

A VIDEO-TUTORIAL APPROACH TO THE
TEACHING OF ACCOUNTING

by

Betty Rakes Bowman

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APPROVED:

Jeffrey R. Stewart, Chairman

Lawrence H. Cross

Walter L. Shell

Larry N. Killough

David M. Moore

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Blacksburg, Virginia

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TABLE OF CONTENTS

| | Page |
|---|------|
| LIST OF TABLES | v |
| LIST OF FIGURES | vi |
| Chapter | |
| 1. THE PROBLEM | 1 |
| STATEMENT OF THE PROBLEM | 5 |
| PURPOSE OF THE STUDY | 6 |
| HYPOTHESES | 6 |
| DEFINITION OF TERMS | 7 |
| DELIMITATIONS OF THE STUDY | 8 |
| NEED FOR THE STUDY | 9 |
| 2. REVIEW OF RELATED LITERATURE | 12 |
| DEVELOPMENT OF LEARNING MATERIALS | 12 |
| AUDIO-VISUAL STRATEGIES IN BUSINESS EDUCATION | 20 |
| AUDIO-VISUAL STRATEGIES IN ACCOUNTING | 23 |
| SUMMARY | 29 |
| 3. PROCEDURES | 32 |
| DEVELOPMENTAL STAGE | 32 |
| VALIDATION STAGE | 41 |
| Implementation of the Strategy | 41 |
| Evaluation of the Strategy | 46 |
| SUMMARY | 55 |

| Chapter | Page |
|--|------|
| 4. ANALYSIS OF THE VALIDATION DATA | 57 |
| FINDINGS OF THE PRIMARY ANALYSIS | 58 |
| Degree of Equality between the Groups | 58 |
| Statistical Analysis of the Criterion Achievement Test | 62 |
| FINDINGS OF THE SECONDARY ANALYSIS | 69 |
| Comparison of Achievement Scores by Ability Groups and Teachers | 70 |
| 5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS | 77 |
| SUMMARY | 77 |
| Developmental Stage | 77 |
| Validation Stage | 78 |
| CONCLUSIONS | 81 |
| RECOMMENDATIONS | 82 |
| Implications | 83 |
| Discussion | 85 |
| BIBLIOGRAPHY | 86 |
| APPENDIXES | 92 |
| A. Instructional Manual | 92 |
| B. Sample Script | 108 |
| C. Criterion-Referenced Achievement Test | 113 |
| D. Data for Experimental Group | 119 |
| E. Data for Control Group | 122 |

LIST OF TABLES

| Table | Page |
|---|------|
| 1. Comparison of the Experimental and Control Groups on Vocabulary Ability as Measured by the Vocabulary Subtest of the AICPA Orientation Test, Form D | 60 |
| 2. Comparison of the Experimental and Control Groups on Reading Comprehension as Measured by the Reading Comprehension Subtest of the AICPA Orientation Test, Form D | 61 |
| 3. Comparison of the Experimental and Control Groups on Quantitative Ability as Measured by the Quantitative Ability Subtest of the AICPA Orientation Test, Form D | 63 |
| 4. Comparison of the Experimental Group and the Control Group Mean Scores and Standard Deviations on the AICPA Orientation Test Subtests and the Achievement Test | 66 |
| 5. Test of Equality of Regression of the AICPA Orientation Test Subtest Scores and the Achievement Test Scores. | 67 |
| 6. Analysis of Covariance on Achievement Test Scores of the Experimental Group and the Control Group with Vocabulary Ability, Reading Comprehension, and Quantitative Ability as Covariates | 68 |
| 7. Comparison of the AICPA Orientation Test Scores and the Achievement Test Scores of the Five Class Sections | 71 |
| 8. Comparison of Achievement Scores According to Ability Groups | 72 |

LIST OF FIGURES

| Figure | Page |
|--|------|
| 1. Picture of the Set with the Teacher Taken from the Television Monitor | 38 |
| 2. Picture of a Visual Taken from the Television Monitor | 39 |
| 3. Picture of a Table with Headsets and a Monitor-Player Unit | 44 |
| 4. Comparison of Achievement Scores According to Ability Groups - Experimental Group I and Control Groups I and II | 74 |
| 5. Comparison of Achievement Scores According to Ability Groups - Experimental Group I and Control Group I | 75 |
| 6. Comparison of Achievement Scores According to Ability Groups - Experimental Group I and Control Group II | 76 |
| 7. Proposed Video-Tutorial Accounting Lab | 84 |

CHAPTER 1

THE PROBLEM

Educators have the responsibility of continuously evaluating existing methods of instruction while striving to develop new, innovative ones in an effort to improve student achievement.

Professional literature indicates that individualized instruction will be used to a greater extent in the future. However, very little is actually known about the implementation of individualized instruction in business education.¹ Lewis E. Wall states in the Business Education Forum:

. . . For decades we have known that students differ in learning capability; for decades the lecture-demonstration method has prevailed. Today's prospective bookkeeping teachers are being exhorted, as were their professors, to make allowances for individual differences. But improvements are difficult to make and will not be made unless experimentation and innovation make it possible for us to become committed to change.²

Schultheis points out that business educators have not lagged in the implementation of new learning modes, that the problem lies in testing and evaluation.³

¹Lewis E. Wall, "Focus on the Bookkeeping and Accounting Program," Business Education Forum, 26:11, December, 1971.

²Ibid., p. 11.

³Robert A. Schultheis, "Research Priorities for Business Education," The Delta Pi Epsilon Journal, 13:14, February, 1971.

. . . Very little systematic, careful research is being conducted in an effort to determine the effectiveness of the IPI [individually prescribed instruction] and group modes of instruction. Without carefully collected and analyzed data on the effectiveness of these modes, refinement and improvement in their application cannot reasonably be made. Without careful study of these modes, we may be substituting one partially successful system for another, with no gain in the achievement or progress of students.⁴

Accounting instruction should be designed to meet the needs of students with varied objectives and learning capabilities. This is particularly true in community colleges where the students have many different types of career and general education goals.⁵ Research indicates that the academic ability of two-year college students is lower than that of four-year students.⁶

Simon, in describing the comprehensive, two-year community or junior colleges, relates the constant challenge to the faculty and administration alike to fulfill the needs of the wide cross section of students who are ". . . thrust together in a common environment of learning."⁷ He summarizes the challenge by stating:

⁴Ibid., p. 14.

⁵Dennis Gordon and others, "Report of the Committee on the Junior (Community) College Curriculum," The Accounting Review, Supplement to Vol. XLVIII, 1973, p. 48.

⁶K. Patricia Cross, "Occupationally Oriented Students" (prepared for a two-day conference jointly sponsored by the American Educational Publishers Institute and the American Association of Junior Colleges on Occupational-Oriented Programs in Two-Year Colleges, in Miami, Florida, December 5, 1969.)

⁷Sidney J. Simon, "Trends in Bookkeeping and Accounting Instruction in Junior Colleges and Two-Year Community Colleges," Eastern Business Teachers Association Yearbook, 40:288, 1967.

. . . the task of trying to reach effectively all levels of student ability and objectivity remains a formidable one indeed.

In the balance, we cannot audit and then make statements about accounting in community colleges by merely debiting Allowance for Exceptions; certain adjusting entries are required to insure the proper credit.⁸

If the open-door admissions philosophy is accepted, a challenge is therefore evident to utilize the most effective methods of instruction available. According to Patricia Cross, we are no longer concerned with whether students are ready for higher education, but rather with whether higher education is ready for them.⁹

Failure and withdrawal rates in the first year of college accounting appear to focus on the need to improve methods of instruction. Innovative ideas and teaching techniques are revealed widely in recent publications, although reliable research is rarely cited. Anita I. Tyra is quoted in The Accounting Review by a committee of the American Accounting Association in support of this concern. Professor Tyra points out that community college teachers participate in innovative programs but rely on personal impressions to determine their effectiveness.

Many studies in teaching innovations do not meet the methodological requirements of research. In general, accounting teachers at the community college level draw personal conclusions to evaluate the effectiveness of their teaching.¹⁰

⁸Simon, op. cit., p. 288.

⁹Cross, op. cit.

¹⁰Gordon, op. cit., p. 48.

Since it has been concluded that students learn at different rates, individualized instruction is advocated by many community college educators as an important resource to the community college philosophy and commitment.¹¹ Developments in technology now afford the opportunity for teachers to prepare, either individually or collectively, audio-visual materials that are durable and manageable for student use. The television media would appear to offer new horizons in accounting instruction, since it is a discipline that requires illustrations and has been found to be difficult to get across to students in the usual lecture type of presentation.¹²

Based on his research, McCormick states that video tape is the outstanding innovation in recent years in the field of instruction. Video tape makes it possible to rerun the identical quality of instruction for subsequent sections, for review, and for make-up.¹³

Schramm concludes that instructional television has had some remarkable successes; however, these have been insignificant in view of its potential. In order for this potential to be realized, teachers must be informed and become active participants. They need to take on

¹¹Robert L. Clinton, "New Resources for Learning," Community and Junior College Journal, 43:6-7, June/July, 1973.

¹²George A. Wagoner, "Individualizing Instruction: When and How," Business Education Forum, 27:27-28, May 1973.

¹³Frank McCormick, "The New Media in Accounting Instruction: A Study of Current Thought and Practice in the University and the Public Junior College." (unpublished Doctor's dissertation, University of Iowa, 1965).

the role of "preparation, supervision, coordination, reinforcement of responses, and evaluation of results."¹⁴

Although innovative and promising approaches to education appear to have significant implications for accounting instruction, the justification for the present study is substantiated in the need to develop and implement these approaches, as well as in the need for answers to questions concerning the extent of its effectiveness and the characteristics of students associated with various levels of success. Leonard West states that experimental research results in more immediate answers. "It is the only method of research which affords a direct attack on the primary question in all of education-- how to bring about the most effective learning."¹⁵

Significant progress in technological development is a reality; innovative ideas and teaching techniques are revealed widely in recent publications. However, carefully planned strategies for learning and experiments for validating these strategies must become a reality if more effective learning is to take place.

STATEMENT OF THE PROBLEM

The problem of this study was twofold: (1) to develop an instructional strategy including video tapes and related materials to

¹⁴Wilbur Schramm, Instructional Television--Promise and Opportunity, ERIC, ED 019 848, (January, 1967).

¹⁵Leonard J. West, "Experimental Research in Business Education," National Business Education Quarterly, 35:52, Winter, 1966-67.

utilize the technological developments in television for the first five weeks of the first year of college accounting instruction; and (2) to validate through classroom implementation and evaluation investigator-prepared video tapes for self-paced, video-tutorial instruction for the first year of college accounting.

PURPOSE OF THE STUDY

The purpose of the study was to develop and validate through classroom use an alternate strategy which might lead to a more effective means of providing for individual learning rates in the first year of college accounting.

HYPOTHESES

In order to provide direction in this study, the following null hypotheses were formulated:

- H₀₁ There is no difference in the population mean scores associated with the experimental group and the control group as measured by the vocabulary ability scores on the pretest.
- H₀₂ There is no difference in the population mean scores associated with the experimental group and the control group as measured by the reading comprehension scores on the pretest.
- H₀₃ There is no difference in the population mean scores associated with the experimental group and the control group as measured by the quantitative ability scores on the pretest.
- H₀₄ There is no correlation between academic aptitude (when defined as a linear combination of scores on vocabulary ability, reading comprehension, and quantitative ability) compared with achievement as determined by scores on a teacher-made criterion-achievement test administered after the first five weeks of instruction in the first-year accounting course.

- H₀₅ There is no difference in the population mean scores associated with the experimental group taught by the video-tutorial method and the control group taught by the lecture-demonstration method as determined by scores on a teacher-made criterion-achievement test administered after the first five weeks of instruction in the first-year college accounting course.

DEFINITION OF TERMS

To aid the reader in analyzing and interpreting the results of this study, the following definitions of terms are provided:

Accounting cycle: The procedures followed in recording and reporting data in the permanent accounting system for a given period of time. This is the first sequence in the Principles of Accounting course.

AICPA Orientation Test: the American Institute of Certified Public Accountants aptitude test, Form D, made up of three subtests--verbal, based on vocabulary ability; verbal, based on reading comprehension of business situations; and quantitative, based on business arithmetic problems.

Lecture-demonstration method: the instructional method employing the traditional lecture, demonstration, textbook, and overhead projection with transparencies commonly used in accounting instruction.

Monitor-player unit: a color television set or monitor and the attached player unit capable of converting the videocassette tape signal to the monitor.

Principles of Accounting: the first-year course in college accounting, ACCT 211, taught at Virginia Western Community College.

Self-paced video-tutorial instruction: the method of learning in which primary instruction is presented by means of television videocassette tapes in color either individually or in small groups for three hours per week with the teacher always present to manage the learning environment and to tutor as individuals or groups need help. Tapes are available in the learning lab outside of the three hours; however, no teacher is available at times other than the three scheduled hours.

Videocassette: a self-contained, sealed unit that holds a reel of 3/4-inch color videotape and a take-up reel, ranging in duration from 10 to 60 minutes.

DELIMITATIONS OF THE STUDY

To assist the reader in better understanding the scope and magnitude of the study, the following delimitations are presented.

The classroom validation was conducted at Virginia Western Community College, Roanoke, Virginia, during the first five weeks of Winter Quarter, 1976. The study consisted of five classes of Principles of Accounting, ACCT 211, made up of 113 students. Each class was scheduled for three hours per week with three quarter hours of credit for the Winter Quarter. Teachers were assigned by the division chairman in the routine planning of the total winter schedule. The investigator was assigned three of the five class sections included in the study: two experiment classes and one control class. The two remaining classes were assigned to two cooperating teachers.

Both the traditional and experimental groups used Fundamental Accounting Principles, Seventh Edition, by William W. Pyle and John Arch White. Both groups used supplementary materials consisting of working papers made up of blank forms for use in completing the practice problems. In addition, study guides were used by the experimental group.

NEED FOR THE STUDY

Morrison views education as a branch of communications. He states that unfortunately the textbook has been predominant as the communications medium. Yet learners, exposed to mass media at an early age, tend to regard the book as only one means which may be used.¹⁶

The teacher is going to have to adapt. He is going to have to learn to use the powerful array of media available. He is going to have to rely on the communications experts, involving them in his work at every stage. Instead of ignoring or shunning new media, he is going to have to become a pioneer in communications research and innovation.¹⁷

The unsuccessful attempts of students in the first year of college accounting support the need to develop and validate flexible methods of communication. Accounting is the development of a skill involving a series of objectives, each being dependent upon the mastery of the preceding ones. The traditional lecture-demonstration approach

¹⁶Sean Morrison, "Education, Communications Media and the Generation Gap," Audio-Visual Technology and Learning, 6:4, January, 1973.

¹⁷Ibid., p. 4.

necessitates the uniform attainment of objectives by students in the same period of time, without any provision for individual learning differences. Consequently, those students in accounting who are not able to achieve the objectives at any stage in the course have a reduced probability for success.

Professional educators have the responsibility of maintaining and improving the educational level of society. A committee of the National Association for Business Teacher Education issued a statement supporting this responsibility and suggesting that media instruction, including audio instruction and video instruction, can be used to solve many of the problems of education.¹⁸

The development and validation of a video-tutorial, self-paced approach to accounting instruction should serve as a guide for colleges needing a more flexible method of instruction to provide for individual differences in the learning rates of their students.

This study should contribute, therefore, to bringing about new insights concerning an alternate approach to the teaching of accounting principles.

BASIC ASSUMPTIONS

The basic assumptions of this study were:

1. Intact class sections would result in equivalent groups for

¹⁸National Association for Business Teacher Education Bulletin No. 90, "Innovative Means for Renewing Business Education: Modular Scheduling, Upgraded Classes, Audio-Instructional Techniques, Computer-Assisted Instruction," 1970, p. 60.

the purpose of comparing two teaching methods.

2. Assignment of teachers to classes by the division chairman would result in competent instruction.

3. Five weeks of initial instruction in the first-year college accounting course would be a sufficient length of time to use an alternate instructional approach for the purpose of evaluating the approach.

4. Implementation and evaluation of an alternate instructional approach in one community college would provide an indication of the effectiveness of the approach.

5. Objectivity of the investigator would be maintained in comparing investigator-prepared videocassette tapes and related materials when the investigator was the classroom teacher in the experimental classes and one of the three control classes.

CHAPTER 2

REVIEW OF RELATED LITERATURE

In order to provide a basis on which to carry out the current study, an examination of related articles, books, reports, speeches, and research studies was completed. They are presented in the following sections:

1. Development of learning materials.
2. Audio-visual approaches in business education.
3. Audio-visual approaches in accounting.
4. Summary of related literature.

DEVELOPMENT OF LEARNING MATERIALS

When John Dewey's Laboratory School at the University of Chicago was established in 1896, models of innovation and excellence were combined with inquiry. Dewey felt that the primary function of the laboratory school was to create new methods and thereby lead to a gradual change in education.¹⁹ Recent progress in research methods has made it possible for educators and researchers to combine their efforts in order that systematic inquiry might play a major role in development projects and the management of educational systems.²⁰

¹⁹Lee J. Cronbach and Patrick Suppes (eds.), Research for Tomorrow's Schools: Disciplines Inquiry for Education (London: The Macmillan Company Collier-Macmillan Limited, 1969), pp. 49-52.

²⁰Ibid., pp. 269-271.

According to Patton, Hunt, and Berg, pacing is a type of individualized instruction in which the students proceed through the same amount of material at their own rate of speed. They justify individualized instruction on the basis that educators have stated for many years that students are different; evidence indicates that although students respond in an individual manner in keeping with their past experiences and individual learning styles, the typical educational setting involves students listening while the authority figure talks. The authors further state:

There is also evidence that only between 15 and 20 percent of the students at a particular grade level may actually be working at that level. This means that the other 80 to 85 percent of the students are achieving either above or below; therefore, a particular grade-level designation for a child is a mythical situation.²¹

Hunt and Berg devised eight steps in developing individualized instruction to assist the teacher. An outline is listed below:

1. A philosophy of education must be formulated and agreed upon which emphasizes the worth and dignity of each individual student.
2. Broad educational objectives must be formulated in light of the stated philosophy.
3. A pretest should be constructed and then administered to the students. The pretest should cover the basic elements deemed important in the content to be taught.
4. Individualized objectives should be formulated for each student according to his or her needs, interests, and abilities.

²¹William E. Patton, John J. Hunt, and Lyle L. Berg, "Pre-planning for Individualized Instruction," Business Education Forum, 26:14-15, December, 1971.

5. Content should be carefully selected and prepared to meet the demands placed upon it by the previous four steps of the teaching model.
6. Appropriate resources (human and material) are essential to the fulfillment of the individualized instructional program. . . . It is strongly suggested that a multi-media approach to the instructional program be implemented because of the different learning styles of the students. . . . Material should stimulate as many of the senses as possible.
7. Individualized evaluation is essential to individualized teaching and the learning process.
8. At this point the students are given the opportunity to proceed to new material, to be recycled through some of the material covered previously, or to be recycled through similar but different material which was not mastered the first time.²²

In a report to the President and the Congress of the United States, Gagne initially expresses the concern that college instructors attempt to emulate their own professors, thereby perpetuating many traditions which were not derived from sound theories of learning.²³

Gagne includes in this paper a description and comparison of the four learning theorists who have, in his opinion, ". . . presented ideas of major importance to the design of instruction. These are Miller, Skinner, Gagne, and Ausubel."²⁴

Miller's principles fall into four categories: motivation (the student must want something); cue (the student must notice

²²Ibid., p. 15.

²³Robert M. Gagne, "Learning Theory, Educational Media, and Individualized Instruction" (support paper for "To Improve Learning: a Report to the President and the Congress of the United States by the Commission on Instructional Technology," 1970), ERIC ED 039 752, p. 1.

²⁴Ibid., p. 5.

something); response (the student must do something); and reward (the student must get something he wants). Cues can be implemented through such simple procedures as differences in the loudness of the voice, by the use of pointers and markers, and by the use of color and contrast. An important reward for the student is finding out that he has done well.²⁵

Skinner's views, as outlined by Gagne, consist of stimulus control, cue, shaping, and successive approximation of stimulus control.²⁶

Gagne's theories are described by the author as more specifically for instruction than the two previous viewpoints. The first principle is that of distinctive conditions for different kinds of learning. Concept learning, principle learning, and problem solving are three types of learning for most high school and college subjects. The second principle is called cumulative learning. "According to this theory, there is a specifiable minimal prerequisite for each new learning task. Unless the learner can recall this prerequisite capably, . . . he cannot learn the new task."²⁷ Gagne clarifies this principle by illustrating that mastery, not exposure, is required for the desired learning to take place.²⁸

Ausubel's theories of learning include subsumption, progressive differentiation, and consolidation. Subsumption involves the incorporation of a new idea into already existing knowledge; progressive,

²⁵Ibid., pp. 5-7.

²⁶Ibid., pp. 7-8.

²⁷Ibid., p. 9.

²⁸Ibid., pp. 9-10.

the introduction of general ideas first with detail and more specific ones next; consolidation, the mastery of ongoing lessons before new ones are introduced; and integrative reconciliation, the relationship of new ideas to existing knowledge with inconsistencies reconciled. Gagne comments that Ausubel finds consolidation and integrative reconciliation rarely followed by actual teaching procedures or textbook writers.²⁹

According to Tonne, the following major questions must be answered in planning a course of study:

1. Why? (Position-training justification.)
2. What? (Activities, attitudes, and traits.)
3. How well? (On the acquaintanceship or mastership level?)
4. Where? (On the job? In school? After hours?)
5. What equipment and facilities? (How many units? Special training manuals?)
6. When and how long? (Grade level of students and ability level? One week? One month? As part of another project?)
7. In what sequence? (Chronological? Most important topics first?)
8. How? (How are duties performed? How learned?)
9. How teach? (To what degree?)
10. Who shall teach? (Job supervisor or high school staff? Both?)
11. To whom? (Boys? Girls? Both? Ability level?)
12. How evaluate? (By follow-up? Special tests?)³⁰

Tonne states: "Much further research must be done in order to determine objectively the materials used for business subjects. . . .

²⁹Ibid., pp. 10-11.

³⁰Herbert A. Tonne, Principles of Business Education (New York: Gregg Publishing Division, McGraw-Hill Book Company, Inc., 1961), pp. 242-243.

The more objective the selection of subject matter, the more significant the curriculum materials will be."³¹

Concerning the mastery level and the length of time required, Kurland expresses this opinion:

. . . Every learner is handicapped in some way--the fast, by being held down to the pace of the slower, with the attendant boredom, frustration, and loss of powers not sufficiently exercised; the slow, by never quite mastering a subject before being forced to move along to the next topic; and the average--but there is no one average in everything! With technology we can come closer to insuring that the fast learner moves ahead at a pace adjusted to his capacity and that the slow learns thoroughly each lesson before he is allowed to move ahead, thus eliminating the perpetual frustration which must be a major obstacle to his educational achievement.³²

Carpenter lists four guidelines for use in planning and executing learning strategies:

First, design and provide varied and balanced patterns of conditions for learning. Vary sizes and composition of learning groups. Vary schedules. Balance study in splendid isolation for depth with discussions in groups for brightness and interest.

Second, design and provide conditions for learning which are like or which simulate the future conditions under which the individuals under consideration will continue to learn during their whole life cycle. There is, pertinent to our topic of teleinstruction, little prospect that the radio, the telephone, television, and motion picture films will disappear as sources of information, instruction and entertainment.

³¹Ibid., p. 256.

³²Normand D. Kurland, "Educational Technology in New York State: Theory, Practice, and the Future" (support paper for "To Improve Learning: a Report to the President and the Congress of the United States by the Commission on Instructional Technology," 1970), ERIC ED 039 757, p. 4.

Third, whatever the conditions of learning and learning technology, students need training in the strategies and skills for learning under the special conditions arranged or provided for formal learning. This proposition applies especially to individualizing learning and to planning for students to study independently.

Fourth, students should be taught in ways which lead them to become autonomous learners who are weaned both from their parents and teachers. The autonomous learner is freed from school requirements and restraints. He sets his own learning tasks, selects his own materials and methods, he achieves his own goals and reaps his own rewards.³³

Carpenter notes some specific recommendations for further development of instructional broadcasting that could lead to individualized learning. He feels that a means should be developed for informing the viewers immediately of the correctness of responses to questions, problems, or issues; and a record should be made of a unit of instruction that could be studied at the convenience of the learner. In addition, according to Carpenter, materials should be coordinated for use with televised instruction.³⁴

In planning a television production, Lundgren describes some principles of good instructional television which he considers essential to the overall effectiveness. The first point he makes is that there should be full coordination between the video and the audio; otherwise, each will detract from the other. A second point suggests

³³C. R. Carpenter, "Teleinstruction and Individualized Learning, Academy for Educational Development, Inc." (support paper for "To Improve Learning: a Report to the President and the Congress of the United States by the Commission on Instructional Technology," 1970), ERIC, ED 039 766, pp. 6-7.

³⁴Ibid., pp. 19-20.

students are overpowered with facts. Lundgren feels that the presenter must have certain characteristics to be effective. This individual should be able to create an interaction with the viewers, stimulate students, display interest and transmit some of this feeling to the viewers, and be liked by those learning from the presentation.³⁵

Wilbur Schramm reports the results of a review of the literature based on the message conveyed by instructional television rather than comparisons of the medium with conventional instruction. Two variables, simplicity of presentation and active participation by the students, appear to be significant in contributing to improved learning strategies.³⁶

Schramm summarizes his findings as follows:

Color seems not to increase learning unless color is what is to be learned or unless it is the best means available to code some discriminations that are to be learned.

A big screen seems to be of no advantage to learning if the ordinary television screen can be seen clearly enough to pick out the details that are to be learned.

Students like a "talkback" system but seem to learn no more with it than without it.

Visual embellishments do not usually help learning unless (like directional arrows) they can help organize content that is not inherently well organized or (like animation) help a viewer to understand a process or concept that is very hard

³⁵Rolf Lundgren, "What Is a Good Instructional Program, Quality in Instructional Television, (Honolulu: The University Press of Hawaii, 1972), pp. 6-22.

³⁶Wilbur Schramm, "What the Research Says," Quality in Instructional Television, (Honolulu: The University Press of Hawaii, 1972), pp. 44-67.

to understand without such simplification. In other words, visual embellishments per se are not especially useful in instructional material.

No advantage has been demonstrated for existing three-dimensional projection.

No learning advantage has been demonstrated for "professional" or "artistic" production techniques such as dollying rather than cutting, key rather than flat lighting, dissolves, wipes, fades, etc.

Eye contact seems not to contribute to learning, although it may contribute to persuasion.

There is very little evidence that narrative presentation ordinarily has any learning advantage over expository or that adding humor adds to learning effect.³⁷

Reflection-level learning, as described by Bigge, offers additional insights into the development of a learning strategy. In this approach to learning, the student turns his thoughts to a critical examination of an idea in terms of the evidence which supports it and toward the conclusions to which it points. It necessarily requires the learner to become more involved, to think critically, and to exercise original ideas. Bigge concludes that when reflective teaching is effective, students of all ability levels are brought up to maximum or near maximum performance.³⁸

AUDIO-VISUAL STRATEGIES IN BUSINESS EDUCATION

In this section, the literature pertaining to audio-visual procedures in business education which appear to have implications

³⁷Ibid., p. 65.

³⁸Morris L. Bigge, Learning Theories for Teachers (New York: Harper and Row, 1964), pp. 324-350.

for accounting instruction is presented.

Lauer³⁹ conducted a study evaluating the effectiveness of using video tapes prepared by the Utah State University Business Education Department in the teaching of intermediate typewriting. There were 60 experimental students, who received instruction via the video tapes, and 60 control students, who received instruction in conventional teacher presentations.

Two of Lauer's conclusions were as follows:

No matter what difficulty of copy was used in the testing program, the error rates of the students seemed to fall closely within the same range.

The students in the experimental group answering an evaluation form pertaining to the video instruction gave high approval to the use of prepared video tapes as a medium of instruction.

Zahn⁴⁰ conducted a study at the University of Montana in which an audio-visual-tutorial instructional strategy was used for teaching mathematics by machine. Three of his recommendations pertain to other business subjects as well as to office machines:

A study or studies should be completed to determine whether persons ranking in the low range on the pretest would meet subject standards within a teacher-centered instructional approach.

Similar studies in other skill subjects should be conducted to support or refute the findings of this study.

³⁹William Charles Lauer, "Evaluating Effectiveness of Using Business Education Department Prepared Video Tapes in the Teaching of Intermediate Typewriting at Utah State University" (unpublished Doctor's dissertation, Utah State University, 1972), pp. 130-133.

⁴⁰Donald Karl Zahn, "A Study to Evaluate the Effectiveness of Audio-Tutorial, Slide/Tape Instruction Versus the Flowcharted Method of Self-Instruction in Machine Calculation" (unpublished Doctor's dissertation, University of Montana, 1972), pp. 79-83.

A study should be made replacing lecture-type instruction with the AVT approach to determine whether the method is feasible in non-skill courses, e.g., business law, accounting, consumer economics.

An additional recommendation that Zahn lists which was derived from the student opinionnaire indicates that an attempt should be made to provide teacher contact to answer questions. Two of the implications of the study based on Zahn's observations have significance for varied types of individualized instruction:

. . . Traditionally, students are required to master whatever skill or knowledge they can within arbitrarily assigned and predetermined periods of time. Under the AVT system it is no longer advantageous to determine a beginning and ending date for a single large group of students. It would be more economical and realistic to distribute starting times for individual students over a period of time to maximize equipment usage.

By removing the barriers of ending dates, students would be able to meet predetermined performance standards. The slower students could take as much time as they needed to meet the specified requirements. Students would no longer be victims of time. Rather, all students would be granted the opportunity to successfully complete a course.

In a series of experiments conducted to test the effectiveness of televised instruction, Gropper and Lumsdaine found that students who made active responses rated significantly higher on achievement tests than those who passively viewed the same lesson. Further, they found that correct responses of students resulted in a greater degree of effectiveness than active responses alone.⁴¹

⁴¹George L. Gropper and Arthur A. Lumsdaine, "An Experimental Evaluation of the Contribution of Sequencing, Pretesting, and Active Student Response to the Effectiveness of Programmed TV Instruction. Studies in Televised Instruction." ERIC, ED 003 649.

In a comparison of programmed materials and standard textbooks in college instruction, Fisher and Malpass conclude that student performance should not be the only basis for selecting course materials. "Other factors, including performance or resistance from students and teachers, as well as economy in time and money, seem to be more important than the minor differences observed in performance."⁴² These researchers advocate ". . . careful planning and better adaptation of patterns of instruction to the use of programmed textbook material."⁴³

AUDIO-VISUAL STRATEGIES IN ACCOUNTING

A study by Flaherty,⁴⁴ "The Relative Effectiveness of Closed-Circuit Television as a Communication Medium for Instruction in Accounting," was conducted to determine the effectiveness of CCTV as a communication medium for teaching the first course in accounting compared with the traditional lecture-demonstration method. Comparisons of live televised lectures and video taped lectures with small (fewer than 50 students) and large (more than 50 students) traditional lecture sections were made based upon student achievement on common final

⁴²Margaret B. Fisher and Leslie F. Malpass, "A Comparison of Programed and Standard Textbooks in College Instruction" (Cooperative Research Project No. 1921, University of South Florida, 1963), pp. 53-54.

⁴³Ibid., p. 54.

⁴⁴Daniel Joe Flaherty, "The Relative Effectiveness of Closed-Circuit Television as a Communication Medium for Instruction in Accounting" (unpublished Doctor's dissertation, Texas A&M University, 1974).

examinations, grades in the first course in accounting, and grades in the next course in accounting.

In all comparisons of grades in the next course in accounting, no significant difference was found; thus the researcher concludes that the medium used for the first course in accounting had no apparent effect on student achievement in the next course in accounting.

The following conclusions result from the study:

There is strong evidence to support the hypothesis that the achievement of students who receive instruction via a low-cost (less than \$3,000), unsophisticated CCTV system is better than the achievement of students in a traditional small lecture section.

The achievement of students receiving instruction via CCTV or video taped lectures is as good as or better than the achievement of students receiving instruction in a large lecture section.

Student responses to a questionnaire handed out at the end of each semester indicated that a majority of students preferred to be in a large lecture section rather than in a small CCTV section.

A developmental study by Wagnon⁴⁵ was based on six steps of the accounting cycle. Microunit-teaching modules were developed utilizing information gathered from examination of relevant materials and a survey of secondary accounting students within a twenty-mile radius. The modules were taught by student teachers and recorded on video tapes which were evaluated by an outside panel of business educators. The microunit-teaching modules were found to be successful for student

⁴⁵Thomas L. Wagnon, "A Study to Develop Microunit-Teaching Modules for the Six Steps of the Accounting Cycle" (unpublished Doctor's dissertation, University of Arkansas, 1974).

teachers to practice strategies of teaching. It was recommended that studies be made to validate the revised materials for various lengths of time.

Johnson,⁴⁶ whose subjects were 390 male accounting students in 10 classes in selected colleges of the City Colleges of Chicago, studied the variables associated with success, persistence, and failure in accounting. Statistically significant differences were found at the .01 level of confidence among the successful, those with persistence, and the unsuccessful regarding the social and cultural variables of personal values and career consciousness and regarding the demographic variables of age, marital status, employment status, high school reading problems, persons influencing college attendance, and college credit hours completed. Statistically significant differences were found at the .05 level of confidence among the three groups concerning the demographic variables of high school graduate status, number of job changes, college reading problems, and fathers' educational attainments.

The purpose of a study completed by Brooke⁴⁷ was to determine the differences in the achievement of junior college accounting students who were taught by the conventional approach, the managerial

⁴⁶Edwin R. Johnson, "A Study of Selected Social and Cultural Concomitants of Success, Persistence, and Failure of Community College Students," Journal of Business Education, 49:210, February, 1974.

⁴⁷Edna Mae Brooke, "The Effectiveness of Three Techniques Used in Teaching First-Semester Accounting Principles to Technical Junior College Students" (unpublished Doctor's dissertation, Arizona State University, 1974).

approach, and the programmed materials approach. The final sample consisted of 66 students who completed both the pretest and the posttest. Brooke concludes that the method of teaching accounting principles did not make a significant difference in the achievement of junior college accounting students.

Elliott⁴⁸ completed a study entitled "Individualized Instruction and Personality as Factors in Accounting Performance." The experiment involved 44 randomly selected beginning accounting students from a traditional community college, who were taught by the lecture-discussion method, and 44 randomly selected beginning accounting students from a community college oriented toward innovative methods, who were fully responsible for their own progress by using tape slides and supplementary materials with instructors and lab assistants available.

The following results were indicated:

An analysis of variance showed that no significant difference existed in achievement on the performance test in the two instructional approaches. In other analyses the results showed that personality type had no significant effect on student achievement; however, high-reading ability students performed better in both methods of instruction than did low-reading ability students ($p < .05$).

An analysis of data showed that students in the individualized method spent significantly less time in studying ($p < .05$).

An analysis of the global estimate of attitude toward school showed no difference between students in the two methods of instruction based on personality types.

⁴⁸John Monroe Elliott, "Individualized Instruction and Personality as Factors in Accounting Performance" (unpublished Doctor's dissertation, Rutgers University, The State University of New Jersey, 1973).

In analyzing data on the transfer problem, it was found that individualized students used more search initiative in problem solving ($p < .01$). Individualized students also spent more time in solving the transfer problem ($p < .01$) and had more correct problem solutions ($p < .01$). No difference was found in the number of correct definitions on the transfer problem between the two groups.

Another experimental study comparing achievement of accounting students taught by a self-paced method and students taught by the traditional method was conducted by Elsea⁴⁹ in a junior college. There were four intact classes consisting of 138 students; the investigator and a cooperating teacher each had a self-paced class and a traditional class.

The following conclusions were drawn:

1. Students who were taught by the self-paced method of instruction achieved as well in Principles of Accounting I as students taught by the traditional method.
2. The AICPA Orientation Test (Form D) and the ACT Test are both significant predictors of achievement in Principles of Accounting I. These instruments can, therefore, be used as pretests to indicate which students will likely achieve well in Principles of Accounting I and which students will likely have difficulty in the course.
3. Students with positive attitudes toward accounting as measured by the Dow Opinionnaire tend to score higher in achievement than students with negative attitudes.
4. The amount of previous instruction in bookkeeping and accounting experienced by students is a significant predictor of achievement in Principles of Accounting I. Consequently, students who have received previous instruction are more likely to succeed in accounting than students without previous instruction.

⁴⁹John Edward Elsea, "A Comparison of Achievement in Elementary Accounting Between Students Taught by the Self-Paced Method and Students Taught by the Traditional Method" (unpublished Doctor's dissertation, University of Northern Colorado, 1973).

5. Students taught by the self-paced method of instruction do not differ significantly in attitude toward accounting from students taught by the traditional approach.
6. The method of instruction employed in a class was not a major reason for student withdrawal from Principles of Accounting I.

Baxter⁵⁰ also concludes that there is no significant difference in achievement between the students taught by the computer-augmented method and the students taught by the traditional method. His design included a provision for comparing non-degree with degree students; there was no significant difference found in the two different degree objectives. He recommends that a similar study should be conducted in other areas of the collegiate accounting curriculum.

Another experimental study comparing computer-augmented instruction with traditional instruction in accounting was carried out by Saul at Miami-Dade Community College.⁵¹ Three groups, using different materials, were involved in the experiment. No significant differences were found to exist in attrition; however, there were significant differences found in the achievement of the three groups. At the end of one semester, both the computer-augmented experimental group using teacher-prepared materials and the conventional group were superior to the

⁵⁰Clifton Arthur Baxter, "The Effects of Computer-Augmented Instruction on Achievement in the Collegiate Principles of Accounting Course" (unpublished Doctor's dissertation, University of Georgia, 1974).

⁵¹William Eugene Saul, "An Experimental Study of the Effect of Computer-Augmented Instruction on Achievement and Attrition in Beginning Accounting at Miami-Dade Community College, North Campus" (unpublished Doctor's dissertation, The University of Tennessee, 1974).

computer-augmented experimental group using the commercially available materials developed by Pillsbury.

In 1961, Stone found that television instruction in accounting was well established in many universities and was increasing rapidly. He reveals that student reactions to television tapes were more enthusiastic than those of the faculty, except for TV teachers. The studies Stone cites consist of TV lectures and various provisions for laboratories. Results of the investigation reported in the survey indicate that students taught by means of TV learned accounting as well as those in live classes.⁵²

A later survey was conducted in 1965 by Jones and Pontius, who found that accounting instruction by television had generally been successful. The inference they drew was that the success of television as a medium in accounting instruction was highly dependent upon the enthusiasm and conscientious efforts of those responsible for implementing the program.⁵³

SUMMARY

The review of related literature points repeatedly to the need for additional development and testing of strategies to provide for individual learning differences. In the early 1970's, Leonard West

⁵²Willard E. Stone, "Developments in Accounting Instruction," The Accounting Review, 36:474-474, July, 1961.

⁵³H. Milton Jones and Vernon E. Pontius, "Survey of Accounting Teaching via Television," The Accounting Review, 40:863-866, October, 1965.

summarized his philosophy concerning individualized instruction as follows:

In conclusion, it would appear that very often the traditional rigidities of mass instruction have been a bar to individualization. The chief fault is the tendency to march all students along some predetermined fashion convenient for or familiar to the teacher. It is too often forgotten that the schools exist for learners, not for teachers; that the teacher is the servant, not the master, of instruction.⁵⁴

West stresses the importance of providing an alternate approach; without this provision, the best the teacher can do is test often and adjust the pace of instruction for the group as a whole. He contrasts adjusting the rate of instruction for the group with individualizing the rate of instruction.

. . . Whatever the causes of differences in student achievement during a particular course of instruction, individualization boils down to taking those differences in achievement into account in determining what each student is to be taught next, what he is to do next, what his next objective is to be.⁵⁵

An application of some of the theories of learning reviewed in this chapter may be found in the techniques for accounting instruction which Huffman and Stewart recommend. An outline of the techniques is given below:

1. Determine specific objectives which are measurable.
2. Give a presentation of new material before making a required assignment.
3. Call on students continuously during the presentation by asking leading questions.

⁵⁴Leonard J. West, "Individualization of Instruction," Business Education Forum, 25:21, May, 1971.

⁵⁵Ibid., p. 20.

4. Use problem-solving situations throughout the presentation and involve students in some manual activities.
5. Give students an opportunity, during the period, to apply the principles presented in the day's lesson.
6. Give relatively short homework assignments using the principles in the day's lesson.
7. Give a vocabulary preview at the beginning of each new chapter and hold the students responsible for the meaning by frequent quizzes.
8. Demonstrate often and utilize aids whenever possible.
9. Test frequently, using short tests.
10. Organize small groups of students with similar ability to work on certain class assignments and projects.⁵⁶

Concerning the need for the development of flexible approaches to learning, Huffman and Stewart indicate the need for accounting instruction to be organized to accommodate students with varying levels of ability:

At whatever level the student may be, it is the responsibility of the teacher to help each one develop to his optimum. Provisions must be made for the slow learner and, at the same time, the fast learner must not be held back.⁵⁷

The literature reviewed reveals that the educational outcomes from different methods of instruction are not significantly different. However, the lack of available studies reporting the development and implementation of strategies integrating technological advances in a total approach to provide for individual differences precludes any valid conclusion in this area.

⁵⁶Harry Huffman and Jeffrey R. Stewart, Jr., "Assessing Classroom Activities," The Eastern Business Teachers Association Yearbook. 40:194-196, (New York: The Eastern Business Teachers Association, 1967).

⁵⁷Ibid., pp. 193-194.

CHAPTER 3

PROCEDURES

This study was designed to develop and to validate through classroom implementation and evaluation an alternate approach for first-year college accounting instruction that would accommodate individual learning rates through the use of investigator-prepared video-cassette tapes.

The research methodology is divided into the following sections and subsections:

1. Developmental stage.
2. Validation stage.
 - a. Implementation of the strategy.
 - b. Evaluation of the strategy.

DEVELOPMENTAL STAGE

A unit in the first-year college accounting course, the accounting cycle, was selected as the content for the study. It requires approximately five weeks when the students meet three 50-minute class periods per week. The accounting cycle was divided into nine specific units.

The investigator prepared a pilot videocassette tape in color at WBRA, a public television station in Roanoke, Virginia, during April, 1974. The work sheet was chosen as the topic for the pilot tape because

it is a wide form with ten columns of figures on which to focus, both on individual amounts and the extension of each amount, as well as the complete work sheet. Therefore, the investigator felt the work sheet should provide an opportunity to test the feasibility of teaching and demonstrating typical accounting forms and principles by use of the television medium. The first time the work sheet was taped, five hours were required to tape 32 minutes; the second time it was taped to improve the presentation, three hours were required. The latter tape was placed on exhibit for four days at the national convention of the American Association of Community and Junior Colleges in April, 1974, in Washington, D. C., where comments and suggestions were received and considered. Those administrators in attendance offered encouragement and enthusiasm for continuance of the project.

The pilot tape was used to teach the work sheet to three classes of accounting students at Virginia Western Community College during the Fall Quarter, 1975, with student comments and observations noted. Thirty-two minutes were required to view the tape; students felt that the tape was helpful but was too long to hold their interest. According to the literature cited, active student participation is highly desirable to maintain student interest. When the series was later taped, provision was made for active, correct student responses at various intervals; and each tape was limited to one concept, thereby reducing the overall viewing time of each tape.

The experience gained in writing the script, preparing the visuals, and working out the system for the pilot tape, as well as

exhibiting and teaching it, served as a background for developing the series. The principles and theories of learning included in the review of the literature also served as a guide in planning the entire strategy.

The accounting cycle was selected for the content of this study. First, it requires no previous learning, permitting students to begin on a comparable basis. Second, the accounting cycle is typical of the overall objectives of accounting. And third, it is the foundation upon which the cycle approach to teaching accounting is based.

Tonne describes the cycle approach as follows:

One of the uniquely desirable qualities in the teaching of bookkeeping that should not be lost regardless of how the subject is organized and that might well be used by teachers of other subjects is the concept of the cycle sequence of teaching. A complete but highly simplified presentation of the entire process to be taught is given very briefly. By using a cycle approach in teaching bookkeeping, teachers constantly review, learn, and relearn those elements that are considered most fundamental in a constantly expanding spiral, so that at the end of a program certain fundamental elements have been gone over so thoroughly and so well that the learner cannot help having some understanding of, and ability in, the techniques In bookkeeping, everything can be worked into the cycle, first in simple form and finally through spiraling of learning brought into the most complex form desirable.⁵⁸

The accounting cycle was divided into nine units called modules; performance objectives were formulated for each module. The units and performance objectives are outlined below with the viewing time of each module indicated:

⁵⁸Herbert A. Tonne, Estelle L. Popham, and M. Herbert Freeman, Methods of Teaching Business Subjects (New York: Gregg Division, McGraw-Hill Book Company, 1965), pp. 309-310.

Module 1 - Introduction to Accounting - 10.45 minutes

1. Define accounting.
2. Define and give examples of principles of accounting.
3. Distinguish between private and public accounting.
4. Define balance sheet and explain the relationship of its elements--assets, liabilities, and owner's equity.
5. Define income statement and explain the relationship of its elements--revenue and expenses.
6. State the fundamental accounting equation.

Module 2 - Transactions - 13 minutes

1. Given transactions, recognize increases and decreases in assets, liabilities, and owner's equity.
2. Organize transactions in accounting equation format.
3. Prepare a balance sheet.

Module 3 - Journalizing - 14 minutes

1. Define account and t-account.
2. Define debit and credit.
3. Define journal.
4. Define journalizing.
5. Analyze transactions.
6. List the steps in journalizing.
7. Record transactions in the journal.

Module 4 - Posting - 19.5 minutes

1. Define ledger.
2. Define posting.
3. List the steps in posting.
4. Define footing and account balance.
5. Define and state the purpose of the trial balance.

Module 5 - Adjusting Entries - 21 minutes

1. Define adjusting entries.
2. Define and explain the significance of the matching principle.
3. Define and give an example of a contra account.
4. Journalize and post adjusting entries.
5. List and give an example of the four types of adjustments.

Module 6 - Financial Statements - 27 minutes

1. Define income statement accounts, nominal accounts, and temporary accounts.

2. Define balance sheet accounts, real accounts, and permanent accounts.
3. Prepare a classified balance sheet.
4. Define current assets, plant and equipment, and intangible assets.
5. Define current liabilities and long-term liabilities.

Module 7 - Closing Entries - 19 minutes

1. Define closing the ledger and state the two objectives.
2. Define closing entries.
3. Define post-closing trial balance.
4. List four types of closing entries.
5. Prepare closing entries.

Module 8 - Work Sheet - 20.5 minutes

1. Define work sheet.
2. Locate errors efficiently when the trial balance is out of balance.
3. Prepare a work sheet.

Module 9 - The Accounting Cycle - 10 minutes

1. Define post-closing trial balance.
2. List the order in which each part of the accounting cycle is completed and explain the significance of the order.
3. Prepare each requirement of the accounting cycle.

Production procedures. A criterion-referenced achievement test was prepared from the performance objectives. Applying the theories of learning related in the review of the literature, the investigator (who was the television teacher) prepared scripts and visuals to accomplish the performance objectives and prepare students for the achievement test. The visuals consisted of two types--blank forms used in accounting and cards with artwork used for special emphasis and visual communication. The blank forms measured 24 inches by 32 inches; after being drawn on white poster board with black ink, they were covered

with translucent film to make possible erasing and reuse when necessary. Each form was bordered with yellow, 3/4-inch tape to define the form and consequently improve the image on the television monitor. In Figure 1, the teacher is referring to one of these forms. The visuals were prepared on poster cards measuring 12 inches by 15 inches to identify the series, the teacher, the end of the tape, and to give instructions to stop, start again, and rewind the tapes. Visuals were also prepared to illustrate concepts and cue responses. An example of this type is illustrated in the picture presented in Figure 2, which was taken from the television monitor. An effort was made to illustrate or demonstrate all content as it was being explained by the teacher.

The scripts included the message of the teacher, along with the corresponding visuals, and an indication of the desired camera focus at all times. A sample script is reproduced in Appendix B. Each script was delivered to the director one day before the scheduled taping so that his preliminary work could be in order, thereby saving studio time. The average studio taping session was three hours in length with approximately seven people involved in addition to the television teacher. One module was taped during each session. Features of the tapes included an introduction to the performance objectives to allow the learner to build on existing knowledge, verbal and printed performance objectives, visual demonstrations of every principle and application, use of color to distinguish steps or features, provision for the student to stop the tape and practice each new concept, and provision for the student to start the tape for a review of the concept and performance objectives.



Figure 1

Picture of the Set with the Teacher
Taken from the Television Monitor



Figure 2

Picture of a Visual Taken from the Television Monitor

The stage (or studio) set for this series was designed by the investigator and consisted of a revolving three-sided display unit, referred to in the script as a Tri-Vu, for use in demonstrating accounting principles and procedures, and a hickory-paneled podium; vertical strips were used in the background. The picture presented in Figure 1 shows the set as it appears on the tapes from the television monitor.

A videocassette tape in color for each of the nine modules outlined were produced at the Educational Systems Division of the Learning Resources Center at Virginia Polytechnic Institute and State University during October, November, December, 1975, and January, 1976. They were directed by John Moore, television production supervisor of the Learning Resources Center.

Production facilities. The main studio, which measures 25 feet by 30 feet, contains two IVC 500A color cameras; and the lighting consists of grid-hung 750W, 1000W, and 2000W fresnels, scoops, and lekos. A lighting control panel provides 12 channels of dimming. The main production control room contains video and audio control boards, a character generator, and full-monitoring facilities. Video is mixed on an Alma double re-entry switcher, with Riker special effects and CBS chromakey. A Datavision D-3400 character generator, used for titling and superimposing, provides two sizes of characters with border edging which roll and crawl. The character generator is outfitted with a tape unit for copy storage. A color background generator also feeds the switcher. Audio is mixed on a Taxcam 4 channel, 12-input board. Ampex

and Teac reel-to-reel tape decks, Spotmaster cart machines, and a turntable are also available. A complete Sony 2850 editing system, with programmer, is used for most program mastering and assembly. A CVS-504A time base corrector is used for mixing videotapes with studio productions and dubbing.

VALIDATION STAGE

The validation of the video-tutorial strategy developed by the investigator consisted of the implementation of the strategy and the evaluation of the results as measured by the scores on an investigator-prepared criterion achievement test.

Implementation of the Strategy

The video-tutorial method of instruction as interpreted in this strategy requires a room that can be arranged primarily for this type of instruction. The room used in this study was shared by classes using conventional instruction. So that the facilities were ready for use when the students arrived for classes, the teacher had to rearrange the furniture before each class meeting, which was time consuming and impractical on an ongoing basis.

Although flexible student access is one of the characteristics of this approach to instruction, the cost involved necessitated control over the equipment and tapes. Provision was made for storing the equipment and tapes when personnel was not available for supervision.

Video-tutorial instruction places the teacher in a new role. In addressing the use of television as a teaching device at the college

level, Evans states that ". . . diffusion of the technical innovations in the field of education has been slow and is almost always accompanied by suspicion and hostility." He further concludes from his research that instructional television appears to be more acceptable if teachers view it as an adjunct to present traditional teaching methods.⁵⁹

Two professors who were scheduled to teach first-year accounting at Virginia Western Community College during Winter Quarter, 1976, were invited and subsequently agreed to participate in the study by teaching two sections of the video-tutorial strategy developed by the investigator. When it became evident, however, that the basic instruction would be accomplished by the use of television presentations, both teachers expressed a preference to continue their conventional role in the classroom. In video-tutorial instruction, the teacher must be willing to assume the role of planner, manager, motivator, coordinator, and evaluator in order to maximize the learning experience.

Based on the literature cited and the experience encountered with the cooperating teachers, the three sections assigned to the investigator were divided into two experimental sections and one control section. The treatment of the three class sections was randomly assigned.

The equipment used in the implementation stage of the study was on loan from two vendors in the Roanoke area. An estimate of the cost

⁵⁹Richard I. Evans, Resistance to Innovation in Higher Education (San Francisco: Jossey-Bass, Inc., Publishers, 1968) pp. 34-35.

to provide comparable equipment would be in the range of \$1,000 for each television monitor-player unit.

Instructional procedures. Five color-television monitors with cassette player units were placed in the accounting classroom on portable stands at the end of 4' by 8' tables designed to accommodate six students. Headsets for each student and a copy of each of the nine videocassette tapes were placed on the shelf of each stand. A picture of the table arrangement with headsets and television monitor-player unit is shown in Figure 3. This arrangement permitted the students flexibility of viewing without leaving their stations; the headsets made it possible for some students at the table to work while others viewed the tapes. The floor plan of the classroom is illustrated in the proposed accounting lab in Figure 7.

An instructional manual was prepared by the investigator for each student, using the offset printing process, and was assembled in a spiral binder; a copy is presented in Appendix A. The purpose of the manual was to prepare the students for viewing each tape, to provide instructions to proceed through each new concept, to provide practice materials to try the illustrations viewed on the tapes, and to provide assignments of practice problems for classwork and homework.

The AICPA Orientation Test, Form D, was administered to all students in the study on the first class meeting of the quarter. On the second class meeting, students in the experimental classes were introduced to the video-tutorial method of instruction, taught how to use the equipment, issued instructional manuals developed by the



Figure 3

Picture of a Table with Headsets
and a Monitor-Player Unit

investigator, and asked to buy the textbook and working papers. The remaining time was used to view Module 1.

The teacher assumed the role of motivator, manager, evaluator, and tutor. At various times when groups had common questions and problems, the overhead projector, blackboard, or 23-inch television monitor was used for explanations and clarification needed by the class.

All class sections were scheduled for three 50-minute periods per week. The Virginia Western Community College Learning Lab assumed responsibility for the use of the tapes during scheduled hours of the day and evening; however, no tutoring assistance was available during those hours. All students were allowed to obtain help from the teachers during regular office hours.

The students learned how to use the equipment during the first hour of instruction and, without a structured procedure, formed informal groups of six or less who were working on the same general subject matter. Occasionally the teacher needed to coordinate the grouping arrangements in order that the students could progress without waiting for equipment. They gradually began reporting for class a few minutes early to get organized.

Assigned problems were turned in, checked by the instructor, and placed in each student's file for reference by both the student and the teacher.

A development that took place during the implementation of the strategy was the increased need for individual and group explanations

of practice problems. Since one of the primary objectives of video-tutorial instruction is responsiveness to student needs and weaknesses, opportunity for additional explanations was included in the total approach. As the five weeks progressed, small group tutoring increased.

Evaluation of the Strategy

The evaluation of the classroom implementation phase of the investigation consisted of statistical testing of the null hypotheses and descriptive statistics of the mean achievement scores arranged according to ability groups.

Population and sample. Five class sections of Accounting 211, Principles of Accounting I, were offered Winter Quarter, 1976, at Virginia Western Community College, a state-supported community college in Roanoke, Virginia, with an approximate enrollment of 5,500 students. An open-door admissions philosophy results in a wide range of individual differences. Although Roanoke is an urban locality, the service area of the college includes surrounding counties, which are basically rural.

Although random assignment of students was impractical, the groups resulted from the routine registration process at Virginia Western Community College where no attempt was made to organize class sections.

Concerning the reactive arrangements effect of randomization, Campbell and Stanley stated that ". . . a most prominent source of

unrepresentativeness is the patent artificiality of the experimental setting and the student's knowledge that he is participating in an experiment."⁶⁰

The students who participated in the classroom validation were not aware that a formal research study was taking place. The experimental groups were informed about the availability of the videotapes, given a brief history about the development of the tapes, and asked if they would like to use them for five weeks to help determine the effectiveness of the tapes. They appeared interested and willing to participate in the study. Since first-year accounting students at Virginia Western Community College are given the AICPA Orientation Test as a routine procedure, the reactive effects on external validity were minimized.

Popham and Sirotnik, in support of intact groups, pointed out the following consideration:

Disregarding the fact that often the only available source for the appropriate student sample will be found in school classrooms, there is a decided advantage in using realistic school situations to investigate relationships between educational variables. Typically, an investigator wishes to generalize research findings to real school situations, so his research is frequently (but not always) most generalizable when the investigation is conducted in the milieu of an authentic school environment.⁶¹

⁶⁰Donald T. Campbell and Julian C. Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago: Rand McNally & Company, 1963), p. 20.

⁶¹S. James Popham and Kenneth A. Sirotnik, Educational Statistics: Use and Interpretation (New York: Harper & Row, Publishers, 1973), p. 204.

Teachers were assigned to the five class sections by the division chairman in the course of planning the winter schedule. Of the three sections assigned to the investigator, two were randomly assigned to the video-tutorial experimental treatment and one to the lecture-demonstration control treatment.

The five class sections offered were used in the study with the same student arrangement and teacher assignment that would have resulted if the study had not taken place. A summary of the schedule of classes is given below:

| Class section | Teacher | Treatment | Hours and days offered | Number |
|---------------|--------------|--------------|------------------------|--------|
| 1 | Investigator | Experimental | 1-2 M W F | 19 |
| 2 | Investigator | Experimental | 6-9 F | 21 |
| 3 | Investigator | Control | 2-3 M W F | 24 |
| 4 | Cooperating | Control | 9-11 T 10-11 Th | 22 |
| 5 | Cooperating | Control | 5:30-7 M W | 27 |

In support of regular personnel conducting research in education, Campbell and Stanley advocate the following:

. . . An alternative model is for the ideas for classroom research to originate with teachers and other school personnel, with designs to test these ideas worked out cooperatively with specialists in research methodology, and then for the bulk of the experimentation to be carried out by the idea-producers themselves.⁶²

⁶²Campbell and Stanley, op. cit., p. 21.

Design. The design for this research was a quasi-experimental design referred to by Campbell and Stanley as a "Nonequivalent Control Group Design."⁶³ When random assignment of subjects is not possible, Ary, Jacobs, and Razavieh refer to this design as a "nonrandomized Control-Group, Pretest-Posttest Design."⁶⁴

The following diagram illustrates the design of the study:

| Group | Pretest | Independent variable | Posttest |
|-------|---------|----------------------|----------|
| E | O_1 | X | O_2 |
| ----- | | | |
| C | O_1 | | O_2 |

The groups were designated as E for the experimental group and C for the control group. The pretest was the control variable, and the video-tutorial method of instruction was the independent variable indicated by an X in the diagram. The dependent variable was the achievement on the criterion measure or posttest. Observations on the pretest are indicated in the above diagram by O_1 , and observations on the posttest are indicated by O_2 . The broken line refers to nonrandomization.

Data and instrumentation. The data in this study consisted of the following:

⁶³Ibid., p. 41.

⁶⁴Donald Ary, Lucy Cheser Jacobs, and Asghar Razavieh, Introduction to Research in Education (New York: Holt, Rinehart and Winston, Inc., 1972), pp. 254-255.

1. AICPA Orientation Test, Form D, consisting of vocabulary ability, reading comprehension, and quantitative ability subtests--used as the independent variables and used as the basis for dividing the students into ability groups.

2. Student age and sex--used to establish the comparable characteristics of the experimental group and the control group.

3. Investigator-prepared criterion-achievement test--used as the dependent variable.

The AICPA Orientation Test, Form D, is a 50-minute aptitude test. This test was used as a pretest by Butts and Prickett, who report a significant correlation coefficient of .442 and .431 at the .05 level of confidence at two institutions when the test was correlated with the scores obtained on the criterion measure prepared by Butts and Prickett. Their study was based on the first quarter of college accounting.⁶⁵

North used data compiled at Virginia Polytechnic Institute over a 12-year period to determine the validity of the AICPA Orientation Test for use in predicting achievement in accounting. The test results were correlated with first-year achievement scores as measured by the AICPA Level I Achievement Test and were found to have a significant correlation of .48.⁶⁶

⁶⁵F. Eugene Butts and Gary L. Prickett, "The Effect of Audio-Tutorial and Programmed Instruction Laboratories on Achievement in Accounting Principles" (unpublished Doctor's dissertation, Colorado State College, 1969), pp. 44-45.

⁶⁶Robert D. North, "An Evaluation of the Institute's Testing Program," The Journal of Accountancy, 107:65-67, December, 1959.

The present investigator prepared the criterion measure used as the post-achievement test and dependent variable.

In test construction, Thorndike and Hagen state guidelines for strengthening content validity:

. . . A teacher's own test has content validity to the extent that a wise and thoughtful analysis of course objectives has been made in the blueprint, and care, skill, and ingenuity have been exercised in building test items to match that blueprint.

The responsible maker of a test for publication and widespread use goes to considerable pains to determine the widely accepted goals of instruction in the field in which his test is to be built. There are many types of sources to which he may, and often does, resort. These include, among others: (1) the more widely used textbooks in the field, (2) recent courses of study for the large school units, that is, states, counties, and city systems, (3) reports of special study groups, often appearing in yearbooks of one or another of the educational societies, (4) groups of teachers giving instruction in the course, (5) specialists in universities, cities, and state departments concerned with the training or supervision of teachers in the field.⁶⁷

The first step in preparing the criterion measure consisted of determining the performance objectives.

The second step consisted of examining the following textbooks in terms of the accounting cycle and the applicable portions of the respective author-prepared tests that were coordinated with each textbook:

William W. Pyle and John Arch White, Fundamental Accounting Principles (Homewood, Illinois: Richard D. Irwin, Inc., 1975).

Walter B. Meigs, A. N. Mosich, and Charles E. Johnson, Accounting: The Basis for Business Decisions (New York: McGraw-Hill Book Company, 1972).

⁶⁷Robert L. Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education (New York: John Wiley & Sons, Inc., 1969), pp. 164-165.

C. Rolin Niswonger and Philip E. Fess, Accounting Principles (Cincinnati: South-Western Publishing Co., 1973).

The third step consisted of examining the uniform accounting tests used at Virginia Polytechnic Institute and State University and those used at Virginia Western Community College.

On the basis of the performance objectives developed by the investigator, selected textbook content, three textbook-author tests, and tests administered by two colleges, the first draft of the post-achievement test was constructed. It was submitted to the following panel of judges:

Mrs. Sallie D. Branscom, accounting professor at Virginia Western Community College, author of an income tax textbook with audio tapes, who has taught accounting, business management, and secretarial science courses for 13 years.

Dr. Lawrence H. Cross, educational research professor at Virginia Polytechnic Institute and State University, author of publications on educational measurements, various types of statistical analyses, who has served as a research consultant for seven years and taught educational research for three years.

Dr. Larry N. Killough, head of the department of accounting at Virginia Polytechnic Institute and State University, author of cost and managerial accounting textbooks and related accounting publications, who has taught accounting courses for 10 years.

Mrs. Jean M. Saunders, accounting and business management professor at Virginia Western Community College, consultant in various business capacities, who has taught accounting and business administration courses for 16 years.

Dr. Jeffrey R. Stewart, Jr., head of the business education program at Virginia Polytechnic Institute and State University, author of recordkeeping, filing and records management, and related business publications, who has taught business education courses for 20 years.

Discussion with the panel of judges included content considerations as well as procedures in test construction. After the suggestions

had been incorporated in the revised test, it was administered to 171 students at Virginia Western Community College during the Fall Quarter, 1975, after the accounting cycle had been taught. All tests were scored uniformly by the investigator. A copy of the criterion achievement test is included in Appendix C.

Reliability and validity. Roscoe describes reliability and validity as each being an essential ingredient of the other. ". . . Validity is an expression of the extent to which a test measures what it is supposed to measure, reliability of how well it measures whatever it measures."⁶⁸ He suggests several ways of determining the coefficient of reliability. One is the Kuder-Richardson Formula 20, which is based on item statistics.⁶⁹ This formula is based on the rationale of "estimating reliability through determining how all items on a test relate to all other items and to the test as a whole."⁷⁰

Concerning the size of the reliability coefficient, Downie and Heath state that ". . . reliability coefficients of well-made tests tend to be high, .90 or above."⁷¹

When the Fall Quarter, 1975, criterion achievement results were analyzed, the Kuder-Richardson Formula 20 reliability estimate was .965.

⁶⁸John T. Roscoe, Fundamental Research Statistics (New York: Holt, Rinehart and Winston, Inc., 1969), pp. 101-102.

⁶⁹Ibid., pp. 105-106.

⁷⁰Ary, op. cit., p. 207.

⁷¹N. M. Downie and R. W. Heath, Basic Statistical Methods (New York: Harper and Row, 1970), p. 247.

As a result of the high coefficient of reliability, the only changes made in the instrument were clarification of instructions in two instances based on inquiries of students in the course of taking the test.

Analysis of the data. The data collected in the validation stage of this study served the following purposes, which are organized in two categories: (1) primary analyses, and (2) secondary analyses.

The primary analyses consist of the tests of the null hypotheses; the secondary analyses consist of the descriptive statistics used to reveal the nature of the data.

Evaluation techniques. The t-test for uncorrelated data with small groups and unequal observations in each group was carried out on the scores on the vocabulary ability, reading comprehension, and quantitative ability subtests of the AICPA Orientation Test to determine the comparable characteristics of the two groups.

In support of using the t-test to check equivalence when random assignment or matching cannot be accomplished, Kerlinger suggests that the researcher should take the following precautions to increase internal validity:

. . . the experimental treatments should be assigned at random. Then the similarity of the groups should be checked using any information available--sex, age, social class, and so on. The equivalence of the groups should be checked using the means and standard deviations of the pretests: t-tests and F-tests will do. The distributions should also be checked. Although one cannot have the assurance that randomization gives, if these items all check, one can go ahead with the study

knowing at least that there is no evidence against the equivalence assumption.⁷²

In order to test the hypothesis of no significant difference in the achievement of the comparison groups and to make allowances for the use of intact groups, the analysis of covariance statistic was used.

Tatsuoka described analysis of covariance as ". . . an extension of the analysis of variance to take into account the possible effects, on the dependent variable, of one or more uncontrolled variables (the covariates)."⁷³

Concerning the use of the analysis of covariance for educational research, Roscoe states:

. . . The analysis of covariance is a blending of regression and the analysis of variance, which permits statistical rather experimental control of variables.⁷⁴

SUMMARY

This chapter has been divided into a discussion of the developmental and the validation stages of this study. Although the primary objective of the study was to develop an alternate approach which would provide a flexible and effective approach to accounting instruction, the validation stage was a necessary prerequisite to evaluate the outcome.

⁷²Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1973), p. 342.

⁷³Maurice M. Tatsuoka, Multivariate Analysis: Techniques for Educational and Psychological Research (New York: John Wiley & Sons, Inc., 1971), p. 39.

⁷⁴Roscoe, op. cit., pp. 254.

The null hypotheses of the study were tested by the application of t-tests and the analysis of covariance. In addition, descriptive statistics were used to extend the findings gained from the hypothesis testing.

CHAPTER 4

ANALYSIS OF THE VALIDATION DATA

The primary purpose of this study was to develop an instructional strategy and related materials, including nine videocassette tapes, for the accounting cycle for use in the first-year college accounting course and to test the strategy through classroom implementation and evaluation.

Although the data gathered from the study were analyzed statistically, the reader should note the basis on which the data were derived. Tonne stresses the importance of stating the limitations of research in presenting the results in order that the subjective nature of the study be clearly indicated.⁷⁵ To clarify the interpretation of the data in this research project, it should be noted that intact classes were used; the investigator performed the role of the television teacher, as well as serving in the capacity of classroom teacher for both experimental sections and one of the three control sections; and the study was conducted in one community college for five weeks' duration.

The findings of the validation stage of this study are organized under the following sections and subsections:

⁷⁵Herbert A. Tonne, "The Outlook for Research in Business Education," National Business Education Yearbook, IX (National Business Education Association, 1971), p. 373.

1. Findings of the primary analysis.
 - a. Degree of equality between the two groups prior to the treatment.
 - b. Statistical analysis of the criterion achievement test after the treatment.
2. Findings of the secondary analysis.
 - a. Descriptive comparison of achievement scores by ability groups and teachers.

FINDINGS OF THE PRIMARY ANALYSIS

Degree of Equality Between the Groups

This investigation used intact classes; therefore, statistical inference is subject to considerable risk. First is the problem associated with inference to the population when probability sampling has not been used. "To support the validity of his samples with logic becomes the responsibility of the researcher."⁷⁶ Second is the problem of equivalence of groups, which cannot be assumed unless random assignment has been used. Evidence of the equivalence of the groups was determined by comparing scores on the three subtests of the AICPA Orientation Test at the outset of the study. The research reviewed indicates that this test, divided into vocabulary ability, reading comprehension, and quantitative ability, has yielded high positive correlation with measures of achievement in accounting. The groups were compared on subtests separately. Only those students who were present on the day of the pretest and posttest were included in the study.

⁷⁶Roscoe, op. cit., p. 135.

Vocabulary. The vocabulary ability subtest, consisting of 43 questions based on terms, was allocated ten minutes. It was used to test the following hypothesis:

H₀₁ There is no difference in the population mean scores associated with the experimental group and the control group as measured by the vocabulary ability scores on the pretest.

A t-test was used to determine whether the difference in the mean scores of the experimental and control groups was significant at the .01 probability level. The mean vocabulary score was 20.55 for the experimental group and 21.014 for the control group. The difference between these means was not significant at the .01 probability level; therefore, the null hypothesis above was not rejected. The summary statistics for the t-test are presented in Table 1.

Reading comprehension. The reading comprehension subtest, consisting of 12 questions based on three reading passages, was allocated five minutes. It was used to test the following hypothesis:

H₀₂ There is no difference in the population mean scores associated with the experimental group and the control group as measured by the reading comprehension scores on the pretest.

The mean reading comprehension score for the experimental group was 3.65 and for the control group was 3.411. The difference between the means was not significant at the .01 probability level; therefore, the null hypothesis above was not rejected. The summary statistics for the t-test are presented in Table 2.

Table 1

Comparison of the Experimental and Control Groups on Vocabulary Ability as Measured by the Vocabulary Subtest of the AICPA Orientation Test, Form D

| Source of variation | N | Mean | Standard deviation | Sum of squares | Degrees of freedom | Computed t |
|---------------------|----|-------|--------------------|----------------|--------------------|------------|
| Experimental | 40 | 20.55 | 7.63 | 2271.65 | | |
| Control | 73 | 21.01 | 8.83 | 5607.41 | | |
| | | | | | 111 | -.280 * |

* Not significant at the .01 probability level

Table 2

Comparison of the Experimental and Control Groups on Reading
Comprehension as Measured by the Reading Comprehension
Subtest of the AICPA Orientation Test, Form D

| Source of variation | N | Mean | Standard deviation | Sum of squares | Degrees of freedom | Computed t |
|---------------------|----|------|--------------------|----------------|--------------------|------------|
| Experimental | 40 | 3.65 | 1.67 | 109.16 | | |
| Control | 73 | 3.41 | 1.76 | 221.76 | | |
| | | | | | 111 | .704 * |

* Not significant at the .01 probability level

Quantitative ability. The quantitative ability subtest, consisting of 35 questions, was allocated 35 minutes. It was used to test the following hypothesis:

H₀₃ There is no difference in the population mean scores associated with the experimental group and the control group as measured by the quantitative ability scores on the pretest.

The mean quantitative ability score was 12.025 for the experimental group and 12.685 for the control group. The difference between the means was not significant at the .01 probability level; therefore, the null hypothesis above was not rejected. The summary statistics for the t-test are presented in Table 3.

Age. The mean age of the experimental group was 26.1 with a standard deviation of 7.5, and the mean age of the control group was 24.4 with a standard deviation of 6.0. The difference of only 1.7 years between the mean ages of the two groups suggests that the groups were very similar with respect to age.

Sex. The experimental group consisted of 67.5 percent men and 32.5 percent women; the control group, 63 percent men and 35 percent women--a difference of 4.5 percent. It appears, therefore, that the composition of the two groups was very similar with respect to gender.

Statistical Analysis of the Criterion Achievement Test

The achievement of the classes taught by the video-tutorial method and the classes taught by the lecture-demonstration method was measured by scores on a criterion-referenced post-achievement test. The test consisted of 76 questions, and the time allowed for taking

Table 3

Comparison of the Experimental and Control Groups on Quantitative Ability as Measured by the Quantitative Ability subtest of the AICPA Orientation Test, Form D

| Source of variation | N | Mean | Standard deviation | Sum of squares | Degrees of freedom | Computed t |
|---------------------|----|-------|--------------------|----------------|--------------------|------------|
| Experimental | 40 | 12.03 | 4.97 | 962.95 | | |
| Control | 73 | 12.69 | 5.79 | 2412.07 | | |
| | | | | | 111 | -.608 * |

* Not significant at the .01 probability level

the test was 50 minutes. The score for each student was the total number of correct answers out of 76; all students in the study took an identical test with the same time restriction. A copy of the achievement test is presented in Appendix C.

The achievement test was administered to 171 students during Fall Quarter, 1975, and was found to have a KR-20 Reliability Estimate of .97. The same statistic was used to analyze the post-achievement test administered during Winter Quarter, 1976, to determine the degree of consistency that existed. A KR-20 Reliability Estimate of .97 also resulted Winter Quarter, 1976, indicating a high degree of reliability and consistency for this achievement measure.

The measures on aptitude, as well as a comparison of age and sex, indicated equivalence between the comparison groups in the study; therefore, the analysis could continue as planned and the results adjusted for initial differences. The analysis of covariance was used to test the following hypotheses:

- H₀₄ There is no correlation between academic aptitude (when defined as a linear combination of scores on vocabulary ability, reading comprehension, and quantitative ability) compared with achievement as determined by scores on a teacher-made criterion-achievement test administered after the first five weeks of instruction in the first-year accounting course.
- H₀₅ There is no difference in the population mean scores associated with the experimental group taught by the video-tutorial method and the control group taught by the lecture-demonstration method as determined by scores on a teacher-made criterion-achievement test administered after the first five weeks of instruction in the first-year accounting course.

The variables used as covariates to adjust the posttest group means for initial differences were scores from the vocabulary ability,

reading comprehension, and quantitative ability subtests of the AICPA Orientation Test; the dependent variable was the criterion post-achievement test.

The analysis of covariance was computed using scores from the three independent variables--the covariates--and the dependent variable using a multivariate analysis of variance package distributed by Clyde Computing Service.⁷⁷

A summary of group means and standard deviations for the covariates and dependent variable is presented in Table 4. The group means and standard deviations on the independent variables (vocabulary ability, reading comprehension, and quantitative ability) do not vary on any one of the three covariates more than one-half point.

A preliminary test was carried out using the three covariates and one dependent variable to determine the equality of regression across groups. The results of the analysis, reported in Table 5, indicate that the relationship between a linear combination of the pretest scores and the posttest scores was not significantly different between groups. The assumption of homogeneity of regression was satisfied and the analysis of covariance was applicable.

The results of the analysis of covariance are presented in Table 6. The F ratio for regression was significant at the .001 probability level. This result indicates that regression analysis as a

⁷⁷Dean J. Clyde, Multivariate Analysis of Variance on Large Computers (Miami: Clyde Computing Service, 1969).

Table 4

Comparison of the Experimental Group and the Control Group Mean Scores
and Standard Deviations on the AICPA Orientation Test
Subtests and the Achievement Test

| Group | N | | Vocabulary ability | Reading comprehension | Quantitative ability | Achievement unadjusted | Achievement adjusted |
|--------------|----|----|-----------------------|--------------------------|-------------------------|---------------------------|-------------------------|
| Experimental | 40 | M | 20.55 | 3.65 | 12.03 | 58.78 | 58.81 |
| | | SD | 7.63 | 1.67 | 4.97 | 16.35 | |
| Control | 73 | M | 21.01 | 3.41 | 12.69 | 50.59 | 50.57 |
| | | SD | 8.83 | 1.76 | 5.79 | 21.91 | |

Table 5

Test of Equality of Regression of the AICPA Orientation Test
Subtest Scores and the Achievement Test Scores

| Source of variation | Sum of squares | Degrees of freedom | Mean square | F | Probability |
|---------------------|----------------|--------------------|-------------|------|-------------|
| Within cells | 37292.65 | 105 | 355.17 | | |
| Regression | 511.43 | 3 | 170.48 | 0.48 | 0.70 |

Table 6

Analysis of Covariance on Achievement Test Scores of the Experimental Group
and the Control Group with Vocabulary Ability, Reading
Comprehension, and Quantitative Ability as Covariates

| Source of variation | Sum of squares | Degrees of freedom | Mean square | F | Probability |
|---------------------|----------------|--------------------|-------------|------|-------------|
| Within cells | 37804.08 | 108 | 350.04 | | |
| Regression | 7190.58 | 3 | 2396.86 | 6.85 | 0.001 |
| Group difference | 1731.17 | 1 | 1731.17 | 4.95 | 0.128 |

device for adjusting group scores for initial differences and thus increasing statistical power was worthwhile--that there was a significant linear relationship between the AICPA Orientation Test, Form D, using subtest scores for vocabulary ability, reading comprehension, and quantitative ability, and achievement in accounting when a test of immediate learning is the criterion. The hypothesis of no correlation between the covariates and the achievement measure, H_{04} , was rejected.

The F ratio for treatment effect was also significant ($p=.028$). The hypothesis of no difference in population mean performance associated with the experimental and control groups, H_{05} , was rejected. The experimental group had an adjusted mean of 58.81, whereas the control group had an adjusted mean of 50.57. These adjusted means appear to be higher for the video-tutorial treatment than for the lecture-demonstration treatment; however, a further analysis of the data suggests that the teacher variable was a major contributing factor in the difference in the adjusted mean scores reported above.

FINDINGS OF THE SECONDARY ANALYSIS

In view of the relatively large difference in the achievement scores in favor of the students taught by the video-tutorial approach, the data were further analyzed to permit a better understanding of the outcomes and to reveal possible insights associated with the achievement scores of the comparative groups.

Comparison of Achievement Scores by Ability Groups and Teachers

The AICPA Orientation Test scores and the achievement scores by the five class sections are presented in Table 7. The most troublesome result is that the posttest mean scores for all three sections of the experimenter's classes were higher than the means for either of the other two classes regardless of the teaching method. Another curiosity is that Class 5 had the highest pretest mean score and the lowest posttest mean score.

The scores for the 113 students in the study were arranged from the highest to the lowest score on the pretest for the purpose of establishing three levels of ability. The high range was the top 27 percent of the 113, the middle range was the next 46 percent, and the low range was the bottom 27 percent of the distribution.

The following comparisons of unadjusted means and standard deviations are reported in Table 8:

1. The experimental group, taught by the investigator, compared with the control groups, taught by the investigator and the cooperating teachers, according to ability groups.
2. The experimental group, taught by the investigator, compared with the control section, taught by the investigator, according to ability groups.
3. The experimental group, taught by the investigator, compared with the control sections, taught by the cooperating teachers, according to ability groups.

Table 7
 Comparison of the AICPA Orientation Test
 Scores and the Achievement Test Scores
 of the Five Class Sections

| Class section | Teacher | Treatment | N | Pretest | | Posttest | |
|---------------|---------------------|--------------|----|---------|--------------------|----------|--------------------|
| | | | | mean | standard deviation | mean | standard deviation |
| 1 | Investigator | Experimental | 19 | 33.53 | 9.44 | 58.74 | 10.09 |
| 2 | Investigator | Experimental | 21 | 38.67 | 14.30 | 58.81 | 20.73 |
| 3 | Investigator | Control | 24 | 36.29 | 13.88 | 59.08 | 18.50 |
| 4 | Cooperating teacher | Control | 22 | 31.27 | 12.46 | 50.59 | 22.14 |
| 5 | Cooperating teacher | Control | 27 | 42.59 | 13.12 | 43.04 | 22.47 |

Table 8

Comparison of Achievement Scores According to Ability Groups

| Group | <u>Experimental</u> Investigator (2 classes) | <u>Control</u> Investigator (1 class) Cooperating teachers (2 classes) |
|-----------------|--|---|
| High (27%) | $\frac{N}{X} = \frac{11}{61.55}$ s = 14.89 | $\frac{N}{X} = \frac{19}{64.21}$ s = 15.76 |
| Middle (46%) | $\frac{N}{X} = \frac{16}{63.94}$ s = 9.15 | $\frac{N}{X} = \frac{37}{47.73}$ s = 22.85 |
| Low (27%) | $\frac{N}{X} = \frac{13}{50.07}$ s = 21.32 | $\frac{N}{X} = \frac{17}{41.59}$ s = 19.52 |
| Totals | $\frac{N}{X} = \frac{40}{58.78}$ s = 16.35 | $\frac{N}{X} = \frac{73}{50.59}$ s = 21.91 |

| <u>Control</u> Investigator (1 class) |
|---|
| $\frac{N}{X} = \frac{7}{69.14}$ s = 10.71 |
| $\frac{N}{X} = \frac{11}{55.73}$ s = 22.73 |
| $\frac{N}{X} = \frac{6}{53.50}$ s = 14.08 |
| $\frac{N}{X} = \frac{24}{59.08}$ s = 18.50 |

| <u>Control</u> Cooperating teachers (2 classes) |
|--|
| $\frac{N}{X} = \frac{12}{61.33}$ s = 17.87 |
| $\frac{N}{X} = \frac{26}{44.35}$ s = 22.47 |
| $\frac{N}{X} = \frac{11}{35.09}$ s = 19.47 |
| $\frac{N}{X} = \frac{49}{46.43}$ s = 22.42 |

Figures 4, 5, and 6 present the above comparisons in bar graphs. On the illustrations, I denotes the investigator and II denotes the cooperating teachers.

When all students in the study were included, as illustrated in Figure 4, the high-ability group received lower achievement scores using the video-tutorial method; those in the low- and middle-ability groups received higher achievement scores using the video-tutorial method.

When the cooperating teachers' control classes were removed from the comparison of all of the students in the study, illustrated in Figure 5, the low- and high-ability groups received lower achievement scores using the video-tutorial method; those in the middle-ability group received higher achievement scores using the video-tutorial method.

When the investigator's control class was removed from the comparison of all of the students in the study, illustrated in Figure 6, the high-ability groups received comparable achievement scores using the two treatments; those in the low- and middle-ability groups received higher achievement scores using the video-tutorial method.

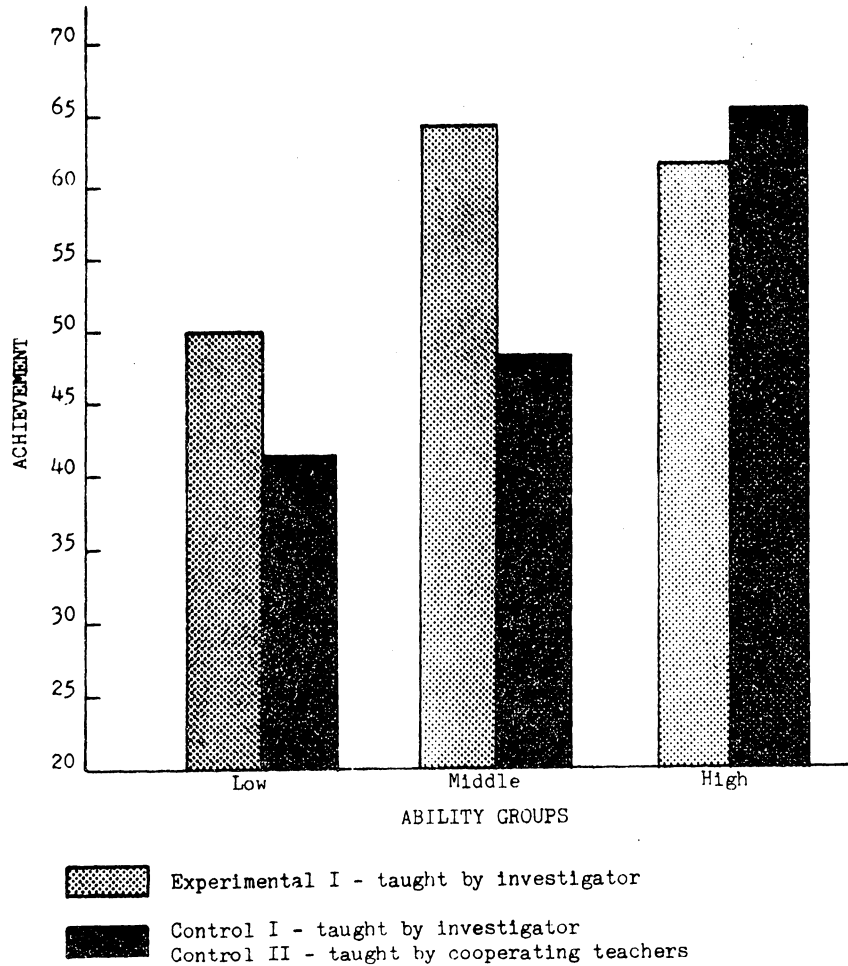


Figure 4

Comparison of Achievement Scores According to Ability Groups
Experimental Group and Control Groups I and II

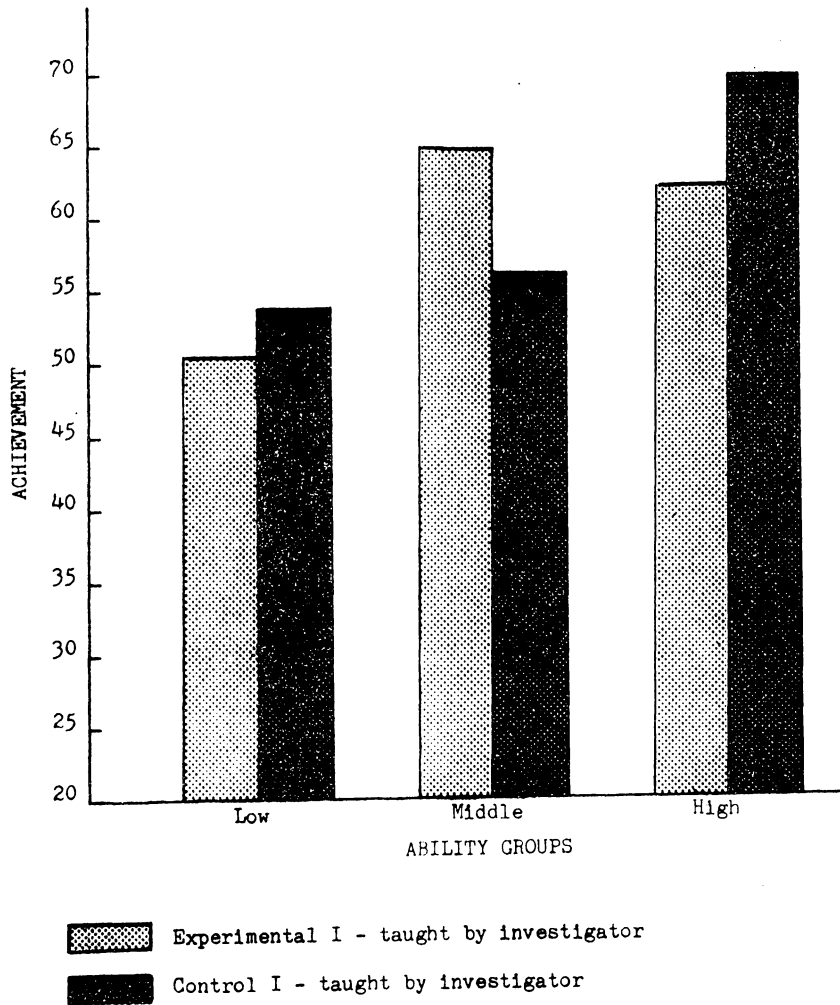


Figure 5
Comparison of Achievement Scores According to Ability Groups
Experimental Group and Control Group I

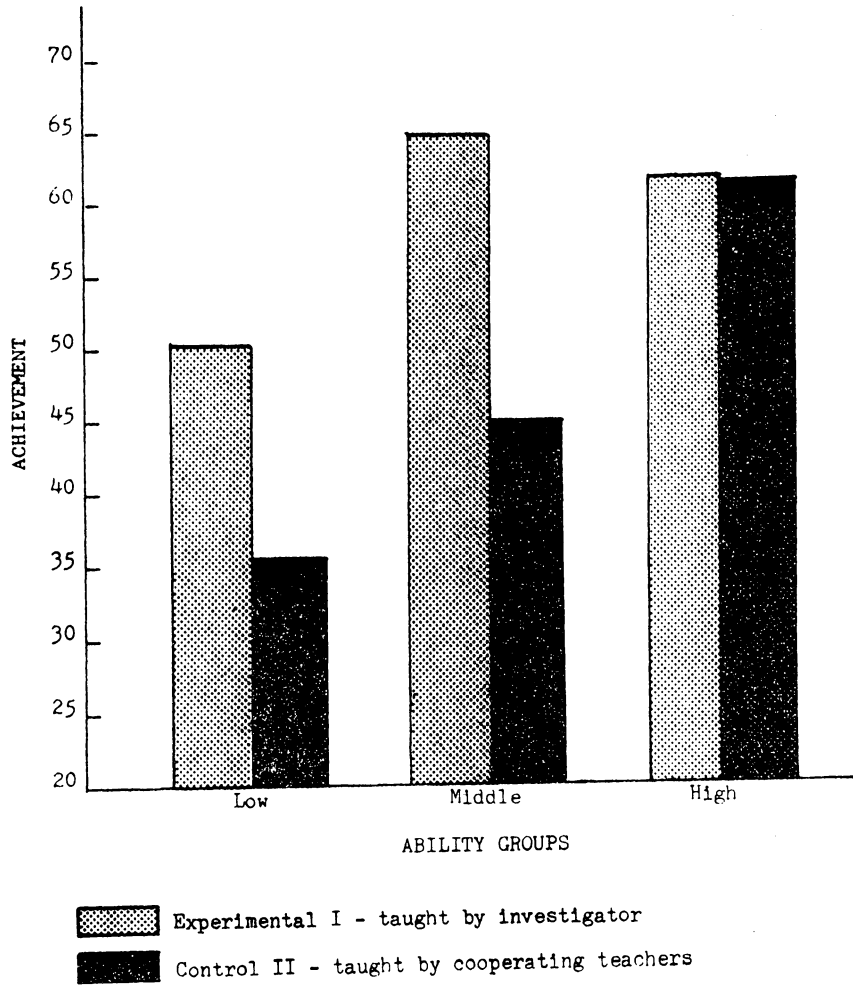


Figure 6

Comparison of Achievement Scores According to Ability Groups
Experimental Group and Control Group II

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The problem of this study was to develop and to validate through classroom implementation an alternate instructional strategy including video tapes and related materials to provide a video-tutorial approach to the teaching of first-year college accounting.

This concluding chapter is organized in the following sections and subsections:

1. Summary.
 - a. Developmental Stage.
 - b. Validation Stage.
2. Conclusions.
3. Recommendations.
 - a. Implications.
 - b. Discussion.

SUMMARY

Developmental Stage

The tapes and related materials consisted of nine investigator-prepared videocassette tapes in color and an instructional manual for the accounting cycle. The tapes and materials were designed for five weeks of instruction in the initial sequence of a first-year college accounting course that met three hours per week.

Nine tapes called modules were prepared for the following topics:

- Module 1 - Introduction to Accounting
- Module 2 - Transactions
- Module 3 - Journalizing
- Module 4 - Posting
- Module 5 - Adjusting Entries
- Module 6 - Financial Statements
- Module 7 - Closing Entries
- Module 8 - Work Sheet
- Module 9 - The Accounting Cycle

The techniques applied in the tapes and materials included a brief overview of the concepts leading up to the current topic, specific performance objectives, demonstration of concepts in stages, an opportunity to stop the tapes and apply new concepts, extensive use of visuals for clarification and emphasis, a summary at the end of each tape, and an introduction of short assignments using the related concepts.

A pilot tape was recorded, exhibited, and field tested. Suggestions and comments from students and educators were considered when the series was produced.

Validation Stage

A part of the validation stage was to compare the video-tutorial method of instruction with the lecture-demonstration method. The video-tutorial approach utilized the tapes for the initial presentation of concepts, as well as for review and make-up work; the teacher assumed the role of manager, motivator, evaluator, and tutor.

The pretest was the AICPA Orientation Test, Form D, consisting of three subtests on vocabulary ability, reading comprehension, and

quantitative ability; the posttest was constructed by the investigator, submitted to a panel of judges, revised, and field tested with a KR-20 Reliability Estimate of .97.

Data were collected from 113 college students enrolled in Principles of Accounting 211 at Virginia Western Community College, Roanoke, Virginia, Winter Quarter, 1976. Students were organized in intact classes as a result of the registration process, and teachers were assigned by the division chairman. The investigator was assigned three class sections--two were randomly assigned the video-tutorial treatment and the other class assigned the lecture-demonstration treatment--and two cooperating teachers were each assigned one class section taught by the lecture-demonstration method.

There were 40 students in the video-tutorial experimental group and 73 in the lecture-demonstration control group. The scores of the pretest and posttest were keypunched and an analysis of covariance with three covariates--vocabulary ability, reading comprehension, and quantitative ability--was carried out on scores on the achievement to compare the two groups.

Findings of the primary analysis. The following results were found from the investigation:

1. The mean scores from the AICPA Orientation Test, Form D, subtests (vocabulary ability, reading comprehension, and quantitative ability) were not significantly different for the two groups.

2. The mean age and the ratio of men and women of the two groups were very similar.

3. There was a statistically significant correlation between scores on the AICPA Orientation Test Subtests and scores on the post-achievement test administered after the first five weeks of instruction in the first-year college accounting course.

4. There was a statistically significant difference between the mean scores of the experimental group taught by the video-tutorial method and the control group taught by the lecture-demonstration method as determined by achievement scores on the post-achievement test administered after the first five weeks of instruction in the first-year college accounting course when the means were adjusted for initial differences. This result was found to be superficial when the data were further analyzed. The teacher variable was found to be the contributing factor.

Findings of the secondary analysis. The data were divided according to ability ranges and class sections and revealed the following:

1. Students in the high-ability level taught by the video-tutorial method achieved lower scores on the post-achievement test when compared with the lecture-demonstration class taught by the investigator and comparable scores when compared with lecture-demonstration classes taught by the cooperating teachers.

2. Students in the middle-ability level taught by the video-tutorial method achieved higher scores on the post-achievement test when compared with the lecture-demonstration class taught by the investigator and the lecture-demonstration classes taught by the cooperating teachers.

3. Students in the low-ability level taught by the video-tutorial method achieved slightly lower scores on the post-achievement test when compared with the lecture-demonstration class taught by the investigator and higher scores when compared with the lecture-demonstration classes taught by the cooperating teachers.

Because a factorial design was not planned and the number of students varied considerably within each treatment/aptitude combination, inferential statistics were not used to test whether the above-mentioned differences were statistically significant.

CONCLUSIONS

As a result of this investigation, conclusions were formulated which were based on the development of an alternate learning strategy and the validation of the strategy through classroom implementation. Generalizations can be made only in instructional situations and with populations similar to those in this study.

1. There is no evidence as a result of this study to believe that the video-tutorial method of instruction is superior to the lecture-demonstration method; however, neither is there any evidence to believe that the video-tutorial is not as effective as the lecture-demonstration method.

2. The AICPA Orientation Test, Form D, was an effective predictor of success in learning concepts in the first five weeks of first-year college accounting in this study.

3. Students at the community college level learned the first five weeks of first-year college accounting effectively when taught by the video-tutorial method in this study.

4. Students achieved comparable scores when taught by the video-tutorial method and the lecture-demonstration method when the television teacher and the lecture teacher was the investigator.

5. Students in the low- and middle-ability groups taught by the video-tutorial method achieved higher scores when compared with the lecture-demonstration classes taught by cooperating teachers.

RECOMMENDATIONS

These recommendations are based on the findings and experience gained by the investigator in conducting this study.

1. A study should be carried out with the same video tapes, materials, and tutorial approach with a larger group of students from a more representative population and stricter control over the variables through random assignment of students to instructional groups. If random assignment of students is not feasible, at least more groups should be used for each treatment.

2. The development of video tapes and materials should be expanded to include other concepts in the first-year college accounting course since they were found to be an effective means of providing for individual learning rates in this study.

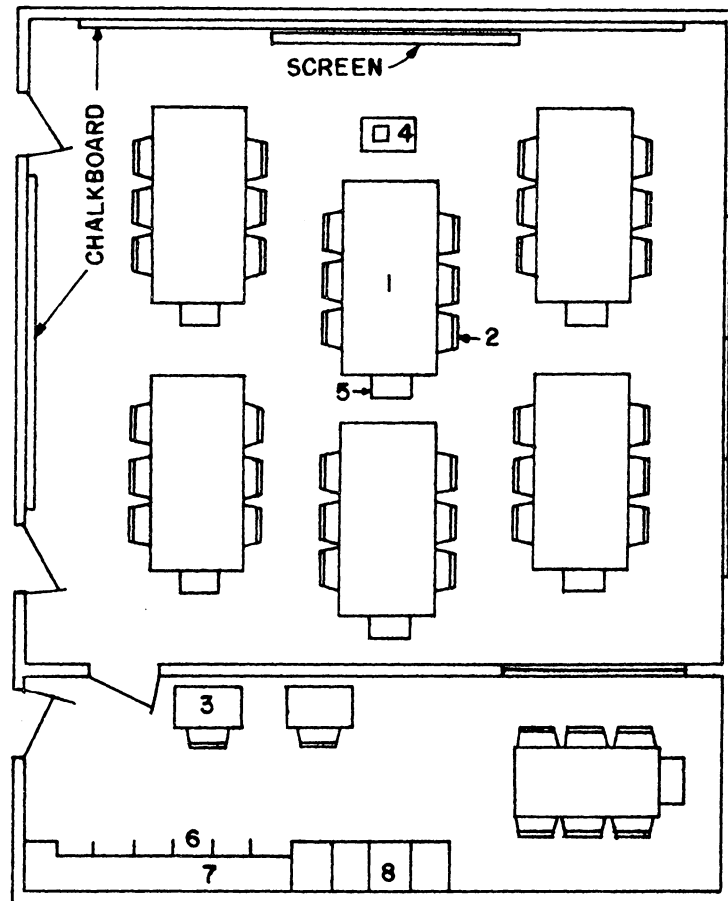
3. The video-tutorial approach should be considered for expansion to other subject areas to support or refute the findings of this investigation.

4. The physical facilities should be designed for convenience in order to encourage teachers to utilize the video-tutorial and other innovative approaches. Since classroom layout is an integral part of instructional effectiveness, a suggested floor plan based on the experience gained from this study is presented in Figure 7. Attention has been given to factors which this researcher found difficult to manage during the implementation stage. Provision has been made for storage space adjacent to the classroom for video tapes and monitor-player units and a private tutoring area separate from the classroom.

Implications

The results and conclusions of this study appear to have the following implications for future education:

1. The use of prepared video tapes in a video-tutorial approach can be an effective method of instruction in first-year college accounting.
2. The use of prepared video tapes in a video-tutorial approach can be effective in adjusting the learning environment to accommodate the individual learning rates of college students.
3. The use of prepared video tapes can be an effective supplementary aid in first-year college accounting for reinforcement of concepts and make-up work.
4. The use of prepared video tapes in a video-tutorial approach can make it possible to accommodate students in a more flexible time schedule.



LEGEND

- 1 TABLES
- 2 CHAIRS
- 3 TEACHER DESKS
- 4 DEMONSTRATION TABLE AND OVERHEAD PROJECTOR
- 5 TELEVISION MONITOR-PLAYER UNITS ON PORTABLE STANDS
- 6 STORAGE SPACE FOR MONITOR-PLAYER UNITS
- 7 STORAGE SHELVES FOR TAPES
- 8 FILING CABINETS

Figure 7

PROPOSED VIDEO-TUTORIAL ACCOUNTING LAB

Discussion

This study originated out of a concern on the part of the investigator for her students who experience difficulty achieving the objectives in accounting. The writer feels that accounting need not be as difficult to learn as the prevailing evidence tends to suggest. Based on her experience in teaching accounting at the secondary and post-secondary levels, she feels that the problem lies more in the lock-step rate, which is a recognized necessity in the lecture-demonstration method of instruction, than in the content of the subject matter.

At the outset of the study, it was felt that if presentations in accounting could be recorded of such quality that the students would be able to realize comparable benefits as those of live presentations, students could avoid the lock-step rate without sacrificing achievement. Thereby, a larger number of students could learn accounting principles effectively.

The primary purpose of this study, therefore, was directed to the planning, preparation, and use of video tapes and related materials. The author believes that just as the teacher variable has been found to have a significant effect on the effectiveness of various teaching methods, the quality of the taped presentations and materials will have a direct influence on the results of this alternative method of instruction.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Ary, Donald, Lucy Cheser Jacobs, and Asghar Razavieh. Introduction to Research in Education. New York: Holt, Rinehart and Winston, Inc., 1972.
- Baxter, Clifton Arthur. "The Effects of Computer-Augmented Instruction on Achievement in the Collegiate Principles of Accounting Course." Unpublished Doctor's dissertation, University of Georgia, 1974.
- Bigge, Morris L. Learning Theories for Teachers. New York: Harper and Row, 1964.
- Brooke, Edna Mae. "The Effectiveness of Three Techniques Used in Teaching First-Semester Accounting Principles to Technical Junior College Students." Unpublished Doctor's dissertation, Arizona State University, 1974.
- Butts, F. Eugene and Gary L. Prickett. "The Effect of Audio-Tutorial and Programmed Instruction Laboratories on Achievement in Accounting Principles." Unpublished Doctor's dissertation, Colorado State College, 1969.
- Campbell, Donald T. and Julian C. Stanley. Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally & Company, 1963.
- Carpenter, C. R. "Teleinstruction and Individualized Learning. Academy for Educational Development, Inc." Support paper for "To Improve Learning: a Report to the President and the Congress of the United States by the Commission on Instructional Technology," 1970. ERIC, ED 039 766.
- Clinton, Robert L. "New Resources for Learning," *Community and Junior College Journal*, 43:6-7, June/July, 1973.
- Clyde, Dean J. Multivariate Analysis of Variance on Large Computers. Miami: Clyde Computing Service, 1969.
- Cronbach, Lee J. and Patrick Suppes (eds.). Research for Tomorrow's Schools: Disciplines Inquiry for Education. London: The Macmillan Company Collier-Macmillan Limited, 1969.
- Cross, K. Patricia. "Occupationally Oriented Students." Prepared for a two-day conference jointly sponsored by the American Educational Publishers Institute and the American Association of Junior Colleges on Occupational-Oriented Programs in Two-Year Colleges, in Miami, Florida, December 5, 1969.

- Downie, N. and R. Heath. Basic Statistical Methods. New York: Harper and Row, 1970.
- Elliott, James Monroe. "Individualized Instruction and Personality as Factors in Accounting Performance." Unpublished Doctor's dissertation, Rutgers University, The State University of New Jersey, 1973.
- Elsea, John Edward. "A Comparison of Achievement in Elementary Accounting Between Students Taught by the Self-Paced Method and Students Taught by the Traditional Method." Unpublished Doctor's dissertation, University of Northern Colorado, 1973.
- Evans, Richard I. Resistance to Innovation in Higher Education. San Francisco: Jossey-Bass, Inc., 1968.
- Fisher, Margaret B. and Leslie F. Malpass. "A Comparison of Programmed and Standard Textbooks in College Instruction." Cooperative Research Project No. 1921, University of South Florida, 1963.
- Flaherty, Daniel Joe. "The Relative Effectiveness of Closed-Circuit Television as a Communication Medium for Instruction in Accounting." Unpublished Doctor's dissertation, Texas A&M University, 1974.
- Gagne, Robert M. "Learning Theory, Educational Media, and Individualized Instruction." Support paper for "To Improve Learning: a Report to the President and the Congress of the United States by the Commission on Instructional Technology," 1970. ERIC, ED 039 752.
- Gordon, Dennis and others. "Report of the Committee on the Junior (Community) College Curriculum," The Accounting Review, Supplement to Vol. XLVIII, 1973.
- Gropper, George L. and Arthur A. Lumsdaine, "An Experimental Evaluation of the Contribution of Sequencing, Pretesting, and Active Student Response to the Effectiveness of Programmed TV Instruction. Studies in Televised Instruction." ERIC, ED 003 649.
- Huffman, Harry and Jeffrey R. Stewart, Jr. "Assessing Classroom Activities," The Eastern Business Teachers Association Yearbook, 40:194-196. New York: The Eastern Business Teachers Association, 1967.
- Johnson, Edwin R. "A Study of Selected Social and Cultural Concomitants of Success, Persistence, and Failure of Community College Students." Journal of Business Education, 49:210, February, 1974.
- Jones, H. Milton and Vernon E. Pontius. "Survey of Accounting Teaching via Television," The Accounting Review, 40:863-866, October 1965.

- Kerlinger, Fred N. Foundations of Behavioral Research. New York: Holt, Rinehart and Winston, Inc., 1973.
- Kurland, Normand D. "Educational Technology in New York State: Theory, Practice, and the Future." Support paper for "To Improve Learning: a Report to the President and the Congress of the United States by the Commission on Instructional Technology," 1970. ERIC,
- Lauer, William Charles. "Evaluating Effectiveness of Using Business Education Department Prepared Video Tapes in the Teaching of Intermediate Typewriting at Utah State University. Unpublished Doctor's dissertation, Utah State University, 1972.
- Lundgren, Rolf. "What Is a Good Instructional Program," Quality in Instructional Television. Honolulu: The University Press of Hawaii, 1972.
- McCormick, Frank. "The New Media in Accounting Instruction: A Study of Current Thought and Practice in the University and the Public Junior College." Unpublished Doctor's dissertation, University of Iowa, 1965.
- Morrison, Sean. "Education, Communications Media and the Generation Gap," Audio-Visual Technology and Learning, 6:4, January, 1973.
- National Association for Business Teacher Education Bulletin No. 90. "Innovative Means for Renewing Business Education: Modular Scheduling, Upgraded Classes, Audio-Instructional Techniques, Computer-Assisted Instruction," 1970.
- North, Robert D. "An Evaluation of the Institute's Testing Program," The Journal of Accountancy, 107:65-67, December, 1959.
- Patton, William E., John J. Hunt, and Lyle L. Berg. "Preplanning for Individualized Instruction," Business Education Forum, 26:14-15, December, 1971.
- Popham, S. James and Kenneth A. Sirotnik. Educational Statistics: Use and Interpretation. New York: Harper & Row, Publishers, 1973.
- Roscoe, John T. Fundamental Research Statistics. New York: Holt, Rinehart and Winston, Inc., 1969.
- Saul, William Eugene. "An Experimental Study of the Effect of Computer-Augmented Instruction on Achievement and Attrition in Beginning Accounting at Miami-Dade Community College, North Campus." Unpublished Doctor's dissertation, The University of Tennessee, 1974.

- Schramm, Wilbur. Instructional Television--Promise and Opportunity.
ERIC, ED 019 848.
- _____. "What the Research Says," Quality in Instructional
Television. Honolulu: The University Press of Hawaii, 1972.
- Schultheis, Robert A. "Research Priorities for Business Education,"
The Delta Pi Epsilon Journal, 13:14, February, 1971.
- Simon, Sidney J. "Trends in Bookkeeping and Accounting Instruction in
Junior Colleges and Two-Year Community Colleges," Eastern Business
Teachers Association Yearbook, 40:288, 1967.
- Stone, Willard E. "Developments in Accounting Instruction," The
Accounting Review, 36:474-475, July, 1961.
- Tatsuoka, Maurice M. Multivariate Analysis: Techniques for Educational
and Psychological Research. New York: John Wiley & Sons, Inc.,
1971.
- Thorndike, Robert L. and Elizabeth Hagen, Measurement and Evaluation in
Psychology and Education. New York: John Wiley & Sons, Inc., 1969.
- Tonne, Herbert A. Principles of Business Education. New York: Gregg
Publishing Division, McGraw-Hill Book Company, Inc., 1961.
- _____. "The Outlook for Research in Business Education," National
Business Education Yearbook, IX, National Business Education
Association, 1971.
- _____, Estelle L. Popham, and M. Herbert Freeman. Methods of
Teaching Business Subjects. New York: Gregg Division, McGraw-Hill
Book Company, 1965.
- Wagnon, Thomas L. "A Study to Develop Microunit-Teaching Modules for
the Six Steps of the Accounting Cycle." Unpublished Doctor's
dissertation, University of Arkansas, 1974.
- Wagoner, George A. "Individualizing Instruction: When and How,"
Business Education Forum, 27:27-28, May 1973.
- Wall, Lewis E. "Focus on the Bookkeeping and Accounting Program,"
Business Education Forum, 26:11, December, 1971.
- West, Leonard J. "Experimental Research in Business Education,"
National Business Education Quarterly, 35:52, Winter, 1966-67.
- _____. "Individualization of Instruction," Business Education Forum,
25:21, May, 1971.

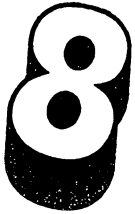
Zahn, Donald Karl. "A Study to Evaluate the Effectiveness of Audio-Tutorial, Slide/Tape Instruction Versus the Flowcharted Method of Self-Instruction in Machine Calculation." Unpublished Doctor's dissertation, University of Montana, 1972.

APPENDIX A

Instructional Manual



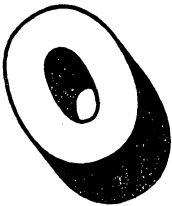
PRINCIPLES



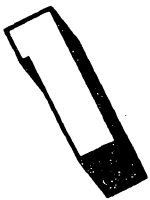
OF



ACCOUNTING



MANUAL



MODULE 1

INTRODUCTION TO ACCOUNTING

| | |
|------------------------|--|
| PERFORMANCE OBJECTIVES | Upon completion of this module, you will be able to do the following: <ol style="list-style-type: none">1. Define accounting.2. Define and give examples of principles of accounting.3. Distinguish between private and public accounting.4. Define balance sheet and explain the relationship of its elements--assets, liabilities, and owner's equity.5. Define income statement and explain the relationship of its elements--revenue and expenses.6. State the fundamental accounting equation. |
| READING FROM TEXTBOOK | Read Chapter 1 - pages 1-14. |
| VIEW MODULE 1 | |
| APPLICATION | Answer the questions on pages 1 and 2 of the <u>STUDY GUIDE</u> and check your answers with the <u>SOLUTIONS</u> . Terminology is essential to the success in accounting. Therefore, if you have difficulty answering the questions and filling in the blanks, review pages 1-14 of the textbook and/or view module 1 again. Ask your instructor to answer questions you might have concerning the material in the textbook, study guides, or application problems. |
| CONTINUE WITH MODULE 2 | |

MODULE 2

TRANSACTIONS

PERFORMANCE
OBJECTIVES

Upon completion of this module, you will be able to do the following:

1. Given transactions, recognize increases and decreases in assets, liabilities, and owner's equity including the effect of revenue and expenses on owner's equity.
2. Organize transactions in accounting equation format.
3. Prepare a balance sheet.

VIEW
MODULE 2

View Module 2 to "NOW IT'S YOUR TURN."

APPLICATION

Complete Part 11, pages 3 and 4 of the STUDY GUIDE. Check your answers with the SOLUTIONS. Using the totals of assets, liabilities, and owner's equity accounts on page 3, prepare a balance sheet on page 4A.

Start the tape again.

APPLICATION
PROBLEMS

Using forms provided in the WORKING PAPERS, complete the following problems in the textbook:

Problem 1-1A.....page 19
1-2A.....page 20
1-3A.....pages 20-21

Turn in the completed problems to your instructor as they are finished so that suggestions can be given to improve the remaining ones. They will be placed in your file folder for your reference.

CONTINUE
WITH
MODULE 3

MODULE 3

JOURNALIZING

PERFORMANCE OBJECTIVES

Upon completion of this module, you will be able to do the following:

1. Define account and t-account.
2. Define debit and credit.
3. Define journal.
4. Define journalizing.
5. Analyze transactions.
6. List the steps in journalizing.
7. Record transactions in the journal.

READING FROM TEXTBOOK

Read Chapter 2 - pages 23-44.

VIEW MODULE 3

View Module 3 to "NOW IT'S YOUR TURN."

APPLICATION

Analyze, then journalize this similar transaction:

Jack Roe invested \$1,000 to begin a new business.



GENERAL JOURNAL

| DATE | ACCOUNT TITLES AND EXPLANATION | FO- LIO | DEBIT | CREDIT |
|------|--------------------------------|------------|-------|--------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |

VIEW
MODULE 3

View the remainder of Module 3.

APPLICATION

Answer questions 1-10 on pages 5 and 6 of the STUDY GUIDE and check your answers with the SOLUTIONS.

Complete Part 11, Requirement 1 only, on pages 7 and 8 of the STUDY GUIDE and check your work with the SOLUTION.

CONTINUE
WITH
MODULE 4

MODULE 4

POSTING

| | |
|------------------------------|--|
| PERFORMANCE OBJECTIVES | <p>Upon completion of this module, you will be able to do the following:</p> <ol style="list-style-type: none"> 1. Define ledger. 2. Define posting. 3. List the steps in posting. 4. Define footing and account balance. 5. Define and state the purpose of the trial balance. |
| VIEW MODULE 4 | View Module 4 to "NOW IT'S YOUR TURN." |
| APPLICATION | Complete Part III on pages 9 and 10 of the <u>STUDY GUIDE</u> and check your work with the <u>SOLUTION</u> . |
| VIEW MODULE 4 | View the remainder of module 4. |
| APPLICATION | <p>Answer questions 11-18 on pages 6 and 7 of the <u>STUDY GUIDE</u> and check your answers with the <u>SOLUTIONS</u>.</p> <p>Complete Part II, Requirement 2 only, on pages 7-9 of the <u>STUDY GUIDE</u> and check your work with the <u>SOLUTION</u>.</p> |
| APPLICATION PROBLEMS | <p>Using forms provided in the <u>WORKING PAPERS</u>, complete the following problems in the textbook:</p> <p>Problem 2-1A.....pages 50-51 (Turn in to your instructor for approval.) 2-2A.....pages 51-52 2-3A.....page 52 (Turn in the remainder of your problems.)</p> |
| CONTINUE WITH MODULE 5 | |

MODULE 5

ADJUSTING ENTRIES

PERFORMANCE OBJECTIVES

Upon completion of this module, you will be able to do the following:

1. Define adjusting entries.
2. Define and explain the significance of the matching principle.
3. Define and give an example of a contra account.
4. Journalize and post adjusting entries.
5. List and give an example of the four types of adjustments.

READING FROM TEXTBOOK

Read Chapter 3 - pages 57-75.

VIEW MODULE 5

View Module 5 to "NOW IT'S YOUR TURN."

APPLICATION

Analyze each of the following adjusting entries in the space provided, then journalize in the general journal provided:

197A

- Dec 31 Supplies worth \$31 have now been used. (We maintain the practice of debiting all purchases of supplies to the asset account, "Supplies.")
- 31 Revenue collected in advance, \$50, which had been credited to the liability account, Unearned Fees Revenue, has now been earned.
- 31 Employees have earned \$150 which has not been recorded.
- 31 Interest revenue of \$25 has been earned on the notes receivable we hold but has not been recorded.

Supplies worth \$31 have now been used. (We maintain the practice of debiting all purchases of supplies to the asset account "Supplies.")

| | | | | | | | | | |
|----------|----------|----------|----------|-----------|----------|----------|----------|----------|----------|
| A | = | L | + | OE | (| R | C | E |) |
| | | | | | | | | | |

Revenue collected in advance, \$50, which had been credited to the liability account, Unearned Fees Revenue, has now been earned.

| | | | | | | | | | |
|----------|----------|----------|----------|-----------|----------|----------|----------|----------|----------|
| A | = | L | + | OE | (| R | C | E |) |
| | | | | | | | | | |

7

Employees have earned \$150 which has not been recorded.

| | | | | | | | | | |
|----------|----------|----------|----------|-----------|----------|----------|----------|----------|----------|
| A | = | L | + | OE | (| R | C | E |) |
| | | | | | | | | | |

Interest revenue of \$25 has been earned on the notes receivable we hold but has not been recorded.

| | | | | | | | | | |
|----------|----------|----------|----------|-----------|----------|----------|----------|----------|----------|
| A | = | L | + | OE | (| R | C | E |) |
| | | | | | | | | | |

MODULE 6

FINANCIAL STATEMENTS

| | |
|------------------------------|---|
| PERFORMANCE OBJECTIVES | <p>Upon completion of this module, you will be able to do the following:</p> <ol style="list-style-type: none"> 1. Define income statement accounts, nominal accounts, and temporary accounts. 2. Define balance sheet accounts, real accounts, and permanent accounts. 3. Prepare a classified balance sheet. 4. Define current assets, plant and equipment and intangible assets. 5. Define current liabilities and long-term liabilities. |
| VIEW MODULE 6 | View Module 6 to "NOW IT'S YOUR TURN." |
| APPLICATION | Complete Part I, Requirement 3 only, on pages 13 and 14 of the <u>STUDY GUIDE</u> and check your work with the <u>SOLUTION</u> . |
| VIEW MODULE 6 | View the remainder of Module 6. |
| APPLICATION PROBLEMS | <p>Using forms provided in the <u>WORKING PAPERS</u>, complete the following problems in the textbook:</p> <p style="padding-left: 40px;">Problem 3-2A.....pages 82-83 (Turn in to your instructor for approval.)</p> <p style="padding-left: 40px;">3-3A.....pages 83-84 (Turn in to your instructor.)</p> |
| CONTINUE WITH MODULE ? | |

MODULE 7

CLOSING ENTRIES

PERFORMANCE OBJECTIVES

Upon completion of this module, you will be able to do the following:

1. Define closing the ledger and state the two objectives.
2. Define closing entries.
3. Define post-closing trial balance.
4. List four types of closing entries.
5. Prepare closing entries.

VIEW MODULE 7

View Module 7 to "NOW IT'S YOUR TURN."

APPLICATION

T-accounts are given below to reflect the balances in the general ledger of XYZ Company. Using these account balances, plan each closing entry first in the t-accounts, then journalize in the general journal provided. (Look at the illustration again in Module 7 if you have difficulty.)

| A | = | L | + | OE | (| R | C | E |) |
|----------------------|---|-------------------------|---|--------------------------|---|---------------------------|---|---|---|
| <u>Cash</u> | | <u>Accounts payable</u> | | <u>S. Dee, capital</u> | | <u>Income summary</u> | | | |
| 1950 | | 500 | | 12000 | | | | | |
| <u>Accounts rec.</u> | | | | <u>S. Dee, withdraw.</u> | | <u>Fees earned</u> | | | |
| 500 | | | | 1500 | | 5000 | | | |
| <u>Supplies</u> | | | | | | <u>Miscellaneous exp.</u> | | | |
| 50 | | | | | | 1000 | | | |
| <u>Building</u> | | | | | | <u>Rent expense</u> | | | |
| 12,000 | | | | | | 500 | | | |

MODULE 8

WORK SHEET

| | |
|------------------------|---|
| PERFORMANCE OBJECTIVES | <p>Upon completion of this module, you will be able to do the following:</p> <ol style="list-style-type: none"> 1. Define work sheet. 2. Locate errors efficiently when the trial balance is out of balance. 3. Prepare a work sheet. |
| READING FROM TEXTBOOK | Read Chapter 4 - pages 89-109. |
| VIEW MODULE 8 | View Module 8 to "NOW IT'S YOUR TURN." |
| APPLICATION | Complete Part II, Requirement 1 only, on pages 19 and 20 of the <u>STUDY GUIDE</u> and compare your work with the <u>SOLUTION</u> . |
| VIEW MODULE 8 | View the remainder of Module 8. |
| VIEW MODULE 7 | View Module 7 again. |
| APPLICATION | <p>Answer the questions on pages 17 and 18 of the <u>STUDY GUIDE</u> and check your answers with the <u>SOLUTIONS</u>.</p> <p>Complete Part II, Requirements 2 and 3 only, on pages 19-22 of the <u>STUDY GUIDE</u> and compare your work with the <u>SOLUTION</u>.</p> |
| APPLICATION PROBLEM | <p>Using forms provided in the <u>WORKING PAPERS</u>, complete the following problem in the textbook:</p> <p style="padding-left: 40px;">Problem 4-1A.....pages 116-117 (Turn in to your instructor for approval.)</p> |
| CONTINUE WITH MODULE 9 | |

MODULE 9

THE ACCOUNTING CYCLE

PERFORMANCE OBJECTIVES

Upon completion of this module, you will be able to do the following:

1. Define post-closing trial balance.
2. List the order in which each part of the accounting cycle is completed and explain the significance of the order.
3. Prepare each requirement of the accounting cycle.

VIEW MODULE 9

APPLICATION PROBLEMS

Using forms provided in the WORKING PAPERS, complete the following problems in the textbook:

- Problem 4-3A.....page 117
4-4A.....pages 117-118
(Turn in to your instructor)

APPENDIX B

Sample Script

PRINCIPLES OF ACCOUNTINGMODULE 9ACCOUNTING CYCLE *

CARD 1

PRINCIPLES
OF
ACCOUNTING

CARD 2 AND CHARACTER GENERATOR

WITH
BETTY BOWMAN

* © 1976 by Betty Bowman

CARD 2 AND CHARACTER GENERATOR

MODULE
9
ACCOUNTING CYCLE

ACTIVITIES

1. INTRODUCTORY STATEMENT (DESK)

AFTER THE WORK SHEET HAS BEEN COMPLETED, THERE ARE PRIORITIES CONCERNING THE ORDER IN WHICH THE REMAINDER OF THE WORK IS FINISHED. THE PURPOSE OF THIS MODULE IS TO ILLUSTRATE AND EXPLAIN THESE PRIORITIES AND PROCEDURES.

2. PERFORMANCE OBJECTIVES

THESE ARE THE PERFORMANCE OBJECTIVES:

1. YOU WILL BE ABLE TO DEFINE POST-CLOSING TRIAL BALANCE.
2. YOU WILL BE ABLE TO LIST THE ORDER IN WHICH EACH PART OF THE ACCOUNTING CYCLE IS COMPLETED AND EXPLAIN THE SIGNIFICANCE OF THE ORDER.
3. YOU WILL BE ABLE TO PREPARE EACH REQUIREMENT OF THE ACCOUNTING CYCLE.

CHARACTER GENERATOR

PERFORMANCE OBJECTIVES
DEFINE POST-CLOSING TRIAL
BALANCE
LIST ORDER OF THE
ACCOUNTING CYCLE
COMPLETE ACCOUNTING CYCLE

(FOCUS ON JOURNAL)
AND
(SUPERIMPOSE WITH CHARACTER GENERATOR)

1. JOURNALIZE

EACH ACCOUNTING CYCLE IS BEGUN BY FIRST ANALYZING, THEN JOURNALIZING EACH TRANSACTION.

(FOCUS ON LEDGER)
AND
(SUPERIMPOSE WITH CHARACTER GENERATOR)

2. POST TO LEDGER

THE SECOND STEP IS TRANSFERRING EACH TRANSACTION FROM THE JOURNAL TO THE LEDGER. THIS PROCESS REQUIRES A SYSTEMATIC APPROACH TO REDUCE ERRORS. THE AMOUNT SHOULD BE WRITTEN FIRST--BECAUSE AN ERROR MADE HERE WOULD BE MORE TIME-CONSUMING TO FIND--THEN THE DATE. THE JOURNAL NUMBER IS PLACED IN THE LEDGER, AND FINALLY THE LEDGER ACCOUNT NUMBER IS TAKEN BACK TO THE JOURNAL

(FOCUS ON WORK SHEET)
AND
(SUPERIMPOSE ON CHARACTER GENERATOR)

3. WORK SHEET

THE THIRD STEP IS THE TRIAL BALANCE AND THE ANALYSIS OF THE TRIAL BALANCE--THE WORK SHEET.

(STOP TO RELOAD TRI-VU)

(FOCUS ON TEACHER)

THIS IS THE POINT AT WHICH THERE ARE DEFINITE PRIORITIES. SINCE EVERYTHING IS PLANNED ALREADY ON THE WORK SHEET, MANAGEMENT SHOULD BE GIVEN THE FINANCIAL STATEMENTS--THE INCOME STATEMENT AND THE BALANCE SHEET--AS SOON AS POSSIBLE. INTERPRETATION OF THE RESULTS OF THAT PERIOD OF OPERATIONS CAN BEGIN. TIMING IS IMPORTANT IN BUSINESS AND MANAGEMENT IS USUALLY ANXIOUS FOR THE RESULTS.

(PAUSE)

(FOCUS ON WORK SHEET)
(FOCUS ON INCOME STATEMENT)
AND
(SUPERIMPOSE WITH CHARACTER GENERATOR)

4. FINANCIAL STATEMENTS

FROM THE INCOME STATEMENT COLUMNS OF THE WORK SHEET, THE INCOME STATEMENT IS PREPARED. ALTHOUGH THE LEDGER IS NOT UP TO DATE AT THIS POINT, THE INCOME STATEMENT WILL REFLECT UP-TO-DATE BALANCES.

(FOCUS ON WORK SHEET)
 (FOCUS ON BALANCE SHEET)
 AND
 (SUPERIMPOSE WITH CHARACTER GENERATOR)
 4. FINANCIAL STATEMENTS

FROM THE BALANCE SHEET COLUMNS, . . .

(STOP TO RELOAD TRI-VU)

(FOCUS ON TEACHER)

AFTER MANAGEMENT HAS THE FINANCIAL STATEMENTS TO BEGIN ITS ANALYSES, THE ACCOUNTANT SHOULD BRING THE LEDGER UP-TO-DATA.

(FOCUS ON WORK SHEET)
 (FOCUS ON JOURNAL FOR ADJUSTING ENTRIES)
 AND
 (SUPERIMPOSE WITH CHARACTER GENERATOR)
 5. ADJUSTING ENTRIES

BEFORE THE WORK SHEET WAS PRESENTED, WE USED ANALYSIS PAPER TO LOOK COLLECTIVELY AT WHAT ACCOUNT BALANCES WERE IN THE LEDGER. NOTICE THE SAME INFORMATION ORGANIZED CONVENIENTLY IN THE INCOME STATEMENT COLUMNS OF THE WORK SHEET

(FOCUS FROM WORK SHEET)
 (FOCUS ON GENERAL JOURNAL)
 AND
 (SUPERIMPOSE WITH CHARACTER GENERATOR)
 6. CLOSING ENTRIES

(FOCUS ON TEACHER)

A CHECK NEEDS TO BE MADE AFTER THE ADJUSTING AND CLOSING ENTRIES ARE FINISHED TO MAKE SURE NO ERRORS WERE MADE IN THE PROCESS. A TRIAL BALANCE IS MADE IN PENCIL ON TWO-COLUMN PAPER--CALLED A POST OR AFTER-CLOSING TRIAL BALANCE TO PROVE EQUALITY OF DEBITS AND CREDITS BEFORE BEGINNING A NEW ACCOUNTING PERIOD.

(FOCUS ON POST-CLOSING TRIAL BALANCE)
AND
(SUPERIMPOSE WITH CHARACTER GENERATOR)
7. POST-CLOSING TRIAL BALANCE

NOTICE THAT ONLY ASSETS, LIABILITIES AND CAPITAL ARE INCLUDED. WHAT HAPPENED TO THE REVENUE AND EXPENSE ACCOUNTS? THEY WERE REDUCED TO ZERO IN THE PROCESS OF THE CLOSING ENTRIES. TEMPORARY OR NOMINAL ACCOUNTS ARE NOW REFLECTED IN CAPITAL.

(RERUN PERFORMANCE OBJECTIVES WITH DIFFERENT COLOR FOR THE BACKGROUND)

3. REVIEW THE PERFORMANCE OBJECTIVES

CAN YOU DEFINE POST-CLOSING TRIAL BALANCE?

(STOP ON THE SECOND PERFORMANCE OBJECTIVE FOR A SUMMARY)

CAN YOU LIST THE ORDER IN WHICH EACH PART OF THE ACCOUNTING CYCLE IS COMPLETED AND EXPLAIN THE SIGNIFICANCE OF THE ORDER? REMEMBER THAT AFTER THE WORK SHEET IS FINISHED, THE INCOME STATEMENT AND BALANCE SHEET COME NEXT AND THEN THE ADJUSTING AND CLOSING ENTRIES ARE JOURNALIZED AND POSTED. A POST-CLOSING TRIAL BALANCE IS THE FINAL PROOF OF THE EQUALITY OF DEBITS AND CREDITS BEFORE BEGINNING A NEW PERIOD.

CAN YOU PREPARE EACH REQUIREMENT OF THE ACCOUNTING CYCLE?

(FOCUS ON TEACHER)

YOU ARE NOW READY TO DO A COMPLETE ACCOUNTING CYCLE--RELATIVELY INDEPENDENT OF TEXTBOOK ILLUSTRATIONS--I HOPE.

GOOD LUCK!

CARD 3

END MODULE
PLEASE REWIND

APPENDIX C

Criterion-Referenced Achievement Test

NAME _____

ACCOUNTING 211

Section _____

DATE _____

CHAPTERS 1-4

PART I - TERMINOLOGY AND PRINCIPLES

INSTRUCTIONS: Complete each of the following statements by writing the appropriate words in the Answers column.

| QUESTIONS | ANSWERS | SCORING |
|--|---------|-----------|
| 1. The word "equities" in accounting refers to the owner's equity and the _____ | _____ | 1. _____ |
| 2. A general ledger is a book containing all of the accounts of a business that appear on the balance sheet and the _____ | _____ | 2. _____ |
| 3. Real or permanent accounts appear on the _____ prepared by businesses at the end of each accounting period..... | _____ | 3. _____ |
| 4. Building is classified as a/an _____ asset on the balance sheet..... | _____ | 4. _____ |
| 5. A general term applied to the group of accounts that are closed at the end of the fiscal period is..... | _____ | 5. _____ |
| 6. After the work sheet has been completed, the next step in the accounting cycle is _____ | _____ | 6. _____ |
| 7. Nominal or temporary accounts appear on which of the two statements commonly prepared by businesses at the end of the accounting period. | _____ | 7. _____ |
| 8. Prepaid insurance is classified as a/an _____ asset on the balance sheet..... | _____ | 8. _____ |
| 9. If the credit portion of a \$200 transaction is incorrectly posted to the ledger as a debit (assume no other errors), the trial balance totals will differ by _____ | _____ | 9. _____ |
| 10. The term used to refer to an account which has the opposite kind of balance from the normal balance for that classification of account is . | _____ | 10. _____ |
| 11. The accounting equation is stated as follows .. | _____ | 11. _____ |
| 12. Every transaction must change a minimum of how many accounts .. | _____ | 12. _____ |
| 13. The process of transferring transactions from the journal to the ledger is called _____ | _____ | 13. _____ |
| 14. The final step in the accounting cycle is the preparation of a _____ before starting a new accounting cycle .. | _____ | 14. _____ |
| 15. Accrued revenue at the end of the period involves a debit to a _____ account and a credit to a revenue account .. | _____ | 15. _____ |

PART II - JOURNALIZING

INSTRUCTIONS: Be guided by the explanations in journalizing the following transactions. Use appropriate account titles. Extra lines may be provided; use only those you feel are needed. The accounts you decide to debit and credit should appear above the explanations.

| 19 75 | | GENERAL JOURNAL | SCORING | |
|-------|---|---|----------|----------|
| | | | Debit | Credit |
| Dec | 1 | | | |
| | | Ron Johnson invested \$12,000 in cash and office equipment with a fair market value of \$3,000 to establish a real estate agency. | 16. ____ | 17. ____ |
| | 2 | | | |
| | | Purchased \$100 worth of office supplies on credit. | 18. ____ | 19. ____ |
| | 3 | | | |
| | | Paid \$300 for three months' rent. | 20. ____ | 21. ____ |
| | 4 | | | |
| | | Received \$500 commission for selling a house. | 22. ____ | 23. ____ |
| | 5 | | | |
| | | Paid \$50 of the amount owed as a result of the purchase of supplies on December 2. | 24. ____ | 25. ____ |
| | 6 | | | |
| | | Sold a house with a commission of \$400 which should be received within 30 days. | 26. ____ | 27. ____ |
| | 7 | | | |
| | | Received \$ 200 partial payment for selling the house on December 6. | 28. ____ | 29. ____ |
| | 8 | | | |
| | | Paid \$25 for a newspaper advertisement. | 30. ____ | 31. ____ |

GENERAL JOURNAL

SCORING

| 1975 | | | Debit | Credit |
|------|----|--|-------|--------|
| Dec | 9 | | | |
| | | Paid \$200 to owner, Ron Johnson, for his personal use. | 32. | 33. |
| | 10 | | | |
| | | Recorded the adjusting entry for supplies. An inventory of the supplies on hand was found to be \$30. (Refer to the entry on December 2.) | 34. | 35. |
| | 11 | | | |
| | | Recorded the adjusting entry for depreciation of the office equipment. The estimated depreciation was \$200. | 36. | 37. |
| | 12 | | | |
| | | Recorded the adjusting entry for \$150 earned by the secretary, but unpaid and unrecorded on the last day of the accounting period. | 38. | 39. |
| | 13 | | | |
| | | Recorded the adjusting entry for \$100 of revenue collected in advance (originally credited to Unearned commissions revenue, a liability) which has now been earned. | 40. | 41. |
| | 14 | | | |
| | | | 42. | 43. |
| | | | 44. | 45. |
| | | | 46. | 47. |
| | | | 48. | 49. |
| | | From the work sheet you complete in Part III, prepare the necessary closing entries. | | |

PART III - WORK SHEET

INSTRUCTIONS: The following adjusted trial balance is arranged alphabetically, rather than in the normal order. Extend each item to the proper column and complete the work sheet.

RON JOHNSON REAL ESTATE AGENCY
 Work Sheet
 For the year ended December 31, 1975

| | Adjusted Trial Balance | Income Statement | | Balance Sheet | | SCORING |
|-------------------------------------|------------------------|------------------|--------|---------------|--------|-----------|
| | | Debit | Credit | Debit | Credit | |
| Accounts payable | 2 | | | | | 50. _____ |
| Accounts receivable | 2 | | | | | 51. _____ |
| Accumulated depreciation, equipment | 1 | | | | | 52. _____ |
| Advertising expense | 1 | | | | | 53. _____ |
| Cash | 3 | | | | | 54. _____ |
| Commissions earned | 8 | | | | | 55. _____ |
| Depreciation expense, equipment | 1 | | | | | 56. _____ |
| Prepaid rent | 2 | | | | | 57. _____ |
| Office equipment | 5 | | | | | 58. _____ |
| Ron Johnson, capital | 8 | | | | | 59. _____ |
| Ron Johnson, withdrawals | 2 | | | | | 60. _____ |
| Salaries expense | 2 | | | | | 61. _____ |
| Salaries payable | 1 | | | | | 62. _____ |
| Supplies | 1 | | | | | 63. _____ |
| Supplies expense | 1 | | | | | 64. _____ |
| | | | | | | 65. _____ |
| | | | | | | |
| | | | | | | |
| | | | | | | |

APPENDIX D

Data for Experimental Group

Data for Experimental Group
Class Section 1

| Subject | | | AICPA Orientation Test | | | Posttest |
|-------------|-----|-----|------------------------|-----------------------|----------------------|---------------------------------------|
| Case number | Age | Sex | Vocabulary ability | Reading comprehension | Quantitative ability | Criterion-referenced achievement test |
| 1 | 20 | M | 11 | 3 | 9 | 61 |
| 2 | 20 | M | 17 | 4 | 9 | 42 |
| 3 | 20 | F | 22 | 6 | 12 | 66 |
| 4 | 26 | M | 17 | 5 | 11 | 64 |
| 5 | 31 | M | 18 | 4 | 13 | 52 |
| 6 | 20 | M | 29 | 6 | 17 | 71 |
| 7 | 19 | M | 13 | 2 | 10 | 55 |
| 8 | 30 | M | 24 | 4 | 16 | 43 |
| 9 | 19 | F | 11 | 5 | 8 | 61 |
| 10 | 22 | M | 14 | 4 | 7 | 60 |
| 11 | 24 | M | 13 | 3 | 13 | 52 |
| 12 | 18 | F | 17 | 0 | 8 | 72 |
| 13 | 19 | M | 14 | 4 | 5 | 61 |
| 14 | 24 | M | 22 | 3 | 15 | 69 |
| 15 | 30 | M | 14 | 2 | 8 | 42 |
| 16 | 19 | M | 23 | 3 | 20 | 49 |
| 17 | 20 | F | 28 | 6 | 14 | 55 |
| 18 | 19 | F | 24 | 3 | 13 | 72 |
| 19 | 24 | M | 21 | 3 | 7 | 69 |

Data for Experimental Group
Class Section 2

| S u b j e c t | | | AICPA Orientation Test | | | Posttest |
|---------------|-----|-----|------------------------|-----------------------|----------------------|---------------------------------------|
| Case number | Age | Sex | Vocabulary ability | Reading comprehension | Quantitative ability | Criterion-referenced achievement test |
| 1 | 30 | M | 24 | 5 | 7 | 65 |
| 2 | 25 | F | 22 | 4 | 17 | 76 |
| 3 | 39 | F | 22 | 3 | 11 | 74 |
| 4 | 26 | F | 7 | 1 | 8 | 75 |
| 5 | 25 | M | 22 | 3 | 17 | 72 |
| 6 | 29 | M | 27 | 4 | 11 | 63 |
| 7 | 23 | F | 40 | 5 | 11 | 74 |
| 8 | 20 | M | 12 | 2 | 13 | 24 |
| 9 | 21 | F | 29 | 6 | 17 | 75 |
| 10 | 20 | M | 13 | 2 | 5 | 57 |
| 11 | 22 | M | 20 | 6 | 16 | 54 |
| 12 | 36 | F | 35 | 5 | 19 | 69 |
| 13 | 27 | F | 16 | 2 | 10 | 71 |
| 14 | 37 | M | 25 | 4 | 11 | 68 |
| 15 | 33 | M | 37 | 5 | 24 | 61 |
| 16 | 37 | M | 16 | 0 | 6 | 10 |
| 17 | 17 | M | 13 | 5 | 7 | 60 |
| 18 | 40 | M | 31 | 6 | 11 | 32 |
| 19 | 50 | F | 14 | 2 | 5 | 13 |
| 20 | 30 | M | 17 | 1 | 15 | 70 |
| 21 | 28 | M | 28 | 5 | 25 | 72 |

APPENDIX E

Data for Control Group

Data for Control Group
Class Section 3

| S u b j e c t | | | AICPA Orientation Test | | | Posttest |
|---------------|-----|-----|------------------------|-----------------------|----------------------|---------------------------------------|
| Case number | Age | Sex | Vocabulary ability | Reading comprehension | Quantitative ability | Criterion-referenced achievement test |
| 1 | 23 | M | 20 | 0 | 16 | 70 |
| 2 | 22 | M | 37 | 2 | 25 | 75 |
| 3 | 23 | M | 33 | 4 | 16 | 76 |
| 4 | 19 | F | 11 | 2 | 8 | 51 |
| 5 | 24 | M | 20 | 6 | 12 | 33 |
| 6 | 41 | F | 33 | 4 | 7 | 69 |
| 7 | 21 | F | 8 | 4 | 11 | 64 |
| 8 | 19 | F | 17 | 2 | 9 | 67 |
| 9 | 30 | M | 19 | 3 | 10 | 23 |
| 10 | 30 | M | 21 | 3 | 12 | 75 |
| 11 | 24 | M | 33 | 5 | 20 | 46 |
| 12 | 17 | F | 20 | 4 | 9 | 9 |
| 13 | 19 | M | 11 | 6 | 8 | 61 |
| 14 | 33 | M | 6 | 0 | 7 | 45 |
| 15 | 20 | F | 9 | 2 | 5 | 69 |
| 16 | 20 | F | 21 | 4 | 9 | 64 |
| 17 | 20 | F | 18 | 3 | 7 | 71 |
| 18 | 19 | F | 9 | 2 | 11 | 31 |
| 19 | 22 | M | 17 | 2 | 10 | 69 |
| 20 | 42 | F | 22 | 5 | 14 | 64 |
| 21 | 22 | M | 21 | 2 | 18 | 68 |
| 22 | 24 | M | 38 | 4 | 18 | 68 |
| 23 | 19 | F | 24 | 5 | 14 | 74 |
| 24 | 29 | F | 30 | 5 | 18 | 76 |

Data for Control Group
Class Section 4

| S u b j e c t | | | AICPA Orientation Test | | | Posttest |
|---------------|-----|-----|------------------------|-----------------------|----------------------|---------------------------------------|
| Case number | Age | Sex | Vocabulary ability | Reading comprehension | Quantitative ability | Criterion-referenced achievement test |
| 1 | 19 | F | 21 | 2 | 6 | 9 |
| 2 | 25 | F | 21 | 5 | 12 | 71 |
| 3 | 31 | F | 23 | 5 | 6 | 68 |
| 4 | 23 | M | 22 | 4 | 8 | 59 |
| 5 | 19 | M | 7 | 0 | 5 | 14 |
| 6 | 20 | M | 32 | 5 | 12 | 69 |
| 7 | 18 | F | 21 | 1 | 18 | 75 |
| 8 | 23 | F | 20 | 5 | 11 | 62 |
| 9 | 21 | M | 25 | 6 | 18 | 22 |
| 10 | 20 | F | 16 | 4 | 14 | 71 |
| 11 | 22 | M | 23 | 2 | 7 | 64 |
| 12 | 19 | M | 12 | 1 | 11 | 48 |
| 13 | 18 | M | 8 | 2 | 9 | 26 |
| 14 | 28 | M | 17 | 4 | 15 | 70 |
| 15 | 20 | M | 18 | 3 | 7 | 61 |
| 16 | 29 | M | 39 | 6 | 18 | 74 |
| 17 | 19 | M | 5 | 3 | 13 | 27 |
| 18 | 19 | F | 5 | 2 | 3 | 15 |
| 19 | 19 | F | 14 | 1 | 7 | 35 |
| 20 | 20 | M | 12 | 4 | 5 | 51 |
| 21 | 47 | F | 13 | 3 | 6 | 57 |
| 22 | 29 | M | 16 | 4 | 15 | 65 |

Data for Control Group
Class Section 5

| S u b j e c t | | | AICPA Orientation Test | | | Posttest |
|---------------|-----|-----|------------------------|-----------------------|----------------------|---------------------------------------|
| Case number | Age | Sex | Vocabulary ability | Reading comprehension | Quantitative ability | Criterion-referenced achievement test |
| 1 | 19 | F | 20 | 5 | 16 | 41 |
| 2 | 20 | M | 23 | 3 | 16 | 12 |
| 3 | 25 | F | 20 | 6 | 7 | 24 |
| 4 | 19 | M | 30 | 4 | 29 | 50 |
| 5 | 25 | M | 28 | 4 | 26 | 72 |
| 6 | 19 | M | 18 | 2 | 12 | 42 |
| 7 | 27 | M | 36 | 5 | 12 | 65 |
| 8 | 25 | F | 19 | 0 | 6 | 3 |
| 9 | 26 | M | 15 | 2 | 5 | 49 |
| 10 | 27 | M | 41 | 5 | 16 | 73 |
| 11 | 24 | F | 41 | 7 | 19 | 75 |
| 12 | 27 | M | 17 | 3 | 19 | 27 |
| 13 | 24 | M | 31 | 6 | 10 | 62 |
| 14 | 30 | M | 23 | 1 | 9 | 15 |
| 15 | 27 | M | 27 | 1 | 16 | 31 |
| 16 | 25 | M | 17 | 2 | 22 | 30 |
| 17 | 32 | M | 17 | 3 | 13 | 73 |
| 18 | 27 | F | 36 | 4 | 30 | 76 |
| 19 | 27 | M | 14 | 2 | 15 | 41 |
| 20 | 26 | M | 19 | 1 | 12 | 23 |
| 21 | 23 | M | 17 | 7 | 17 | 50 |
| 22 | 30 | F | 21 | 4 | 9 | 36 |
| 23 | 35 | M | 21 | 3 | 14 | 4 |
| 24 | 25 | M | 33 | 5 | 22 | 67 |
| 25 | 37 | M | 22 | 4 | 12 | 42 |
| 26 | 23 | M | 14 | 3 | 13 | 23 |
| 27 | 20 | M | 26 | 6 | 9 | 56 |

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A VIDEO-TUTORIAL APPROACH TO THE
TEACHING OF ACCOUNTING

by

Betty Rakes Bowman

(ABSTRACT)

The development and validation of a video-tutorial approach to the teaching of accounting was the problem of this study. The purpose was to provide an alternate approach which might lead to a more flexible method of instruction that would accommodate varying learning rates of students in accounting.

The first phase of the study was the developmental stage. Nine videocassette tapes in color and an instructional manual were prepared by the investigator for the first five weeks of instruction in first-year college accounting. The course content for the study was the accounting cycle which was divided into nine major units. A video tape or module was prepared for each unit featuring a brief overview of the concepts leading up to the current topic, specific performance objectives, a visual demonstration and illustration of each new concept, an opportunity to stop the tape and apply new concepts, extensive use of visuals for clarification and emphasis, a summary at the end of each tape, and an introduction of assignments using the related concepts. The objective was to record presentations that would be of such quality that the student would be able to realize comparable benefits of live presentations--but only when the previous objectives had been met.

The second phase of the study was the validation stage consisting of the implementation and evaluation of the video-tutorial approach developed by the investigator. The strategy required the teacher to assume the role of manager, motivator, evaluator, and tutor in the classroom. Five 4' by 8' tables were used in the accounting classroom to accommodate six students at a table. A portable stand equipped with a monitor-player unit, a copy of each of the nine tapes, and six headsets was placed at the end of each table. The students worked cooperatively in groups receiving help from the teacher either individually, in small groups, or as a class according to the needs of the students.

The study included 113 community college students in five intact class sections registered for Principles of Accounting. Of the three classes assigned to the investigator, two received video-tutorial experimental treatment and one received lecture-demonstration control treatment. Two cooperating teachers were each assigned one class which received the lecture-demonstration control treatment. The experimental group included 40 students taught by the investigator. The control group included 24 students taught by the investigator and 49 taught by the cooperating teachers. The AICPA Orientation Test was administered on the first class meeting and the three subtest scores were used as covariates to adjust the groups for initial differences. An investigator-prepared criterion-achievement test was used as the dependent variable. An analysis of covariance indicated that there was a significant difference in the two treatments in favor of the video-tutorial approach; however, a further analysis of the data revealed that the teacher variable

was the major factor contributing to the difference rather than the treatment.

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 the lecture-demonstration method; however, neither is there any evidence to believe that the video-tutorial is not as effective as the lecture-demonstration method.