ABSTAINED	16	.0	7	.0	4	.0	9	.0	18	.0	8	.0	16	.0
T O T A L *	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

TABLE 5 (G)  
 FREQUENCY DISTRIBUTION OF THE EFFECTIVENESS OF TEACHING METHODS USED TO TEACH  
 END-OF-PERIOD ADJUSTMENTS

RESPONSE	LECTURE		LECTURE DISCUSSION		LABORATORY		PROBLEM SOLVING		CASE		PRACTICE SET		SIMULATION	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
IT IS OF LITTLE HELP	6	26.2	1	3.0	2	5.9	1	2.9	4	19.0	3	8.4	5	19.2
CAN BE HELPFUL	2	8.6	3	9.1	1	2.9	1	2.9	2	9.5	8	22.2	2	7.7
IMPORTANT BUT NOT ESSENTIAL	3	13.0	7	21.2	1	2.9	1	2.9	5	23.8	7	19.4	2	7.7
ESSENTIAL	7	30.4	12	36.4	8	23.5	11	32.4	5	23.8	14	50.0	5	19.2
HIGHLY ESSENTIAL	5	21.8	10	30.3	22	64.8	20	58.9	5	23.9	4	.0	12	46.2
ABSTAINED	17	.0	7	.0	6	.0	6	.0	19	.0	4	.0	14	.0
T O T A L *	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

ness of various teaching methods used in the first year high school accounting course.

$H_1$  : There is a difference in the effectiveness of various teaching methods used in the first year high school accounting course.

2.  $H_0$  : The relative effectiveness of the teaching method used in the first year high school accounting course does not vary as a function of the topic taught.

$H_1$  : The relative effectiveness of the teaching method used in the first year high school accounting course varies as a function of the topic taught.

3.  $H_0$  : The relative effectiveness of the teaching method used in the first year high school accounting course does not vary as a function of the number of years of experience as an accounting teacher.

$H_1$  : The relative effectiveness of the teaching method used in the first year high school accounting course varies as a function of the number of years of experience as an accounting teacher.

The results of the three-way - Experience X instructional Methodology X Topic ANOVA are presented in Table 6. The results indicated that there was no significant main effect due to experience. There was a significant main effect due to topic and a significant main effect due to method. Also there was a significant main

TABLE 6  
 EXPERIENCE X INSTRUCTIONAL METHODOLOGY  
 X TOPIC ANOVA

SOURCE OF VARIATION	SS	df	MS	F	P
EXPERIENCE	19.28	2	9.64	1.02	.4389
ERROR 1	37.85	4	9.46		
TOPIC	7.15	6	1.19	2.63	.0418
TOPIC X EXPERIENCE	20.82	12	1.74	3.83	.0025
ERROR 2	10.86	24	.45		
METHOD	167.6	6	27.93	5.91	.0007
METHOD X EXPERIENCE	54.54	12	4.54462	.96	.5084
ERROR 3	113.44	24	4.73		
TOPIC X METHOD	16.52	36	.46	1.59	.0294
TOPIC X METHOD X EXPERIENCE	23.70	72	.33	1.14	.2501
ERROR 4	41.51	144	.29		

effect resulting from the interaction of Topic X Method of Instruction X Experience.

To examine the significance of the Topic X Method of Instruction interaction t tests were computed for all possible pairs of the seven methods means for each topic area. To control for the probability of a type 1 error the Tukey (1953) criterion was used with the nominal level of significance set equal to .05. The results are presented in Tables 7 through 14.

The Table 7, shows the effectiveness of the teaching methods used when teaching the accounting equation, analyzing transactions and using accounts. The lecture-discussion, laboratory and problem solving methods were perceived to be more effective than the lecture method of instruction. The use of case, practice set and simulation methods were found to be less effective than the lecture-discussion method. The case, practice set and simulation methods were considered to be less effective than the laboratory method. The practice set and simulation methods were perceived to be less effective than the problem solving method.

The Table 8, illustrates the effectiveness of the teaching methods used when teaching journalizing and posting. The lecture-discussion, laboratory and problem solving methods were perceived to be superior to the lecture method of instruction. The laboratory method was viewed



TABLE 7

MULTIPLE COMPARISONS AMONG INSTRUCTIONAL  
METHODOLOGY MEANS FOR THE TOPICS "ACCOUNTING EQUATION,  
ANALYZING TRANSACTIONS AND USING ACCOUNTS"<sup>a, b</sup>

METHOD	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	
MEAN	2.86	4.14	3.86	3.86	2.71	2.57	2.43	
M <sub>1</sub>	2.86	—	1.28*	1.00*	1.00*	-.15	-.29	-.43
M <sub>2</sub>	4.41	—	—	-.28	-.28	-1.43*	-1.43*	-1.71*
M <sub>3</sub>	3.86	—	—	—	0.00	-1.15*	-1.29*	-1.43*
M <sub>4</sub>	3.86	—	—	—	—	—	-1.29*	-1.43*
M <sub>5</sub>	2.71	—	—	—	—	—	—	-.28
M <sub>6</sub>	2.57	—	—	—	—	—	—	-.08
M <sub>7</sub>	2.43	—	—	—	—	—	—	—

a. M<sub>1</sub>- Lecture; M<sub>2</sub>- Lecture-discussion; M<sub>3</sub>- Laboratory;  
M<sub>4</sub> - Problem solving; M<sub>5</sub>- Case; M<sub>6</sub>- Practice Set;  
M<sub>7</sub>- Simulation.

b. Tukey criterion: if the absolute value of the observed  
difference between the means exceed:

$$: .05 q_{7,144} / \sqrt{2} \times \sqrt{\frac{2 \text{ Error } 3}{7}}$$

$$: 4.17 / \sqrt{2} \times \sqrt{\frac{2 \times .28831}{7}}$$

$$: 2.95 \times \sqrt{.082}$$

$$: 2.95 \times .287$$

$$: .85$$

then the difference between means is said to be statistically significant at  $\alpha = .05$  which will be denoted by an asterisk (\*).

TABLE 8

MULTIPLE COMPARISONS AMONG INSTRUCTIONAL METHODOLOGY  
 MEANS FOR THE TOPICS "JOURNALIZING AND POSTING"<sup>a, b</sup>

METHOD		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>
	MEAN	2.71	3.86	4.71	4.29	2.71	3.00	3.00
M <sub>1</sub>	2.71	—	1.15*	2.00*	1.58*	—	.29	.29
M <sub>2</sub>	3.86	—	—	.86*	.43	-1.71*	-.86*	-.86*
M <sub>3</sub>	4.71	—	—	—	-.42	-2.00*	-1.71*	-1.71*
M <sub>4</sub>	4.29	—	—	—	—	-1.58*	-1.29*	-1.29*
M <sub>5</sub>	2.71	—	—	—	—	—	.29	.29
M <sub>6</sub>	3.00	—	—	—	—	—	0.00	0.00
M <sub>7</sub>	3.00	—	—	—	—	—	—	—

<sup>a, b</sup> See Table 7.

as superior to the lecture-discussion method. The use of case, practice set and simulation methods were considered to be less effective than the lecture-discussion method. The case, practice set and simulation methods were found to be less effective than the laboratory method. Problem solving method was considered to be superior to the case, practice set and the simulation method.

The Table 9, depicts the effectiveness of the teaching methods used when teaching the trial balance, financial statements and closing the ledger. The lecture-discussion, laboratory and problem solving methods were perceived to be more effective than the lecture method. The lecture-discussion method was viewed as more effective than the case and the simulation methods. The laboratory method was considered more effective than practice set and simulation methods. The problem solving method was considered to be superior to the case, practice set and simulation methods.

TABLE 9  
 MULTIPLE COMPARISONS AMONG INSTRUCTIONAL METHODOLOGY  
 MEANS FOR THE TOPICS "TRIAL BALANCE,  
 FINANCIAL STATEMENTS AND CLOSING THE LEDGER"<sup>a, b</sup>

METHOD	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	
MEAN	2.71	3.86	4.57	4.29	3.00	3.43	3.00	
M <sub>1</sub>	2.71	—	1.15*	1.86*	1.58*	.29	.72	.72
M <sub>2</sub>	3.86	—	—	.71	.43	-.86*	-.43	-1.86*
M <sub>3</sub>	4.57	—	—	—	-.29	-1.57*	-1.14*	-1.57*
M <sub>4</sub>	4.29	—	—	—	—	-1.29*	.86*	-1.29*
M <sub>5</sub>	3.00	—	—	—	—	—	.43	0.00
M <sub>6</sub>	3.43	—	—	—	—	—	0.00	-.43
M <sub>7</sub>	3.00	—	—	—	—	—	—	—

<sup>a, b</sup> See Table 7.

The Table 10, presents the effectiveness of the teaching methods used when teaching banking, cash receipts and cash payments journal. The lecture-discussion, laboratory, problem solving, practice set and simulation methods were perceived to be more effective than the lecture method of instruction. The laboratory method was viewed as superior to the case and simulation methods. The problem solving method was considered to be more effective than case, practice set and simulation methods.

The Table 11, illustrates the effectiveness of the teaching methods used when teaching the payroll. The lecture method is perceived to be less effective than the lecture-discussion, laboratory, problem solving methods of instruction. The laboratory method was considered to be more effective than the case, practice set and simulation methods. The problem solving method was viewed as more effective than the case, practice set and simulation methods.

TABLE 10  
 MULTIPLE COMPARISONS AMONG INSTRUCTIONAL METHODOLOGY  
 MEANS FOR THE TOPICS "BANKING, CASH RECEIPTS  
 AND CASH PAYMENTS"<sup>a, b</sup>

METHOD		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>
	MEAN	2.57	3.86	4.57	4.71	3.29	3.86	3.43
M <sub>1</sub>	2.57	—	1.29*	2.00*	2.14*	.72	1.29*	.86
M <sub>2</sub>	3.86	—	—	.71	.85	-.57	—	-.43
M <sub>3</sub>	4.57	—	—	—	.14	-1.29*	-.71	-1.14*
M <sub>4</sub>	4.71	—	—	—	—	-1.42*	-.86*	-1.28*
M <sub>5</sub>	3.29	—	—	—	—	—	.57	.14
M <sub>6</sub>	3.86	—	—	—	—	—	—	.43
M <sub>7</sub>	3.43	—	—	—	—	—	—	—

<sup>a, b</sup>See Table 7

TABLE 11  
 MULTIPLE COMPARISONS AMONG INSTRUCTIONAL  
 METHODOLOGY MEANS FOR THE TOPIC "PAYROLL"<sup>a, b</sup>

METHOD	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	
MEAN	2.71	3.86	4.43	4.71	3.43	3.29	3.29	
M <sub>1</sub>	2.71	—	1.15*	1.72*	2.00*	.72	.58	.48
M <sub>2</sub>	3.86	—	—	.57	.85	-.43	-.57	-.57
M <sub>3</sub>	4.43	—	—	—	.28	-1.00*	-1.14*	-1.14*
M <sub>4</sub>	4.71	—	—	—	—	-1.28*	-1.42*	-1.42*
M <sub>5</sub>	3.43	—	—	—	—	—	-.14	-.14
M <sub>6</sub>	3.29	—	—	—	—	—	—	—
M <sub>7</sub>	3.29	—	—	—	—	—	—	—

<sup>a, b</sup> See Table 7



The Table 12, present the effectiveness of the teaching methods used when teaching the processing of purchases and the sale of merchandise. The lecture-discussion, laboratory, problem solving and practice set methods were perceived to be more effective than the lecture method. The lecture-discussion was considered to be less effective than the problem solving method and the simulation method is less effective than the lecture-discussion method. The laboratory method was believed to be superior to the case and simulation methods. The problem solving method was viewed to be more effective than the case and simulation method. The practice set was considered to be more effective than the simulation method.

The Table 13, shows the effectiveness of the teaching methods used when teaching the end-of-period adjustments. The lecture-discussion, laboratory and problem solving methods were perceived to be more effective than the lecture method. The laboratory and problem solving methods were considered to be more effective than the lecture-discussion method. The case and practice set methods were viewed as less effective than the laboratory method. The problem solving method was considered to be more effective than the case method. The practice set method was perceived to be more effective than the simulation method of instruction.

TABLE 12  
 MULTIPLE COMPARISONS AMONG INSTRUCTIONAL METHODOLOGY  
 MEANS FOR THE TOPICS "PROCESSING OF PURCHASES AND  
 SALE OF MERCHANDISE"<sup>a,b</sup>

METHOD	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	
MEAN	2.57	3.57	4.42	4.57	3.29	3.86	2.71	
M <sub>1</sub>	2.57	—	1.00*	1.85*	2.00*	.72	1.29*	.14
M <sub>2</sub>	3.57	—	—	.85	1.00*	-.28	.29	-.86*
M <sub>3</sub>	4.42	—	—	—	.15	-1.13*	-.56	-1.71*
M <sub>4</sub>	4.57	—	—	—	—	-1.29*	-.71	-1.86*
M <sub>5</sub>	3.29	—	—	—	—	0.00	.57	-.58
M <sub>6</sub>	3.86	—	—	—	—	—	0.00	-1.15*
M <sub>7</sub>	2.71	—	—	—	—	—	—	0.00

<sup>a,b</sup>See Table 7.

TABLE 13  
 MULTIPLE COMPARISONS AMONG INSTRUCTIONAL METHODOLOGY  
 MEANS FOR THE TOPICS "END-OF-PERIOD ADJUSTMENTS"<sup>a,b</sup>

METHOD	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	
MEAN	2.71	3.57	4.57	4.57	3.14	3.71	2.86	
M <sub>1</sub>	2.71	—	.86*	1.86*	1.86*	.43	1.00*	.15
M <sub>2</sub>	3.57	—	—	1.00*	1.00*	-.43	.14	-.71
M <sub>3</sub>	4.57	—	—	—	0.00	-1.43*	-.86*	-1.71*
M <sub>4</sub>	4.57	—	—	—	—	-1.43*	.57	-.28
M <sub>5</sub>	3.14	—	—	—	—	—	0.00	-.86*
M <sub>6</sub>	3.71	—	—	—	—	—	—	0.00
M <sub>7</sub>	2.86	—	—	—	—	—	—	—

<sup>a,b</sup>See Table 7.

INSTRUCTIONAL MATERIALS

The descriptive statistics pertaining to the factor 'Instructional Materials' are presented in Tables 14 through 16. As indicated in Table 14, 46.2 per cent favored the overhead projector to the chalkboard and 33.9 per cent thought both had the same effectiveness. The Table 15, shows that 51.5 per cent of the teachers surveyed used the calculating machines, in every or almost every lesson.

Table 16, indicates that 74.3 per cent of the sample believe that the chalkboard is quite or most effective as an instructional aid. The sample responses show that 82.0 per cent is of the opinion that the overhead projector is quite or most effective. It is revealed from the survey results that 57.9 per cent of accounting teachers surveyed indicated that the duplicating material is quite or most effective. The survey results demonstrate that 40 per cent is of the opinion that charts are quite or most effective. As indicated in the table of results 3.2 per cent believe that films are quite or most effective. The survey results indicate that 47.2 per cent believe that programmed textbooks are quite or most effective. Concerning the teacher's manual, sample responses show that 62.1 per cent believe that the teacher's manual is quite or most effective. As indicated by the survey findings, 12.9 per cent of the sample think that film-

TABLE 14  
FREQUENCY DISTRIBUTION OF PERSONS FAVORING  
OVERHEAD PROJECTOR TO CHALKBOARD

RESPONSE	f	PERCENTAGE ADJUSTED FOR ABSTENTION
FAVOR	18	46.2
DO NOT FAVOR	7	19.9
SAME	12	33.9
ABSTAINED	3	.0
TOTAL	40	100.0

TABLE 15  
 FREQUENCY DISTRIBUTION OF THE FOLLOWING  
 INSTRUCTIONAL AIDS

TYPES OF INSTRUCTIONAL AIDS	USED IN EVERY/ALMOST EVERY LESSON		USED SOMETIMES IN LESSONS		ABSTAINED		TOTAL	
	f	%	f	%	f	%	f	%
WORKBOOK	30	81.1	7	18.9	3	.0	40	100.0
CALCULATING MACHINE	17	51.5	16	48.5	7	.0	40	100.0
TEXTBOOKS	33	86.8	5	13.2	2	.0	40	100.0
NOTES	11	33.3	22	66.7	7	.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

TABLE 16  
 FREQUENCY DISTRIBUTION OF EFFECTIVENESS OF INSTRUCTIONAL AIDS

RESPONSE	CHALKBOARD		OVERHEAD PROJECTOR		DUPLICATING MATERIAL		CHARTS		FILMS		PROGRAMMED TEXTBOOKS		TEACHER'S MANUAL		FILMSTRIPS		VIDEO TELEVISION	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
NOT EFFECTIVE	3	7.8	0	.0	0	.0	7	20.0	14	45.2	4	11.1	3	8.2	13	41.9	21	72.5
SOMEWHAT EFFECTIVE	7	17.9	7	18.0	16	42.1	14	40.0	16	51.6	15	41.7	11	29.7	14	45.2	7	24.1
QUITE EFFECTIVE	16	41.0	13	33.3	17	44.7	12	34.3	1	3.2	10	27.8	16	43.2	1	3.2	1	3.4
MOST EFFECTIVE	13	33.3	19	48.7	5	13.2	2	5.7	0	.0	7	19.4	7	18.9	3	9.7	0	.0
ABSTAINED	1	.0	1	.0	2	.0	5	.0	9	.0	4	.0	3	.0	9	.0	11	.0
TOTAL*	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

strips are quite or most effective.

STATISTICAL HYPOTHESES:

4.  $H_0$  : There is no difference in the effectiveness of various instructional aids used in teaching the first year high school accounting course.

$H_1$  : There is a difference in the effectiveness of various instructional aids used in teaching the first year high school accounting course.

5.  $H_0$  : The relative effectiveness of various instructional aids used in the first year high school accounting course does not vary as a function of the number of years of experience as an accounting teacher.

$H_1$  : The relative effectiveness of various instructional aids used in the first year high school accounting course varies as a function of the number of years of experience as an accounting teacher.

The results of the Experience X Instructional Materials ANOVA are presented in Table 17. Results indicated a significant main effect due to instructional materials. There was no significant difference in experience groups on the overall effectiveness of materials in general, nor was there a significant interaction between years of experience and instructional materials.



TABLE 17

## EXPERIENCE X INSTRUCTIONAL MATERIALS ANOVA

---

SOURCE OF VARIATION	SS	df	MS	F	P
EXPERIENCE	1.20	3	.40	0.57	.6432
ERROR 1	14.06	20	.70		
AID	80.41	8	10.05	15.02	.0000
AID X EXPERIENCE	15.16	24	.63	0.94	.5439
ERROR 2	107.08	160	.67		

---

To examine the significance of the instructional materials main effect, multiple t tests were computed on all the possible pairwise comparisons among the nine materials means. To control for the probability of a type I error, the Tukey criterion was used, with the nominal level of significance set equal to .05. The nine means and the results of the post hoc analysis are presented in Table 18.

The Table 18, illustrates the effectiveness of the instructional aids used in the first year high school accounting course. The chalkboard was perceived to be superior to the films, filmstrips and video television. The overhead projector was considered to be superior to duplicating material, charts films, programmed textbooks, filmstrips, and video television. The duplicating material was viewed as superior to the filmstrips and video television. The charts were perceived to be more effective than the video television. The films were perceived to be less effective than programmed textbooks. The programmed textbooks were viewed as superior to filmstrips and video television. The teacher's manual was perceived to be more effective than the filmstrips and video television.

MULTIPLE COMPARISONS AMONG INSTRUCTIONAL MATERIAL MEANS<sup>a,b</sup>

INSTRUCTIONAL MATERIAL	CB	OP	DM	CH	F	PRT	TM	FS	VTV
MEAN	2.88	3.38	2.58	2.17	1.54	2.58	2.83	1.83	1.38
2.88	—	.50	-.30	-.71	-1.34*	-.30	-.05	-1.05*	-1.05*
3.38	—	—	-.80*	-1.21*	-1.84*	-.80*	-.55	-1.55*	-2.00*
2.58	—	—	—	-.41	-1.04*	0.00	.25	-.75*	-1.20*
2.17	—	—	—	—	-.63	.41	.66	-.34	-.79*
1.54	—	—	—	—	—	1.04*	1.29*	.29	-.16
2.58	—	—	—	—	—	—	.25	-.75*	-1.20*
2.83	—	—	—	—	—	—	—	-1.00*	-1.45*
1.83	—	—	—	—	—	—	—	—	-.45
1.38	—	—	—	—	—	—	—	—	—

CB - Chalkboard; OP - Overhead projector; DM - Duplicating material;

CH - Charts; F - Films; PRT - Programmed textbooks; TM - Teacher's manual;

FS - Filmstrips; VTV - Video-television.

Tukey criterion: if the absolute value of observed difference between any two means exceed:

$$\begin{aligned}
 & .05 \quad q \quad 9,160/\sqrt{2} \times \sqrt{\frac{2 - \text{Error } 2}{24}} \\
 & = 4.39/\sqrt{2} \times \sqrt{.056} \\
 & = 3.10 \times .236 \\
 & = .732
 \end{aligned}$$

then the difference between the two means will be judged statistically significant at  $\alpha = .05$  which will be denoted by an asterisk (\*).

LEARNING PRINCIPLES

The descriptive statistics pertaining to the factor 'Learning Principles' are presented in Table 19. As presented in the aforementioned Table, 83.4 per cent of the sample think that active participation is essential or highly essential for instructional efficiency. Sample responses indicate that 69.5 per cent is of the opinion that reinforcement is essential or highly essential. As may be observed in the table of results, 45.8 per cent believe that the principle of discovery is essential or highly essential. The survey results indicate that 47.2 per cent believe that meaningfulness is essential or highly essential. As indicated by the teachers surveyed, 62.2 per cent of the sample believe that sequence is essential or highly essential. Results of the survey indicate that 58.8 per cent of the sample is of the opinion that motivation is essential or highly essential for instructional efficiency. The perceptions of the accounting teachers surveyed indicate that 61.2 per cent of the sample believe that transfer of knowledge is essential or highly essential in the learning process.

STATISTICAL HYPOTHESES:

6.  $H_0$  : There is no difference in the relative importance of various principles of learning used in teaching the first year high school accounting course.

TABLE 19  
FREQUENCY DISTRIBUTION OF THE LEARNING PRINCIPLES USED

LEARNING PRINCIPLES	HIGHLY ESSENTIAL		ESSENTIAL		IMPORTANT BUT NOT ESSENTIAL		CAN BE HELPFUL		OF LITTLE HELP		ABSTAINED		TOTAL	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
ACTIVE PARTICIPATION	28	77.8	2	5.6	2	5.6	0	.0	4	11.1	4	.0	40	100.0
REINFORCEMENT	15	41.7	10	27.8	3	8.3	4	11.1	4	11.1	4	.0	40	100.0
DISCOVERY	3	12.5	8	33.3	3	12.5	6	25.0	4	16.7	16	.0	40	100.0
MEANINGFULNESS	5	13.9	12	33.3	13	36.1	4	11.1	2	5.6	4	.0	40	100.0
SEQUENCE	14	37.9	9	24.3	2	5.4	5	13.5	7	18.9	3	.0	40	100.0
MOTIVATION	13	38.2	7	20.6	8	23.5	2	5.9	4	11.8	6	.0	40	100.0
TRANSFER	8	22.9	12	38.3	6	13.2	5	14.2	4	11.4	5	.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

$H_1$  : There is a difference in the relative importance of various principles of learning used in teaching the first year high school accounting course.

7.  $H_0$  : The relative importance of learning principles used in the first year high school accounting course does not vary as a function of the teaching method used.

$H_1$  : The relative importance of learning principles used in the first year high school accounting course varies as a function of the teaching method used.

8.  $H_0$  : The relative importance of the learning principles used in the first year high school accounting course does not vary as a function of the number of years of experience as an accounting teacher.

$H_1$  : The relative importance of the learning principles used in the first year high school accounting course varies as a function of the number of years of experience as an accounting teacher.

The results of the Experience X Learning Principles ANOVA are presented in Table 20. The results show a significant difference on the overall effectiveness of learning principles resulting from the number of years of experience as an accounting teacher. To examine the significance of the learning principles main effect, multiple t tests were computed on all possible pairwise comparisons

TABLE 20

## TEACHING EXPERIENCE X LEARNING PRINCIPLES ANOVA

SOURCE OF VARIATION	SS	df	MS	F	P
EXPERIENCE	9.85	3	3.28	.49	.6907
ERROR 1	132.99	20	6.65		
LEARNING	31.28	6	5.21	4.19	.0007
LEARNING & EXPERIENCE	32.12	18	1.78	1.43	.1275
ERROR 2	149.22	120	1.24		

of the seven learning principles means. To control for the probability of a type 1 error, the Tukey criterion was used, with the nominal level of significance set equal to .05. These results are presented in Table 21.

The Table 21, presents the relative effectiveness of the principles of learning used in the first year high school accounting course. The principle of active participation is perceived to be more effective than reinforcement, discovery and motivation. The principle of motivation, sequence, and transfer were believed to be more effective than the principle of discovery.

#### CURRENT PEDAGOGICAL ISSUES

As illustrated in Table 22, 33.3 per cent agree or strongly agree that accounting course should be more computer oriented and 64.1 per cent disagree or strongly disagree. The sample surveyed indicated that 73.7 per cent agree or strongly agree that accounting students be permitted to use pencils instead of pens and 26.3 per cent disagree or strongly disagree. Concerning field trips, 25.6 per cent agree or strongly agree that they are a waste of time; 35.9 per cent disagree and 38.5 per cent has expressed no opinion. Response to the question whether practice set be discouraged, indicated that 5.1 per cent of the sample agree or strongly agree, while 82 per cent disagree or strongly disagree. With respect to



TABLE 21

## MULTIPLE COMPARISONS AMONG THE 'LEARNING PRINCIPLES'

MEANS<sup>a,b</sup>

LEARNING PRINCIPLES	MEAN	AP	R	D	M	S	MO	T
		3.21	1.96	1.50	2.50	2.50	2.17	2.54
AP	3.21	—	1.25*	1.71*	-.71	-.71	-1.04*	-.67
R	1.96	—	—	-.46	.54	.54	.21	.58
D	1.50	—	—	—	1.00*	1.00*	.67	1.04*
M	2.50	—	—	—	—	—	-.33	.04
S	2.50	—	—	—	—	—	—	.37
MO	2.17	—	—	—	—	—	—	.37
T	2.54	—	—	—	—	—	—	—

a. AP - Active participation; R - Reinforcement; D - Discovery; M - Meaningfulness; S - Sequence; Mo - Motivation; T - Transfer.

b. Tukey criterion: if the absolute value of observed difference between any two means exceed:

$$\begin{aligned}
 & .05 \alpha \quad 7,120 / \sqrt{2} \times \sqrt{\frac{2 \text{ Error}}{4}} \\
 & = 4.24 / \sqrt{2} \times \sqrt{\frac{2 \times 1.24}{24}} \\
 & = 3.00 \times \sqrt{.103} \\
 & = 3.00 \times .321 \\
 & = .963.
 \end{aligned}$$

then the difference between the two means will be judged statistically significant at  $\alpha = .05$  which will be denoted by an asterisk (\*).

TABLE 22

## FREQUENCY DISTRIBUTION OF SUMMARY STATEMENTS CONCERNING FIRST YEAR HIGH SCHOOL ACCOUNTING

STATEMENT SUMMARY	STRONGLY AGREE		AGREE		NO OPINION		DISAGREE		STRONGLY DISAGREE		ABSTAINED		TOTAL	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Accounting course should be more computer oriented.	2	5.1	11	28.2	1	2.6	20	51.3	5	12.8	1	.0	40	100.0
Accounting students may be permitted to use pencils instead of pens.	12	31.6	16	42.1	0	.0	4	10.5	6	15.8	2	.0	40	100.0
Field trips are a waste of time.	3	7.7	7	17.9	15	38.5	14	35.9	0	.0	1	.0	40	100.0
The use of accounting practice sets should be discouraged.	0	.0	2	5.1	5	12.8	16	41.0	16	41.0	1	.0	40	100.0
Vocational objective should be a high priority in the accounting course.	6	15.4	7	17.9	1	2.6	17	43.6	8	20.5	1	.0	40	100.0
The accounting teacher must cover the entire course content irrespective of students' mastery.	1	2.6	4	10.3	6	15.4	14	35.9	14	35.0	1	.0	40	100.0

\* PERCENTAGES ADJUSTED FOR ABSTENTION

the question whether the vocational objective should be given high priority in the first year high school accounting course, 33.3 per cent of the sample agree or strongly agree and 64.1 per cent disagree or strongly disagree. Concerning the question whether the accounting teacher should cover the entire course content irrespective of students' mastery; 12.9 per cent of the sample agree or strongly agree, while 71.8 per cent disagree or strongly disagree.

CHAPTER V  
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

PURPOSE

The primary purpose of this study was to determine the business teacher perceptions concerning the effectiveness of instructional methods, materials and learning principles used in the first year high school accounting course. It is believed that a study of this nature will not only fill the existing void in the development of instructional procedures in high school accounting; but, endeavours to meet the needs of both professional staff and students.

The instructional methods, organizational patterns and the diverse needs of students have reflected a strong desire to develop more effective techniques. This study is an attempt to evaluate objectives, curricula and instructional procedures on the basis of research so that the accounting teachers could meet the present and the projected needs of the students.

INSTRUMENTATION AND DATA COLLECTION

A questionnaire was developed to collect data, and it included questions pertaining to teaching experience and qualifications; teaching materials and media; learning principles; current pedagogical concerns and teaching methods.

This questionnaire was administered to a sample of 50 first year high school accounting teachers in the province of Manitoba. The numerical size of the population was 160. The sample was selected by the use of random numbers. The questionnaire also provided space for any comments and concerns with respect to the teaching of accounting 202, that the teacher would like to share with the writer.

A list of names and addresses of those teachers who were teaching the first year high school accounting course was obtained from the Department of Education in Manitoba.

The questionnaire was mailed to the teachers in early June 1979 and 80 per cent of the questionnaires were returned. The descriptive statistics illustrated in Chapter IV, by means of tables were processed on the computer.

ANALYSES OF DATA

The data collected by the questionnaire was tabulated to illustrate the frequency distribution in terms of the respective questions posed, which structure the problem of this study.

1. The analysis of variance was used to determine whether there was a significant interaction between years of experience and instructional aids.

2. To examine the significance of the aids' main effect, multiple t tests were computed. To control for the probability of a type I error, the Tukey (1953) criterion was used, with the nominal level of significance set to .05.

3. To examine the significance of the learning principles' main effect, multiple t tests were computed.

4. To examine the significance of the instructional methods' main effect, when teaching accounting equation, analyzing transaction and using accounts, multiple t tests were computed.

5. To examine the significance of the instructional methods' main effect when teaching journalizing and posting, multiple t tests were computed.

6. To examine the significance of the instructional methods' main effect when teaching the trial balance, financial statements and closing the ledger, multiple t tests were computed.

7. To examine the significance of the instructional methods' main effect when teaching banking, cash receipts and payments journal, multiple t tests were computed.

8. To examine the significance of the instructional methods' main effect when teaching payroll, multiple t tests were computed.

9. To examine the significance of the instructional methods' main effect when teaching processing of purchases and sale of merchandise, multiple t tests were computed.

10. To examine the significance of the instructional methods' main effect when teaching the end-of-period adjustments, multiple t tests were computed.

SUMMARY OF RESULTS

1. Teachers surveyed indicated that 61.5 per cent has the first or the second degree.
2. The overhead projector is superior to the chalkboard as an instructional aid.
3. The lecture-discussion method is superior to the laboratory method.
4. The contribution made by the duplicating material as an instructional aid is not significant.
5. The combined aid of the overhead projector and the chalkboard is superior to other aids.
6. Charts can be very effective if students are expected to learn through sight.
7. Active participation of the student is essential for learning.
8. The teacher should reinforce the learner with positive reinforcement.
9. Discovered concepts relate to new situations much better than knowledge received through reception learning.
10. Subject matter should be presented according to a sequence - from the simple to the complex.
11. For learning to take place the student should be motivated.
12. Students must be taught in such a way that they can transfer knowledge.



13. Survey indicated that the following methods were the most effective when teaching the first year high school accounting: lecture-discussion; laboratory; problem solving; practice set and lecture.

## CONCLUSIONS

1. The results of the investigation revealed that about 61.5 per cent of the teachers who teach the first year high school accounting course in the province of Manitoba possess the first degree.

2. The business teachers surveyed indicated that they perceive the overhead projector to be more effective than the chalkboard when teaching the first year high school accounting.

3. It was the opinion of most of the business teachers surveyed that lecture-discussion method is superior to the laboratory method of instruction.

4. This study has found that the combined aid of the overhead projector and the chalkboard is more effective than the combined aid of all the other instructional aids.

5. Learning through sight being so important to the learner, charts can be a useful instructional aid particularly when presenting the accounting equation and the rules of debit and credit.

6. It is the opinion of about 50 per cent of the sample of business teachers surveyed that, films are not effective as instructional aids.

7. Programmed textbooks can be used very effectively when individualizing instruction in elementary ac-

counting courses.

8. Teacher's manual can be an excellent aid in the planning of lessons and presenting material from the textbook.

9. Filmstrips can prove to be an effective instructional aid, especially when reviewing the accounting cycle.

10. It is likely that the less motivated student will not benefit by the use of video television in the accounting classroom, as the scope for active student participation in the learning process is minimal.

11. It is the opinion of most teachers surveyed that the students should be encouraged to use calculating machines in the accounting classes.

12. Survey results indicated that 77.8 per cent of the sample believes that active participation in the learning process by the learner, is highly essential for instructional efficiency. This can be achieved by the lecture-discussion or the problem solving method.

13. There is no conclusive evidence to indicate that punishment produces better learning than under the receipt of a reward. Therefore, the accounting teacher should reinforce the learner with positive reinforcement.

14. The sample surveyed has placed a low emphasis on the principle of discovery. Only 12.5 per cent think it is highly essential. However, Bruner points out that

when discovery learning is utilized motivation tends to shift from the extrinsic to intrinsic rewards because discovery is very rewarding to the student.

15. Active participation is a pre-requisite for discovery learning. Experimental studies have found that discovered concepts transfer to new situations better than the concepts learned through reception learning. This principle can be effectively utilized by the laboratory or case method of instruction.

16. It is evident from the frequency distribution of the sample that 47.2 per cent believe that meaningfulness of the material is highly essential for instructional efficiency. Meaningfulness can be achieved by teaching the why and how aspects of accounting procedures.

17. It is generally believed by learning theorists that meaningful materials can transfer to other learning situations more readily than the material learned by rote memorization.

18. There is a strong belief among business teachers that a proper sequence in the presentation of learning material must be followed for effective learning to take place. The basic material must be covered before attempting to cover more advanced material. It has been found that students learn best when they proceed from the simple to the complex and from the known to the unknown. Sample responses indicate that 62.2 per cent believe

that proper sequence is essential or highly essential for effective instruction.

19. All learning theorists have emphasized the need for motivation in the learning process. Without motivation there can be no learning. The principle of motivation can be utilized by showing the students the usefulness of the course and eventually the students will want to learn the material. Active participation in the learning situation and discovery learning will provide greater intrinsic motivation to the students.

20. Learning will have little value, if what is learnt cannot be transferred to new situations. Most of the accounting application is problem solving, and the transfer of the method of problem solving is more important than the mere transfer of principles and accounting procedures. Case studies, business games and problem solving methods of instruction emphasize this principle of transfer.

21. It is the opinion of most of the business teachers surveyed that the following learning principles viz., active participation, reinforcement, sequence, motivation and transfer when integrated with the appropriate teaching method will enhance instructional efficiency - this being a function of learning time.

22. For most of the students, first year high school accounting course can be the terminal education in

bookkeeping and accounting. Therefore, it seems imperative that they be given some insight into the role of automation in the business offices. This should encompass the basic understanding of what certain data processing equipment will do and what the underlying process and systems are.

23. The use of pencils will help the students to correct their errors more neatly than when they use the pen. This will enable them to acquire a better mental picture of the accounting procedures.

24. Field trips can be a valuable learning experience, provided that students are appraised of what they are to observe. They must be required to submit an individual or group report of the trip. This will make the field trip more meaningful and rewarding.

25. The use of practice set integrates all the principles and procedures covered into one learning situation. It provides the opportunity for students to pull the sequence of bookkeeping together in a unifying manner and to see the entire bookkeeping and accounting cycle. It can be concluded that the use of practice set should be encouraged and it is a very effective instrument of learning.

26. There are certain limitations of the high school introductory accounting course as vocational preparation. Many of our first year high school accounting students do not select a second accounting course. Fewer

and fewer job openings exist for the grade 12 graduates in the accounting field. The computer has eliminated many jobs in the area of data manipulation. As indicated in the survey, 64.1 per cent of the sample is against the emphasis of the vocational objective in the first year high school accounting course. It is therefore believed that there should be less emphasis on vocational goals and greater awareness of the need for problem solving skills, communication skills and positive personal and social attitudes.

27. It is evident from the survey results that the accounting teacher should not be too content oriented. Often the accounting course content is a list of sequential topics presented by a textbook and there is no provision in terms of complexity of material used to help the lower ability group in the class. It is important to recognize the individual needs and the accounting teachers should go slow with the lower ability students but they must be able to achieve the broader objectives in order to pass the course. Activities leading to problem solving and critical thinking must be encouraged. It is the opinion of 71.8 per cent of the sample surveyed that the entire course content need not be covered, if the students are not ready for it.

28. The accounting educators need to recognize the fact that the students' early education has been on a high-

ly individualized basis. Active participation by the learner in the learning situation is highly essential to utilize other related principles of learning. Therefore, use of large classes in accounting instruction will prevent the utilization of active participation and student involvement in the learning situation. This will also minimize the scope for individualized instruction.

29. The review of the survey responses concerning the broad instructional methods used to teach different topics indicate that lecture-discussion, laboratory, problem solving, practice set and lecture are some of the most effective methods used when teaching the first year high school accounting curriculum.



## RECOMMENDATIONS

1. Since it is evident from the survey results that there is a difference in the effectiveness of various instructional methods used in the first year high school accounting classes, it is imperative that selection of such teaching methods be consistent with the topic taught.
2. The three instructional methods that can be utilized very effectively in teaching most of the topics in the accounting curriculum are the lecture-discussion, laboratory and problem solving method.
3. Greater emphasis must be placed in the development of problem solving skills and critical thinking among students which will equip them with the knowledge required to meet the needs of a rapidly changing market economy.
4. Accounting educators should endeavour to integrate the instructional methodology with the appropriate learning principles to achieve optimum instructional efficiency.
5. Active student participation in the learning situation is essential to make the learning meaningful and rewarding. The use of large classes will prevent the active participation and student involvement in the learning situation.
6. An attempt must be made to present to the students those accounting practices and procedures that are

currently being used but not reflected in the accounting textbooks used.

7. The accounting course content should recognize the needs of the slow learners and the under achievers. Hence, provisions must be made in terms of complexity of the material and study guides to help the lower ability students.

8. Concerted effort must be made to make the accounting procedures as meaningful as possible. This can be achieved by teaching not only the how aspect but the why aspect of accounting principles.

9. An effort to ascertain the effectiveness of various instructional aids used in accounting classes will generate greater efficiency in the instructional process - efficiency being a function of learning time.

10. Textbook is one of the very useful aids in accounting classes, but it is imperative that the textbook writers ensure that they recognize the need to use the language appropriate to the grade level in the accounting course.

11. It is suggested that an experimental study be undertaken to determine the effectiveness of the instructional methods, materials and learning principles used in the high school advance accounting course.

12. A follow-up study should be made of students to determine the uses being made of the knowledge of

elementary accounting acquired and any changes in emphasis which should be made in the course content.

13. A study should be made of those students who drop or who fail the first year high school accounting course, to determine possible weaknesses in teaching, as well as identifiable student characteristics.

APPENDIX

QUESTIONNAIRE

This questionnaire is part of a study that is being conducted to determine the business teacher perceptions of effectiveness in the teaching of the first year high school accounting course in Manitoba - Accounting 202. If you have any additional comments about the teaching of accounting 202, space is provided on the reverse side of page 3 of the questionnaire for these comments.

INSTRUCTION

The validity of the data collected in this survey will depend on your diligence in answering the questions.

You need not disclose your identity. Your name will not be used in the tabulation of data collected in this questionnaire.

It will be very much appreciated, if you will kindly return this questionnaire before May 31.

Please use independent judgement when answering the following questions.

1. Years of teaching experience in the profession to June 30, 1979:  
 1 - 2 yrs;     3 - 5 yrs;     6 - 9 yrs;     10 or more yrs;
2. Years of experience as an accounting teacher to June 30, 1979:  
 1 - 2 yrs;     3 - 5 yrs;     6 - 9 yrs;     10 or more yrs;
3. Your professional qualifications:  
 Bus. Ed. Certificate     B. Ped.     Pre-Masters completed;  
 B. Ed. (New)     B. Ed. (Old)     Other: (please specify)  
     (4 yr. course)    (Second degree)     M. Ed.    \_\_\_\_\_
4. In your opinion, is the overhead projector superior to the chalkboard as a visual aid in teaching first year high school accounting?  yes     no     same  
 Comment? \_\_\_\_\_
5. Is the lecture-discussion method of instruction superior to the laboratory method at the introductory stage of a lesson, in the first year high school accounting course?  
 yes     no     same  
 Comment? \_\_\_\_\_
6. Which instructional aids are most effective for use in teaching first year accounting?  
 Please indicate by placing an X in the appropriate space.

<u>Instructional aid</u>	<u>Not Effective</u>	<u>Somewhat Effective</u>	<u>Quite Effective</u>	<u>Most Effective</u>
Chalkboard	_____	_____	_____	_____
Overhead projector	_____	_____	_____	_____
Duplicating material	_____	_____	_____	_____
Charts	_____	_____	_____	_____
Films	_____	_____	_____	_____
Programmed textbooks	_____	_____	_____	_____
Teacher's manual	_____	_____	_____	_____
Film strips	_____	_____	_____	_____
Video-television	_____	_____	_____	_____

7. Place TWO check marks, if you provide the following learning aids for every or almost every lesson you teach but only ONE check mark if you use these aids sometimes.

\_\_\_\_\_ workbook      \_\_\_\_\_ calculating machine      \_\_\_\_\_ textbook      \_\_\_\_\_ notes

8. Below is a list of common principles of learning for high school accounting. Please rank 1 - 5 (1 is highest) in the space provided, to indicate the learning principles that you find most effective in your accounting class(s).

\_\_\_\_\_ Principle of ACTIVE PARTICIPATION: the learner should be actively involved in the learning situation.

\_\_\_\_\_ Principle of REINFORCEMENT: the learner should be reinforced in the learning situation.

\_\_\_\_\_ Principle of DISCOVERY: the learner should discover relationships and principles himself, rather than having these relationships and principles demonstrated to him.

\_\_\_\_\_ Principle of MEANINGFULNESS: the material should be as meaningful as possible in nature and be readily internalized into the cognitive structure of the learner.

\_\_\_\_\_ Principle of SEQUENCE: the material should be organized in such a way as to move logically to the end goal, and that should be clearly in sight.

\_\_\_\_\_ Principle of MOTIVATION: the learner must be motivated to learn. This should be intrinsic, positive motivation whenever possible.

\_\_\_\_\_ Principle of TRANSFER: the material should be taught in such a way as to facilitate proper transfer to other situations.

9. Read each statement carefully and decide to what extent you agree or disagree with it. Then state your opinion by CIRCLING one number in the column marked "Strongly Agree", "Agree", "No Opinion", "Disagree", or "Strongly Disagree".

<u>Circle one number for each statement:</u>	<u>Strongly Agree</u>	<u>Agree</u>	<u>No Opinion</u>	<u>Disagree</u>	<u>Strongly Disagree</u>
The first year high school accounting course should be more computer-oriented, to meet current occupational needs.	1	2	3	4	5
At the accounting teacher's discretion, first year accounting students could be permitted to use pencils instead of pens.	1	2	3	4	5
Field trips in high school accounting classes are a waste of time, because, often students perceive these as pleasure trips.	1	2	3	4	5
Accounting teachers should be discouraged from using accounting practice sets because: (a) students copy from each other; (b) the excessive time taken to complete these sets.	1	2	3	4	5
The accounting teacher must teach the elementary high school accounting course as if every student has planned a career in accounting.	1	2	3	4	5
Whether students can master it or not, the accounting teacher must cover the entire accounting course content.	1	2	3	4	5

10. In your opinion, which five teaching methods are most effective when teaching the following topics in the first year high school accounting course? Using the scale given below, CIRCLE the appropriate number under each teaching method.  
 Note: select only five teaching methods for each topic. Refer to the definition of terms given below.

1. It is of little help
2. Can be helpful
3. Important but not essential
4. Essential
5. Highly essential

Topic	T E A C H I N G M E T H O D						
	1. Lecture	2. Lecture discussion	3. Laboratory	4. Problem solving	5. Case	6. Practice set	7. Simulation
Accounting equation, Analyzing transactions & Using Accounts	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Journalizing and Posting	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Trial Balance, Financial Statements & Closing ledger	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Banking, Cash Receipts & Payments Journal	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Payroll	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Processing of Purchases & Sale of Merchandise	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
End-of-Period Adjustments	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Definition of Terms

1. Lecture: It usually implies little or no class participation. Instructor gives an oral presentation.
2. Lecture-discussion: Oral presentation of facts by instructor along with active student participation in discussion.
3. Laboratory: It is a supervised period of work and instruction supplementary to the preliminary learning.
4. Problem solving: With the help of a visual aid the teacher will demonstrate, step by step working of the problem.
5. Case: Student discovers relationships and concepts for himself leading to higher degree of student participation.
6. Practice set: It integrates all the principles and procedures covered, into one learning situation.
7. Simulation: Students are assigned tasks that are similar to real working situations.

198 Carlotta Crescent  
Winnipeg, Manitoba  
R3R 2K4

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May 21, 1979

Dear Accounting Teacher:

I am a business education teacher who is conducting research into "The Effectiveness of Teaching the First Year High School Accounting Course as Perceived by the Business Education Teachers in Manitoba". This study is undertaken under the direction of Dr. A. M. McPherson and Dr. H. J. Porozny, in the Faculty of Education at the University of Manitoba.

It is my firm conviction that a good source of information for such a study is the accounting teacher his/herself; therefore, I have prepared a questionnaire for you to answer. Thus, may I please take a few minutes of your time and ask you to answer the enclosed questionnaire.

The purpose of this study is to assemble and interpret a comprehensive selection of opinions of accounting teachers and other leaders in the field of accounting education. This study will assist those responsible for future revision and improvement of their courses and curriculum by providing information as to what others are thinking about accounting instructional methodology at the elementary level.

I also wish to add that your questionnaire will be identified by number only, never by name. If you would like to receive a summary of this survey or if you would like a copy of the questionnaire, please do not hesitate to make your request known.

If you have any additional comments about the teaching of accounting 202 in the High School, I would like you to share them with me. Space is provided on the reverse side of page 3 of the questionnaire for these comments.

I shall greatly appreciate your answering this questionnaire, for I am anxious to see your opinions included in this study. I am enclosing a stamped self-addressed envelope for your convenience. Please return this questionnaire on or before May 31, 1979.

Your professional assistance is deeply appreciated.

Yours very truly,

Blaise Fernando

Enclosure

# \_\_\_\_\_



198 Carlotta Crescent  
Winnipeg, Manitoba R3R 2K4

June 5, 1979

Dear Accounting Teacher:

On May 21, 1979 I mailed questionnaires to you and other accounting teachers who are teaching accounting 202. The information that I receive from these questionnaires will help me to determine the business teacher perceptions of effectiveness in teaching accounting 202 in Manitoba.

I am happy to say that there has been a gratifying response to my inquiry. To date, more than sixty percent of the recipients have returned the questionnaire; however, I have not yet received your reply. If per chance you have misplaced my questionnaire, I am enclosing a second copy with a self-addressed envelope for your convenience.

Again I wish to stress that your reply will be treated as confidential, and your questionnaire will only be identified by number never by name.

I shall greatly appreciate your answering the questionnaire for I am anxious to see your opinions included in this study. An early reply will be very much appreciated.

Yours very truly,

Blaise Fernando

Enclosure

# \_\_\_\_\_

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