DEVELOPMENT OF SIMULATED EXPERIENCES TO MEASURE APPLICATION OF WOMEN'S WEAR LINE AND DESIGN PRINCIPLES

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CHAPTER I

INTRODUCTION

In the field of education, many first-rate scholars are turning their attention to the study of educational evaluation as a field of disciplined inquiry. As Popham (1974) noted, several capable people are choosing educational evaluation as their area of professional specialization. Educators must now ask themselves where they stand in their understanding of the evaluative process. According to Cahen (Grobman, 1968), questions which educators should be asking include: Where are we going? What roles will evaluation be asked to play in future innovation activities? Do we know enough about evaluation to intelligently develop procedures for training the evaluators of the future?

Educators have developed a taxonomy which provides a classification of educational objectives. Within this taxonomy is the cognitive domain which is, as Bloom (1956) stated, most central to the work of much current test development. The cognitive domain includes six major classes: knowledge, comprehension, application, analysis, synthesis, and evaluation. Knowledge represents the lowest level and evaluation the highest level.

Knowledge, being the lowest level in the cognitive domain, simply involves the recall or recognition of facts in a way very

similar to that in which they were originally presented. Comprehension, following the knowledge level in the hierarchy of the cognitive domain, involves the interpretation of facts, the ability to make some use of the material or ideas being communicated. But higher and more significant than comprehension is application. Bloom (1956) described application as the ability of a student to apply or use appropriate abstractions in new situations without having to be shown how to use them in those situations. However, according to Horrocks (1946), it is questionable whether knowledge of fact and principle leads to effective or intelligent application of fact and principle.

Be that as it may, the ultimate goal of education, that is, in the cognitive domain, is positive transfer evidenced by effective application of previous learning. Although it is generally agreed that application is important, Park (1975) stated the application category received the least attention of any of Bloom's categories in the cognitive domain. Nevertheless, what appears to be desirable are studies that yield evidence that not only does a program teach, but that students can transfer their learning beyond the immediate context of the program (Ellis, 1965).

As a means of accomplishing this objective, Beck and Monroe (1969) suggested simulation be used, that is, the procedure in which a model of a real situation or an analogy to it is created for the purpose of testing or teaching. Simulation is often used to provide a learning environment that represents a life situation for training or transfer. Simulations are considered to be a satisfactory way to

test both the acquisition of knowledge and its application in a realistic situation (Gibbs, 1974). Visuals, such as slides, are one means by which simulated experiences may be provided.

Purposes of the Study

The purposes of this investigation were to develop an instrument to measure the ability of students to make application of knowledge pertaining to selected women's wear line and design principles, and to study the relationship among the students' knowledge levels, the students' application levels and selected factors in the students' backgrounds.

Objectives

1. To develop a simulated activity which measures students' application levels pertaining to the use of line and design principles in the selection of women's clothing.

2. To measure the knowledge levels and the application levels of students pertaining to women's wear line and design principles.

3. To study the relationship between students' knowledge levels and their application levels pertaining to women's wear line and design principles and to consider selected factors in the students' backgrounds.

4. To make recommendations for revision of the simulated activity.

Hypotheses

It was hypothesized that there would be no significant correlation between the following:

1. Module I Posttest Scores and Simulated Activity Scores.
2. Module II Posttest Scores and Simulated Activity Scores.
3. Module I Gain Scores and Simulated Activity Scores.
4. Module II Gain Scores and Simulated Activity Scores.

Background of the Study

For purposes of this study, a learning package related to women's wear line and design principles was used. The learning package was selected from a series developed in a research project at Oklahoma State University entitled "An Exploratory Study of Administrative Barriers to Installation of Open Entry-Exit Work Experiences in Cooperative Clothing Retailing Programs" (Greenwood & Pestle, 1977). The research project was funded by the United States Office of Education. The director of the project was Dr. Kathryn M. Greenwood and the co-director was Dr. Ruth E. Pestle.

In the Greenwood and Pestle research, learning packages were prepared using competency based objectives in the area of clothing and textiles merchandising. These learning packages served as instructional materials to test the use of the open entry-exit concept in cooperative work programs. The learning packages were tested during the fall of 1976. High school students and adults in Oklahoma City and Tulsa, Oklahoma, participated in the pilot study.

The learning package used for purposes of this study was entitled Suitability for Customer. This learning package consisted of two modules: Module I, Basic Principles of Line and Design; and Module II, Women's Wear Line and Design. These two modules were used to develop the simulated activity which measured students' application levels.

Basic to the learning package was its readability, an indicator of the ease of understanding or comprehension of the materials. For purposes of this study, Module I and Module II were tested for readability by the Flesch (1951) readability formula. The readability for both modules was found to be at the eigth-ninth grade level. The sample for this study included eleventh and twelfth grade students.

Assumptions

The following assumptions underlie the study:

1. Cognitive knowledge related to line and design principles can be applied to selling women's wear.

2. Simulated activity scores can be used to evidence the students' application levels.

3. Pretest, posttest and gain scores can be used to evidence the students' knowledge levels.

Limitations of the Study

1. The sample was limited to 23 female students enrolled in distributive education at C. E. Donart High School, Stillwater, Oklahoma, spring, 1977.

2. Only information related to selected line and design principles was measured in the simulated activity.

3. Only information pertaining to selling women's dresses, coats and sportswear was included in the simulated activity.

Definition of Terms

1. Cognitive Domain--the portion of the educational taxonomy which includes those objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills (Bloom, 1956, p. 7). This domain includes six major classes: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, p. 18).

2. Knowledge Level--the lowest class within the cognitive domain which includes those behaviors and test situations which emphasize the remembering, either by recognition or recall, of ideas, material or phenomena (Bloom, 1956, p. 62). For purposes of this study, the students' pretest, posttest and gain scores were used as evidence of the students' knowledge levels pertaining to selected women's wear line and design principles.

3. Application Level--the ability to use learned material in a new situation (Bloom, 1956, p. 120). For purposes of this study, the students' scores on the simulated activity were used as evidence of their ability to apply line and design principles in the selection of women's clothing.

4. Positive Transfer--an experience or performance on one task which aids or facilitates performance on a second task (Ellis, 1965, p. 3).

5. Individualized Learning--the acquisition of knowledge and skills by the student through the use of self-paced learning materials

which incorporate self-instructional methods and self-evaluative techniques (Greenwood & Pestle, 1977, p. 5).

6. Learning Package--a unique curricular vehicle which serves to guide students in their own learning. The learning package permits the students to learn at their own rate, allowing alternative ways of achieving stated behavioral objectives. It also provides for individual differences in ability and for successful learning experiences at varying levels of self-initiative and self-direction (Kapfer & Ovard, 1971, p. iii).

7. Modules--the individualized learning materials within each learning package designed for students to use in the classroom. Each module included an introduction, performance objectives, information sheets, key to symbols, in-class activities, pretests and posttests.

8. Line and Design Principles--the elements of line, color and texture. For purposes of this study, these principles were considered in relation to women's wear only.

9. Readability--the ease of understanding or interest value due to the style of writing (Klare, 1963, p. 1, Flesch, 1951, p. 1). For purposes of this study, it refers only to the ease of comprehension or understanding.

10. Pretest--an evaluation instrument which measures the entry behaviors of students in terms of their prior knowledge of instructional package objectives (Frantz, 1974, p. 9).

11. Posttest--an evaluation instrument which measures the terminal performance of students after completing an instructional module (Frantz, 1974, p. 9).

12. Gain Score--the difference between each students' pretest score and posttest score. A student who has a lower posttest score than pretest score has a negative gain.

13. Simulation--a procedure in which a model of or an analog to a real situation is created for the purpose of testing or teaching (Beck & Monroe, 1969, p. 45).

14. Simulated Activity--the evaluation instrument used to measure the students' ability to apply line and design principles in the selection of women's clothing. The activity included simulated selling situations and a series of 35 mm slides.

CHAPTER II

REVIEW OF LITERATURE

Introduction

As early as 1946, it was recognized that the relationship between knowledge of facts and principles and the ability to apply those facts and principles posed a pressing question in education (Horrocks, 1946). Today educators are still interested in this relationship.

Our western culture has been responsible for organizing a large number of institutions in order to train both children and adults, on the presumption that such training will carry over and be of benefit in solving problems in everyday life (Hall, 1966). However, students do not always apply what they have learned. In fact, surprisingly little relationship has been found between intelligence and performance in learning tasks (Frederiksen, 1969).

Be that as it may, an effective use of previous learning, an example of positive transfer, is the desired goal of education. According to Jamieson (1973), positive transfer is more likely to take place when the learning situation has a great degree of similarity to the subsequent performance situation. Simulation may be employed to create this realistic learning situation.

The review of literature was organized into the following seven major topics: educational taxonomies, transfer of learning, learning packages, readability, simulation, visual evaluation, and related research.

Educational Taxonomies

Taxonomies have been developed which permit a classification of educational objectives. The cognitive and experiential domains are two examples of educational taxonomies.

Cognitive Domain

The cognitive domain includes those objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills (Bloom, 1956). Much of the work in curriculum development has taken place within the cognitive domain.

Six major classes are included in the cognitive domain: knowledge, comprehension, application, analysis, synthesis, and evaluation. These classes are arranged in a hierarchy, with knowledge being the simplest and evaluation the most complex. According to Bloom (1956), the objectives in one class are likely to make use of and be built on the objectives in the preceding classes. Bloom explained that evidence is not conclusive, but that there is a trend confirming a hierarchy of classes of behavior which supports the present classification of these behaviors.

Gronlund (1971, p. 528) presented a condensed version of Bloom's major categories in the cognitive domain. The condensed version of

the first three categories included:

1. Knowledge. Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest of learning outcomes in the cognitive domain.

2. Comprehension. Comprehension is defined as the ability to grasp the meaning of material. This may be shown by transplanting material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.

3. Application. Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.

Comprehension is assumed to include the behavior at the knowledge level, while application includes the behavior at both the knowledge and comprehension levels. Educators have recognized the need to insure mastery of higher level thinking ability, as simple recall is not enough. Miller and Williams (1973) emphasized that students must learn to apply knowledge appropriately in solving problems, along with other abilities in higher level thinking. However, as Miller and Williams stated, little attention has been given to developing and disseminating techniques for constructing test questions which require higher level thinking ability.

Experiential Domain

Steinaker and Bell (1975) proposed a new taxonomy, the experiential domain, which consists of five major classes: exposure,

participation, identification, internalization, and dissemination. In relation to the cognitive domain, the experiential domain makes explicit a possible sequence of classroom activities which will bring students to the highest level of the cognitive domain. Knowledge and comprehension of the cognitive domain require exposure in the experiential domain. Application of the cognitive domain involves participation.

Exposure was described by Steinaker and Bell (1975) as the consciousness of an experience and participation as the decision to become physically a part of an experience. They defined an experience as a hierarchy of stimuli, interaction, activity and response within a scope of sequentially related events. Each experience may be positive or negative.

The application category of Bloom's cognitive domain received the least attention of all of the categories. Bloom's original taxonomy was designed to facilitate communication about and evaluation or measurement of the learning outcomes of traditional learning. Bloom's taxonomy did not include the domain of experiential learning (Park, 1975).

Transfer of Learning

Transfer of learning means that experience or performance on one task influences performance on some subsequent task (Ellis, 1965, p. 3). Ellis stated that transfer of learning may take three different forms:

1. performance on one task may aid or facilitate performance on a second task, which represents <u>positive transfer</u>;

2. performance on one task may inhibit or disrupt performance on a second task, which represents negative transfer; or

3. there may be no effect of one task on another, in which case we have an instance of zero transfer.

Many educational programs have ignored or left the issue of transfer unanswered. Ellis (1965) stated that programmed instruction in particular has largely ignored the issue of transfer. He further stated that studies should be directed toward discovering features of programs that produce considerable transfer. Grose and Birney (1963) stated that transfer is clearly affected by the similarity in the tasks being performed.

Balson (1962) stated the only valid measure of the effectiveness of most programs is the performance of the student in an appropriate transfer situation. Though often it is impossible to secure this measure, it is clear that many inappropriate criteria are being used in evaluating programmed learning when more valid measures are available (Balson, 1962).

Learning Packages

Shear and Ray (1969) defined a learning package as a self-instructional unit developed for learning one basic concept or idea in which the idea to be learned is broken into its several components. This definition describes the learning package used for purposes of this study. This learning package was developed with line and design principles as the central idea of the unit. The learning package was broken into two components which were called modules.

According to Russell (1974) a module is an instructional package dealing with a single conceptual unit of subject matter. Modules have, in the past, been used in an attempt to individualize learning. When studying a module, the student controls the rate and intensity of study; therefore, modules place the responsibility for learning on the student rather than emphasize the instructor's teaching. Consequently, as Russell (1974) pointed out, a disadvantage of modules can be a lack of student interest. To overcome this disadvantage, Russell suggested that the module and teacher join forces to create a proper environment for student learning to take place.

Although many modules differ in their formats, all should include the following elements (Parsons, Treat, Burnette, Foster & Stockert, 1976): a title, a list of the major concepts to learn, a rationale for studying the module, a pre-assessment activity, behavioral objectives, guidelines for learner/teacher preparation, detailed learning sequence, suggested depth or quest activities, and a post-assessment activity. The module used for purposes of this study did include all elements listed by Parsons, although a different format and different names for these elements were used.

Readability

Klare (1963, p. 1) stated that the term readability has come to be used in three ways:

1. To indicate legibility of either handwriting or typography.
2. To indicate ease of reading due to either the interest value or the pleasantness of writing.

3. To indicate ease of understanding or comprehension due to the style of writing.

For purposes of this study, it is Klare's third definition that has meaning.

The Flesch (1951) reading ease score estimates this ease of understanding for a reader in regard to what has been written. The Flesch formula uses two scores, a reading ease score and a human interest score. The reading ease score results from calculations involving the number of words per sentence and the number of syllables per word. Flesch also has a chart that may be used to find the reading ease score. The reading ease score may involve systematically selected samples of 100 words or the entire material to be rated.

Flesch (1974) described a standard style of writing to be at the eighth-ninth grade level. The reading ease score for this level could range from 60-70. He suggested using short sentences and a simple vocabulary to achieve the desired reading ease score.

Many readability formulas are available today. Fry (1969) has a readability graph that determines grade level by plotting the number of sentences in 100 words against the number of syllables in 100 words. Fry suggested using the average of three 100 word samples in plotting the numbers.

The Dale-Chall formula is also calculated from 100 word samples. The average sentence length and the percent of words outside the Dale's List of 3,000 words are used in the formula to find the reading ease (Dale and Chall, 1948).

Dale (1967, p. 50) stated what readability formulas, wisely used, can do:

1. Give a rough indication of the difficulty which readers of varying abilities will have with the material.

2. Some formulas will tell you which words may be causing difficulty in the passage under study.

3. They call attention to the role of long, involved sentences in reading difficulty.

4. Formulas used in connection with lists of words known by students at varying levels will sensitize writers to vocabulary as a significant item in reading difficulty.

Readability formulas do have limitations. Klare (1963, pp. 24-25) listed four of these limitations:

1. Formulas measure only one aspect of writing--style.

2. Formulas measure only one aspect of style--difficulty.

3. Formulas do not even measure difficulty "perfectly."

4. Formulas are not measures of "good" style.

Thus, as Klare explained, style difficulty is shown to be only one characteristic of a piece of writing.

Klare (1963) evaluated many readability formulas for those trying to decide which formula to use. The most popular formula, he stated, is the Flesch Reading Ease Formula, which has the advantage of not only being used most frequently but also being the one on which the most research data are available (Klare, 1963). Studies show that there is high analyst reliability with the Flesch Reading Ease Formula.

It is recommended that the reading ease score be lower than the actual level of the intended students (Flesch, 1951). For example, a reader who has completed ninth grade might best be reached if the writing is on the seventh or eighth grade level.

Simulation

Beck and Monroe (1969) defined simulation as a procedure in which a model of a real situation or an analogy to it is created for the purpose of testing or teaching. Simulation may provide a learning experience in the classroom that represents a real life situation found outside of the classroom.

Jamieson (1973) stated that transfer of learning is an important concept for simulation exercises. He hypothesized that the greater the degree of similarity between a learning situation and a subsequent performance situation, the greater will be the amount of transfer of learning. This hypothesis supports simulation where the ability of the student to transfer the learning to a new situation may be increased. It also supports the use of visuals which may add more realism from an outside life situation to the simulation inside the classroom.

In some cases it is advisable to test both the acquisition of knowledge and its application in a realistic situation. Simulations are considered to be the most satisfactory way of doing this (Gibbs, 1974). Simulations impart insights into complex issues and behaviors and encourage the development of an understanding which is not easily acquired through factual knowledge (Mallen, 1973).

Often classes within the school system are theoretical. The student reads the text, the teacher explains certain points and the student is tested over the material presented. Transference of knowledge is only partially involved in this case. Motivation is

greater when the student actually gets involved, an area where simulation could play a part (McCormick, 1972).

Advantages of Simulation

Beck and Monroe (1969, p. 48) stated the following advantages of simulation over lecture-reading methods:

1. Simulation can provide experience in a wider range of educational objectives: affective as well as cognitive; process as well as content oriented; evaluation by self and system criteria as well as by the instructor; and elaborated concepts of cause and effect.

2. With simulation there may be greater transfer from the training situation to the life situation.

3. Simulation provides a responsive environment which may give learners a sense of immediacy and involvement.

Beck and Monroe continued with advantages of simulation over direct experience:

1. Cost: Simulation can provide experience in a low cost model of a high cost environment. Practice in business management is possible without the risk of bankruptcy; a pilot trainee can make a "fatal" mistake without loss of life or aircraft. This is a comparative statement. Simulation can be expensive.

2. Time Control: Simulation can provide short time experience and feedback in long time processes. Results of farm management decisions can be evaluated without waiting for harvest time; a flight around the moon can be achieved in minutes instead of days. Elaborate technology is required to support this time manipulation. Simulation allows practice in decision making in a timeless environment. Traffic patterns requiring rapid decisions can be slowed down for beginners in driver training; instruments which signal emergency conditions can be studied for a longer time than a real situation would allow.

3. Experimentation: Simulation can provide a field for practice in hypothesis formulation, testing and modification. Successive strategies in problem solving can be tried on an "unchanging" base situation.

Cruickshank (1972, p. 18) listed other advantages to simulation:

1. Can be used to collect data about how people behave under certain life-like circumstances.

2. Can be used to determine whether or not participants are able to apply principles, laws and facts they have learned to life-like situations.

3. Can be used to condition participants to behave in a certain way.

4. Can be used to provide experiences not normally available in training.

5. Permits participants to look at only selected, simplified, controlled elements of reality rather than trying to look at and understand all of it.

6. Permits participants to engage in potentially dangerous, threatening situations without danger and threat.

7. Found to be more involving intellectually and emotionally than most forms of instruction.

Koeninger (1974, p. 5) stated, if properly used, simulation can:

1. Encourage a high degree of individual involvement and motivation toward the simulated activities.

2. Facilitate greater transfer of learning from the classroom to an on-the-job experience.

3. Provide a relatively safe learning environment in which decisions can be made without threat of censure.

4. Present critical incidents that may not always occur while training in a real situation.

5. Bridge the gap between theory and practice.

6. Provide an effective learning environment as an alternative instructional method when on-the-job training is not feasible or possible.

7. Allow evaluation by observers in which assessment of performance in a real situation would be difficult or impossible.

8. Allow improvement in decision-making skills.

9. Be a forecaster of future performance of those participating in the learning experience.

Disadvantages of Simulation

Beck and Monroe (1969, p. 49) stated the following disadvantages in regard to simulation:

1. Design problems which center on two themes:

   a. achieving fidelity to the real situation in the variables relevant for transfer to life situations as they are met;

   b. validation of the simulation program as an effective medium for learning.

2. Cost in relation to:

   a. development of the program, including field testing and revisions;

   b. the environmental requirements for installation and use of the simulation program after it is developed; and

   c. training personnel for effective supervision of simulation training programs.

Koeninger (1974, p. 7) stated the overriding disadvantage is that simulations are only "realistic," not "reality." The simulated environment presents only central features of the real world, not the total environment. Koeninger also pointed out that simulations are not appropriate for teaching all topics and, as with any method, if it is used too much, the student will become bored with the approach.

Simulation and Career Education

It is generally agreed that the student benefits from early exposure to the realities of the position for which he is training. To delay this exposure until the student has committed a great deal of time, effort, and money to a curriculum is an unjust practice (Smith, 1975). Simulation may expose a student to the realities of a specific career.

Many basic problems face the postsecondary distributive education programs. Some of these problems are overlooked or ignored in the process of establishing a curriculum commensurate with current practices in educational procedures. Ogg (1975, p. 20) listed the following areas among those often neglected or unresolved:

1. Student career decisions. A majority of the students entering the postsecondary level of education have not had the opportunity to adequately explore and determine the various career opportunities in the area of marketing. Many have a nebulous idea of some career field, but they have not experienced or been oriented and informed of the requirements, the advantages, restrictions, and the activities involved in their "dream" goals. Actual study and work experience in the career field, or a closely related area, will many times introduce obstacles or work situations that completely disillusion them, and they must then search for other areas of interest.

2. Inadequate incentives and motivation. Many students have not developed a personal incentive or the necessary motivation to actively pursue any particular course of instruction. They are attending college just to have something to do, their parents want them to go, it's easier than working, their friends are going, or they are looking for a mate.

Simulation can help in career decisions and in motivation of students. Simulation can be a serious approximation to reality which may determine acceptance for, or rejection from, a specific

career (Jamieson, 1973). Simulation involves those who participate and makes them enthusiastic and motivated (Bloomer, 1973).

Visual Evaluation

Lamb (1971) observed that the versatility of slides as learning resources and as aids to teaching is great. His research in this area concerned the use of slides with individual learning packages at the Thomas Bennett School. In Planning and Producing Slide Programs (1975) it is stated that slides are an excellent medium for improving communication. Also, properly designed slide presentations have the added advantage of holding students' attention and of creating and building interest.

As a matter of fact, slides have many advantages as a teaching aid. One of the major advantages is flexibility. A slide series may be easily updated by replacing outdated slides with newer ones. Also, a slide series may be reorganized to meet the current needs of the classroom. The slides themselves may be used to add realism to simulated experiences, for they visually illustrate situations found in the real world. Slides are versatile, as they may serve as a learning experience or as an evaluative device.

Ellison (1973) in his report on the use of visual tests, stated that often evaluation instruments cannot uncover significant information. Visual media may run the risk of being penalized by an evaluation using only paper-pencil tests. A visual test (a test which includes visuals as slides) could evaluate nonverbal material. It would measure the extent to which facts are assembled into patterns of understanding.

Some advantages of visual testing that Ellison (1973, pp. 51-52) listed are:

1. A visual test appeals to the learner.

2. A visual test frankly reveals if the learner does not know something.

3. A visual test provides a more objective method of scoring.

4. A visual test helps reduce dependence upon reading as a sole means of producing test stimuli.

5. Various parts of questions on visual tests can be presented almost simultaneously, without necessity for step-by-step, piece-by-piece verbal buildups or descriptions on which strictly paper-pencil test questions are based.

6. A visual test shows observable relationships among various parts of data in question.

7. Pictorial or graphic representations of things, events or situations can be relatively lifelike, thus making it easier for learners to see relationships in testing situations.

8. A visual test may provide stimulating variety, thus improving the learner's attitudes toward test taking.

9. Some learners believe that they are better able to demonstrate their ability on a visual test.

10. In some instances, tests employing means other than written materials can measure aspects of objectives which cannot be measured at all by strictly paper-pencil tests.

11. Emphasis on behavioral objectives suggests that tests of learner performance based upon the use of real materials requiring learner identification, manipulation or analysis are often superior to paper-pencil tests for measuring true achievement. The same logic holds true with material presented visually.

12. A visual test requires only one copy of the test.

13. A visual test on slides is more economical to prepare than paper-pencil tests.

14. Storage of a visual test is minimal compared to facilities needed to store paper-pencil tests.

15. A visual test, if properly made and stored, will remain in its original state almost indefinitely. A paper-pencil test that is used repeatedly becomes marked and frayed, and after awhile, unusable.

16. Possibly the most practical aspect of a visual test is the rapidity with which tests can be constructed. With a file of slides available, the time required to construct a test is minimal. This allows an instructor to select specific items related to current course content.

Lamb (1971, p. 84) concluded that the visual aid not only acts as a stimulus promoting the perceptions from which learning occurs, but it also helps develop the learning processes themselves. Eighty-three percent of what people learn is learned from sight (Lamb, 1971). Thus, it appears that slide projectors, as other visual aids, have a great role to play in education.

Review of Related Research

Several studies have been completed which were related to application of principles or generalizations. Boone (1968) developed an instrument to measure the ability of students to apply generalizations in the area of housing. In order to devise an objective instrument, Boone first selected the facts, principles and generalizations to be tested. Then twelve problems were set up in which the facts, principles and generalizations applied. Each problem provided two or more plausible alternative answers. Students selected the best answer to the problem and selected one of the four possible reasons supporting their answer.

Boone used a six week unit on housing and a test. The same test was used before and after the unit was taught. Two experimental groups were involved, fifteen students in one and twelve in the other. Three control groups were used, consisting of eleven, eight and fourteen students. The control group received a conventional method of teaching the unit, where the experimental group was exposed to the generalization method of teaching. Results indicated a high degree of success in using the generalization method of teaching the six week unit on housing.

Boone concluded that an instrument can be developed to test the ability of students at the secondary level to apply generalizations in the area of housing. Boone did suggest also that the items be more discriminating and that the test be lengthened. Another recommendation was that each of the seven major generalizations be used more than once in the instrument.

Stoflet (1948) tested for application of principles of line in elementary costume design. The study incorporated a paper-and-pencil test to determine college students' ability to apply principles of line to new situations. The test consisted of thirteen items and illustrations of six figure types. The students selected the best costume detail for each figure and supported their choices by selecting from given reasons.

Stoflet's test was administered to forty-seven college students. Stoflet found that many items in both the choices and the reasons showed little or no discriminating value. The reliability of the test was obtained by computing the coefficient of correlation

between the odd-numbered and even-numbered items. The correlation was too low for group or individual prediction.

Application of textile knowledge was measured in an instrument developed by Lott (1973). A major concern of the study was the relationship of knowledge gained to actual application. One of Lott's hypotheses was that a relationship would exist between knowledge and application scores for the experimental group.

The sample in Lott's study consisted of four classes of students enrolled in high school home economics. The experimental group of thirty students was taught by Lott, while the control group of thirty students was taught by another teacher. The evaluation device was in two parts and was used as a pretest, posttest and retest. The knowledge segment included objective questions to measure factual knowledge. The application segment consisted of eighteen displays of garments with problems, garments to compare, fabric swatches to compare, and catalog pages and labels to read. This segment was designed to evaluate application of knowledge to these problem situations. The pretest was given before and the posttest was given after the five-day textile unit which was presented to the experimental group. Six weeks after the posttest, a a retest was given to the experimental group to measure the retention of the textile information by the students.

The Pearson product moment correlation coefficients were calculated for the knowledge and application sections of the posttest and of the retest of the experimental group to determine if a relationship existed between knowledge and application. Significance was determined by the .05 level of probability. The correlation

was significant; thus, the hypothesis that a relationship would exist between knowledge and application scores for the experimental group was supported.

McKeever (1968) also developed an application instrument related to textile knowledge. The objectives of this study included: (1) the development of textile concepts and generalizations for senior high school students related to textiles; (2) the development of behavioral objectives related to textile generalizations; (3) the development of test items to evaluate application of textile knowledge; (4) the validation of the test items; and (5) the checking of the test for reliability and discrimination.

Johnson (1952) studied the application of the thinking processes in the teaching of home economics. She found that teachers need both of the following in order to help students develop the ability to think:

1. To know how to apply facts and principles to the solving of problems.
2. To be able to develop and apply generalizations in similar situations (Johnson, 1952, p. 38).

Summary

There is general agreement that students should be able to apply what they learn in school to problems faced in real life. Educators question the effectiveness of evaluating students only at the knowledge level. Research continues to investigate the relationship between knowledge of facts and the application of those facts.

Simulation has been identified as an important tool in presenting real life problems to students in the classroom. In fact, it has been found effective in helping students to further understand the relationship between factual knowledge and its application. Furthermore, simulation can be part of the answer to student career indecision and lack of motivation.

In the review of literature, many advantages of visual tests have been noted. The research supports the fact that visual tests in combination with simulated experiences may have great potential in dealing with the application problem. Such support of this idea justifies further study.

CHAPTER III

PROCEDURES AND METHODS

The objectives of this study were: (1) to develop a simulated activity which measures students' application levels pertaining to the use of line and design principles in the selection of women's clothing, (2) to measure the knowledge levels and the application levels of students pertaining to women's wear line and design principles, (3) to study the relationship between students' knowledge levels and their application levels pertaining to women's wear line and design principles and to consider selected factors in the students' backgrounds, and (4) to make recommendations for revision of the simulated activity.

The following discussion presents the procedures for this study. The procedures were organized into four phases, each phase relating to one objective.

Phase I - Development of the Simulated Activity

The procedures for Phase I were designed to accomplish the following objective: to develop a simulated activity which measures students' application levels pertaining to the use of line and design principles in the selection of women's clothing. In order to achieve this objective, it was necessary to formulate

statements of basic principles pertaining to the two women's wear line and design modules used in this study, to prepare a series of 35 mm slides of current merchandise representative of the selected basic principles and to prepare the simulated activity which would evaluate the students' ability to use the basic principles of line and design in the selection of women's clothing.

Formulation of Statements of Basic Principles

The two modules used for purposes of this study were sequential in order. Module I introduced basic principles related to line, color and texture. The tests for this module included recall of those principles. Module II related the basic principles presented in Module I to four figure types and six figure problems which were used in designing the simulated activity. The list of the figure types and figure problems appears in Appendix A.

A list of the basic design principles presented in the two modules was formulated as the basis of information used to design the simulated activity. The following procedures were used to develop this list of design principles: the pretests, posttests and information sheets for each of the two modules selected for this study were reviewed; the basic design principles were selected from the content of the modules, with the criterion that each principle could be represented visually in current merchandise; and a list of basic design principles pertaining to the two modules was compiled. These principles are listed in Appendix B.

Preparation of Slide Series

A series of 35 mm slides was made of appropriate current merchandise which visually illustrated the selected line and design principles. The slides were used to design the simulated activity. The following procedures were used to develop the slide series: a thorough search was made of the merchandise in local stores selling women's dresses, coats and/or sportswear in order to find current merchandise representative of each of the basic design principles; 35 mm slides were taken of individual garments which represented one or more of the basic design principles; and the slides were developed and organized by merchandise classifications (i.e., dresses together, coats together, etc.), similar to the merchandise groupings in women's retail clothing stores.

The writer viewed the slides and eliminated the duplicates, those which were blurred, and those which failed to clearly illustrate a basic design principle. Those slides still in question, along with the better slides, were then viewed by a panel of three judges. The panel included one faculty member of the Clothing, Textiles and Merchandising department of Oklahoma State University, one graduate student of the Home Economics Education department at Oklahoma State University and one women's apparel manufacturing design consultant of Dallas, Texas. The panel considered which slides seemed to be the best representation of each design principle and made suggestions as to which slides to eliminate from the group.

The 53 slides the panel selected were paired with the principles they represented, and an evaluation chart was prepared. This evaluation chart for the slides is presented in Appendix C. A panel of judges composed of four graduate students in the Clothing, Textiles and Merchandising Department of Oklahoma State University viewed the slides and rated whether or not each slide visually illustrated the specified design principle. Based on suggestions received from this panel of judges, 15 slides were eliminated from the series.

Each of the 41 slides in the final series was numbered. Three of these slides were labeled to indicate the type of merchandise to be shown in the slide series. One slide had the title of dresses, one slide had the title of coats and the other was entitled sportswear. The titles were similar to signs found in specific departments of retail clothing stores. A written description of each slide that appeared in the final slide series is included in Appendix D.

Preparation of Simulated Activity

The simulated activity was developed to measure the students' ability to apply the design principles presented in the two modules. The activity included 20 simulated selling situations. Each selling situation consisted of a description of a customer figure type or problem, a list of principles which might apply to the figure type or problem and a group of slides illustrating merchandise which might be appropriate for the customer. The instructions for the simulated activity are in Appendix E.

Each simulated selling situation was called a customer mini-case. Two customer mini-cases were prepared for each figure type and figure problem. Examples of these appear in Appendix F.

The set of twenty customer mini-cases and 41 slides was identified as a visual activity. The mini-cases were arranged by merchandise departments, and the customer figure types and problems appeared randomly in each department.

The simulated activity was tested with three girls of high school age who had studied the two modules. Each girl completed an evaluation form following the simulated activity. Based on the results of the testing and the reactions to the evaluation forms, revisions were made. Although no changes in the principles or slides were necessary, the separate answer sheet was eliminated and the time requirements for completing each simulated selling situation were established. The revised copy was tested by a distributive education student from C. E. Donart High School in Stillwater, Oklahoma. The evaluation form developed to accompany the simulated activity was completed by the student also. No further revisions were necessary.

The final copy of the simulated activity was tested with three distributive education and three home economics students from the Greenwood and Pestle (1977) research project. Based on the results of this pilot test, scoring methods were determined. Each student also completed an evaluation form which was used in making the final revision of the simulated activity. The results of the student evaluation are in Appendix G.

The scoring method devised was similar to that used with the pretests and posttests of the two modules. From the twenty customer mini-cases, there were sixty-two possible correct choices of principles and slides. The number wrong was subtracted from sixty-two, and then a percentage score was calculated based on 62 = 100%. For example, if a student missed 8, then the number correct was 54, which was equal to 87%. Students were not penalized for incorrect responses.

Phase II - Measurement of Students' Knowledge Levels and Application Levels

The procedures for Phase II were designed to accomplish the following objective: to measure the knowledge levels and the application levels of students pertaining to women's wear line and design principles. In order to achieve this objective, it was necessary to select a sample, administer the pretests and posttests which accompany the two modules and administer the simulated activity.

Selection of Sample

The sample in this study was drawn from distributive education classes at C. E. Donart High School in Stillwater, Oklahoma. Twenty-three girls were given an opportunity to participate in the study. Each participant also completed a background questionnaire developed by the writer. The questionnaire related to each student's previous work experience, course work and knowledge of line and design

principles which might affect the simulated activity score. A copy of the background questionnaire appears in Appendix H.

Seventeen girls completed the simulated activity after studying the two modules related to the line and design principles. Those completing the simulated activity were first year distributive education students, including both juniors and seniors.

Administration of Pretests and Posttests

The pretests and posttests for Module I and Module II were used to measure the students' knowledge levels. The project was presented to the 23 students, each of whom was given the two modules pertaining to line and design principles. A pretest was given before the students studied each module to determine the extent of knowledge the students possessed prior to completing the modules. The majority of the students completed their pretests on February 14, 1977. Following each pretest, the students studied the information in each module and completed the related activities. A posttest was given after the students completed their study of each module. Students were allowed approximately 2½ weeks to complete the two modules. The pretest and posttest for each module were identical.

The pretests and posttests were scored by the writer. The total score for each test was calculated on the basis of 100% being a perfect score. The gain score was determined by subtracting the posttest score from the pretest score. The pretest, posttest and gain scores were then recorded for each student. The composite score sheet appears in Appendix I.

The posttest scores were used to evaluate the students' knowledge levels in relation to the basic design principles presented in the two modules. The mean score was calculated for each set of scores and distributions were noted for the pretest, posttest and gain scores. Only the scores for the 17 students who completed the simulated activity were included in the calculations.

Administration of Simulated Activity

The simulated activity was used to evaluate the students' application levels in relation to the line and design principles presented in Module I and Module II. On March 3, 1977, the simulated activity was presented to 17 of the 23 students. Six students were not in attendance the day scheduled for the simulated activity or had dropped out of the project for various reasons. Approximately 50 minutes of class time was used to complete the simulated activity.

The scores from the simulated activity were used to evaluate the students' application levels. In order to obtain these scores, the following procedures were used. First, the students were instructed to read the directions for the simulated activity. Second, an example of a customer mini-case was used to demonstrate how to complete each case. Students were then instructed to read the first mini-case. Next, the students were asked to complete the case study and select the principles that applied to the simulated selling situation. Then the slides were shown to the group and students were asked to select the slides that visually illustrated the most flattering merchandise for the customer, based upon the principles

involved. Students were allowed about four seconds to view each slide and were instructed to raise their hands if they desired to see the slides more than once. This procedure was followed for each of the remaining customer mini-cases.

The mean score was calculated from the group of simulated activity scores. The distribution of the scores was also noted.

Phase III - Comparison of Students' Knowledge Levels and Application Levels

The procedures for Phase III were designed to accomplish the following objective: to study the relationship between students' knowledge levels and their application levels pertaining to women's wear line and design principles and to consider selected factors in the students' backgrounds. In order to achieve this objective, it was necessary to analyze the students' posttest, gain and simulated activity scores and to give consideration to selected factors in the students' backgrounds.

Analysis of Posttest, Gain and Simulated Activity Scores

Statistical methods were used to test the following null hypotheses: there will be no significant correlation between the Module I posttest scores and the simulated activity scores; there will be no significant correlation between the Module II posttest scores and the simulated activity scores; there will be no significant correlation between the Module I gain scores and the simulated activity scores; and there will be no significant correlation between the Module II gain scores and the simulated activity scores.

Each hypothesis was tested by the following methods. A regression analysis was completed for each group of scores. Regression analysis is a means of studying the variation of one quantity (dependent variable) at selected levels of another quantity (independent variable). The purpose of a regression analysis is to predict or forecast and to explain the current structure or functional relationships between the dependent and independent variables. The following formulas were used in the regression analysis (Blalock, 1972, p. 374):

$$b = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{N\Sigma X^2 - (\Sigma X)^2} \qquad a = \frac{\Sigma Y - b\Sigma X}{N}$$

The "b" represents the slope, and the "a" represents the intercept of the "y" axis. The independent variable is represented by the "X" and the dependent variable by the "Y." The symbol "Σ" indicates the summation of the variable it precedes. The "N" represents the number in the sample. The following formula was used to fit the data with a best-fitting straight line according to the least-squares criterion (Blalock, 1972, p. 370):

$$Y = a + bX$$

Standard error was calculated for each least-squares line. Standard error is the average distance one misses the points predicted. The following formula was used to calculate the standard error or sample variance about the least-squares line (Blalock, 1972, p. 391):

$$S^2_{y/x} = \frac{\Sigma(Y - Y_p)^2}{N}$$

The "Y_p" is equal to "a + bX."

A correlation was also completed for each group of scores. Correlation is a measure of the extent to which data fall on a straight line. Pearson is a measure of correlation which assumes interval data. The closer the Pearson correlation coefficient comes to a plus or minus one, the stronger the relationship. The following formula was used to calculate the Pearson correlation coefficient (Blalock, 1972, p. 380):

$$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

To find the significance for each correlation coefficient, a table of 5% and 1% points for "r" was used (Snedecor, 1946, p. 351).

Consideration of Students' Backgrounds

A questionnaire was developed by the writer to be completed by each student participating in the study. The questionnaire was used to collect the following kinds of data: previous work experience in a women's clothing store, previous course work related to line and design, and personal knowledge of figure types and problems. This information was studied in relation to the students' scores on the simulated activity.

Phase IV - Recommendations for Revision of the Simulated Activity

The procedures for Phase IV were designed to accomplish the following objective: to make recommendations for revision of the simulated activity. In order to achieve this objective, it was necessary to complete an item analysis of the simulated activity and to give consideration to the results of the students' evaluations and to the writer's observations.

Completion of Item Analysis

An item analysis may reveal the difficulty of each item and the extent to which each item discriminates between the low scoring and high scoring students. The purpose of the item analysis in this study was to improve the simulated activity by eliminating weak items, whether visual or written.

The following formula was used to calculate the item difficulty (Marshall and Hales, 1972, p. 79).

$$D = \frac{R_U + R_L}{N_U + N_L}$$

The subscript "U" represents those scoring in the upper 29% of the scores, and the subscript "L" represents those in the lower 29% group of scores. The "R" represents the number of students that answered the item correctly, and the "N" represents the number of students in each group. As Marshall and Hale stated (1972, p. 79), a test

designed to obtain maximum differentiation among the examinees theoretically should be of 50% difficulty.

Discriminating value may be calculated by using the following formula (Marshall and Hale, 1972, p. 82):

$$V = \frac{R_U}{N_U} - \frac{R_L}{N_L}$$

The "V" represents the item validity. Marshall and Hale (1972, p. 79) stated that items that have a value which is negative or below .20 exhibit negative discrimination. Items between .20 and .40 are of some value in discrimination, while those above .60 are unusually good (Marshall and Hale, 1972, p. 79).

Consideration of Students' Evaluations

A one page evaluation form was developed by the writer for students to judge the simulated activity and give suggestions or comments. After completing the simulated activity, each student was asked to complete the evaluation form. The students were asked not to sign their names on the evaluations. An example of this evaluation form appears in Appendix J.

The students' evaluations and comments were considered in making suggestions for revision of the simulated activity, both in the visual and written materials. Other questions considered on the evaluation related to the students' backgrounds and how they may or may not have affected the students' results on the simulated activity.

Consideration of Writer's Observations

The writer observed the students' reactions during the administration of the simulated activity. These observations were considered in suggesting revisions for the simulated activity.

CHAPTER IV

RESULTS AND ANALYSIS OF DATA

The purposes of this study were to develop an instrument which would measure the ability of students to apply basic line and design principles in the selection of women's clothing and to study the relationships among the students' knowledge of the design principles, their ability to apply the design principles and their previous background experiences which may have affected their application ability. The findings of the study will be discussed in the following order: (1) the simulated activity, (2) description of sample, (3) students' knowledge levels, (4) students' application levels, (5) relationship between students' knowledge levels and application levels, (6) relationship between students' backgrounds and application levels, and (7) recommendations for revision of the simulated activity.

The Simulated Activity

The simulated activity developed from the 21 basic line and design principles consisted of 20 customer mini-cases and a set of 41 slides. Each mini-case included a selling situation involving a customer figure type or figure problem. The figure types and problems appear in Appendix A. Each customer mini-case provided an opportunity for students to select one or two principles that would

apply to the figure type or problem and to select one or two slides that visually illustrated the most appropriate merchandise for the customer based upon the principles involved. The basic principles are listed in Appendix B. The written descriptions of the slides are in Appendix D.

The simulated activity included instructions and an example of how to complete the customer mini-cases. Each mini-case served to measure the ability of students to select the most appropriate merchandise in a simulated selling situation. Examples of the simulated activity instructions and customer mini-cases are in Appendixes E and F. The type of merchandise and the customer's figure type or problem used in each mini-case are listed in Table I.

Each figure type and figure problem was represented in two customer mini-cases. The figures appeared in a random order; however, the slides appeared according to merchandise groupings.

Description of Sample

The sample included 23 distributive education students from C. E. Donart High School in Stillwater, Oklahoma, 6 of whom did not complete the simulated activity. The 17 students who completed the simulated activity were enrolled in two classes of distributive education. Of these 17 students, 6 were seniors and 11 juniors. The students' background experiences are reported in Table II.

At the time of the study, 9 (53%) of the 17 students completing the simulated activity were employed in a retail clothing store. Ten (59%) of the 17 students had previously had courses presenting information about the use of design principles related to line, color

TABLE I

MERCHANDISE AND CUSTOMER'S FIGURE TYPE OR PROBLEM PRESENTED IN EACH MINI-CASE

Customer Mini-Case Number	Type of Merchandise	Customer's Figure Type or Problem
1	Dress (short)	Full Bust
2	Dress (short)	Small Hip
3	Dress (short)	Narrow Shoulder
4	Dress (short)	Tall, Full
5	Dress (short)	Short, Slim
6	Dress (short)	Short, Full
7	Dress (long)	Tall, Full
8	Dress (long)	Tall, Slim
9	Dress (long)	Full Hip
10	Dress (long)	Small Bust
11	Dress (long)	Short, Slim
12	Coat	Wide Shoulder
13	Coat	Short, Full
14	Coat	Tall, Slim
15	Sportswear (slacks)	Small Hip
16	Sportswear (slacks)	Full Hip
17	Sportswear (sweater)	Small Bust
18	Sportswear (blouse)	Wide Shoulder
19	Sportswear (blouse)	Full Bust
20	Sportswear (blouse)	Narrow Shoulder

TABLE II

STUDENTS' BACKGROUND EXPERIENCES

Background Experiences	N = 17 Students Number	%
Employed in a Retail Clothing Store	9	53
Previously Sold Women's Dresses	3	18
Previously Sold Women's Coats	4	24
Previously Sold Women's Sportswear	6	35
Previously Studied Line & Design	10	59
Previously Aware of Figure Types & Problems	16	94

and texture. Sixteen (94%) of the 17 students had previously been aware of figure types and figure problems in relation to their own or another's figure.

Students' Knowledge Levels

Pretest, posttest and gain scores were obtained for Module I and Module II in order to measure the students' knowledge levels. An analysis of the scores was made for the 17 students who completed the simulated activity. A comparison of the pretest, posttest and gain scores for Module I and Module II is in Table III.

The mean of the pretest scores for Module I was 57, while the mean of the posttest scores was 77. The mean of the pretest scores for Module II was 58, while the mean of the posttest scores was 76.

TABLE III

COMPARISON OF PRETEST, POSTTEST AND GAIN SCORES FOR MODULE I AND MODULE II

	Pretest			Posttest			Gain		
Module	Low	High	Mean	Low	High	Mean	Low	High	Mean
I	29	73	57	42	98	77	0	42	20
II	42	75	58	42	94	76	-6	41	19

The mean of the gain scores for Module I was 20, while the mean of the gain scores for Module II was 19. There was only one point variation between the means of the pretest, posttest and gain scores for the two modules. The scores of individual students are presented in Appendix I.

A comparison of the pretest and posttest scores for Module I and Module II indicated that very few students scored above 70 on either pretest. The majority of the students scored above 70 on the posttests of both modules. Posttest scores tended to be higher on Module I than on Module II. The comparison of pretest and posttest scores for the two modules is shown in Figures 1 and 2.

Students' Application Levels

The scores for the simulated activity were used to measure the students' application levels. Seventeen students completed the simulated activity. The mean score for the simulated activity was 79.

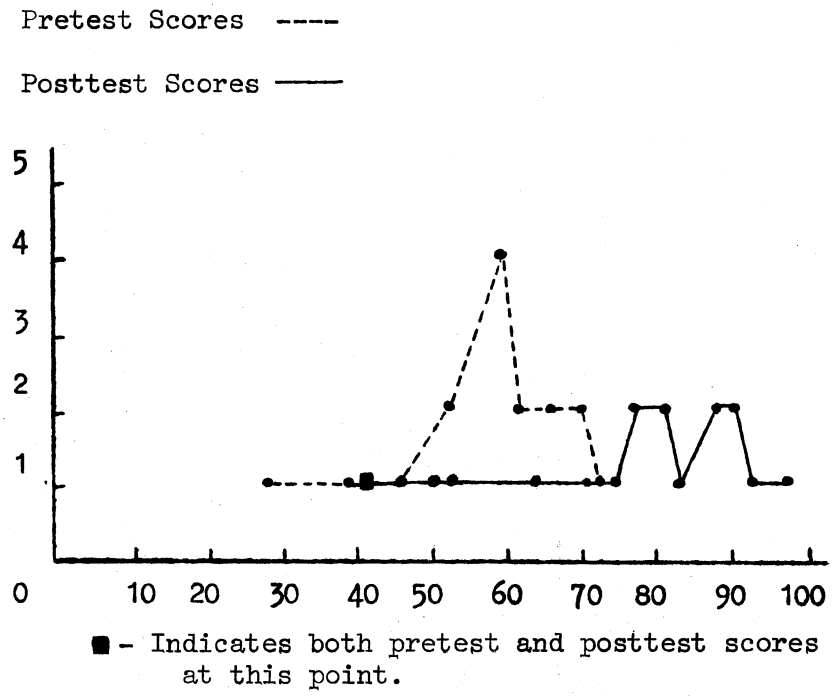

Figure 1. Comparison of Distribution of Module I Pretest and Posttest Scores

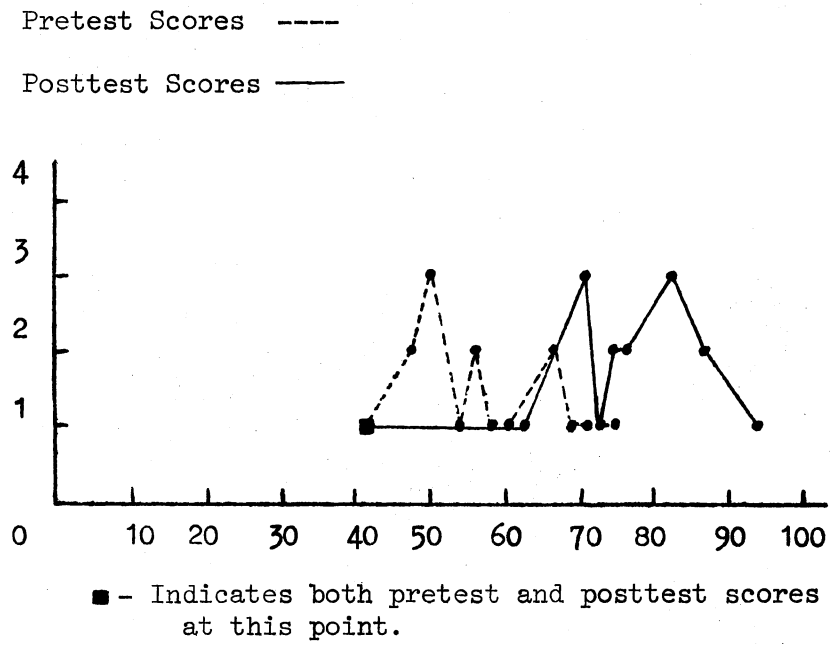

Figure 2. Comparison of Distribution of Module II Pretest and Posttest Scores

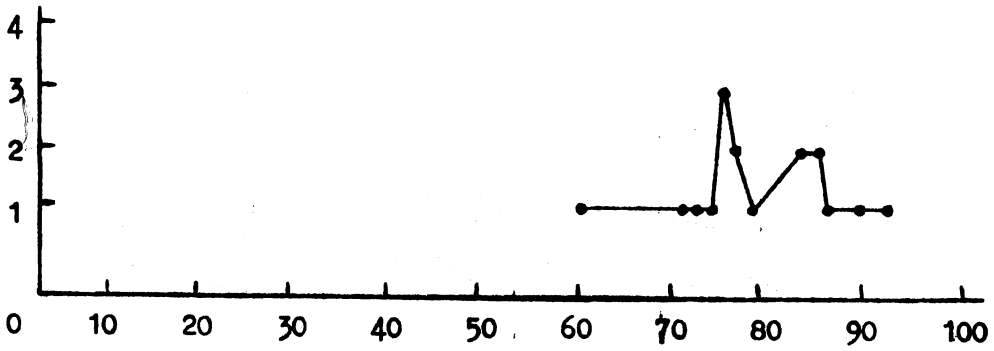

Figure 3. Distribution of Simulated Activity Scores

Seven of the 17 students scored above the mean on the simulated activity. The distribution of simulated activity scores is presented in Figure 3 above.

The highest score was 92, while the lowest score was 60. The majority of students scored between 70 and 80, the most frequent score being 76. The scores of individual students appear in Appendix I.

Relationship Between Students' Knowledge Levels and Application Levels

The students' knowledge levels in regard to the line and design principles was measured by the posttest scores on the two modules before the simulated activity was completed. The simulated activity was developed from the same information presented in the two modules. The students' application levels in regard to the line and design principles was measured by the simulated activity scores. The relationship

between students' knowledge and application levels was analyzed in terms of the four hypotheses.

Hypothesis One

In the first hypothesis it was stated that there would be no significant correlation between the Module I posttest scores and the simulated activity scores. A scattergram and least-squares line for the Module I posttest scores and the simulated activity scores are presented in Figure 4.

The standard error for these scores was 7.0576. This meant that on the average there was an error of 7.0576 units in the predicted Module I posttest and simulated activity scores from the observed Module I posttest and simulated activity scores.

The Pearson correlation coefficient was .3637 for Module I posttest scores and the simulated activity scores. This coefficient does not indicate a very strong relationship between the two groups of scores. The relationship is positive, indicating that as the simulated activity scores increase, the Module I posttest scores tend to increase; or as one decreases the other tends to decrease. The coefficient does not appear to be statistically significant at the .05 level, according to the table of 5% points for "r" (Snedecor, 1946, p. 351). The null hypothesis was not rejected.

It is noted that basic line and design principles were presented in Module I, and students were tested for the recall of those principles. The objectives from Module I would be classified under the knowledge level of the cognitive domain. It would tend to appear

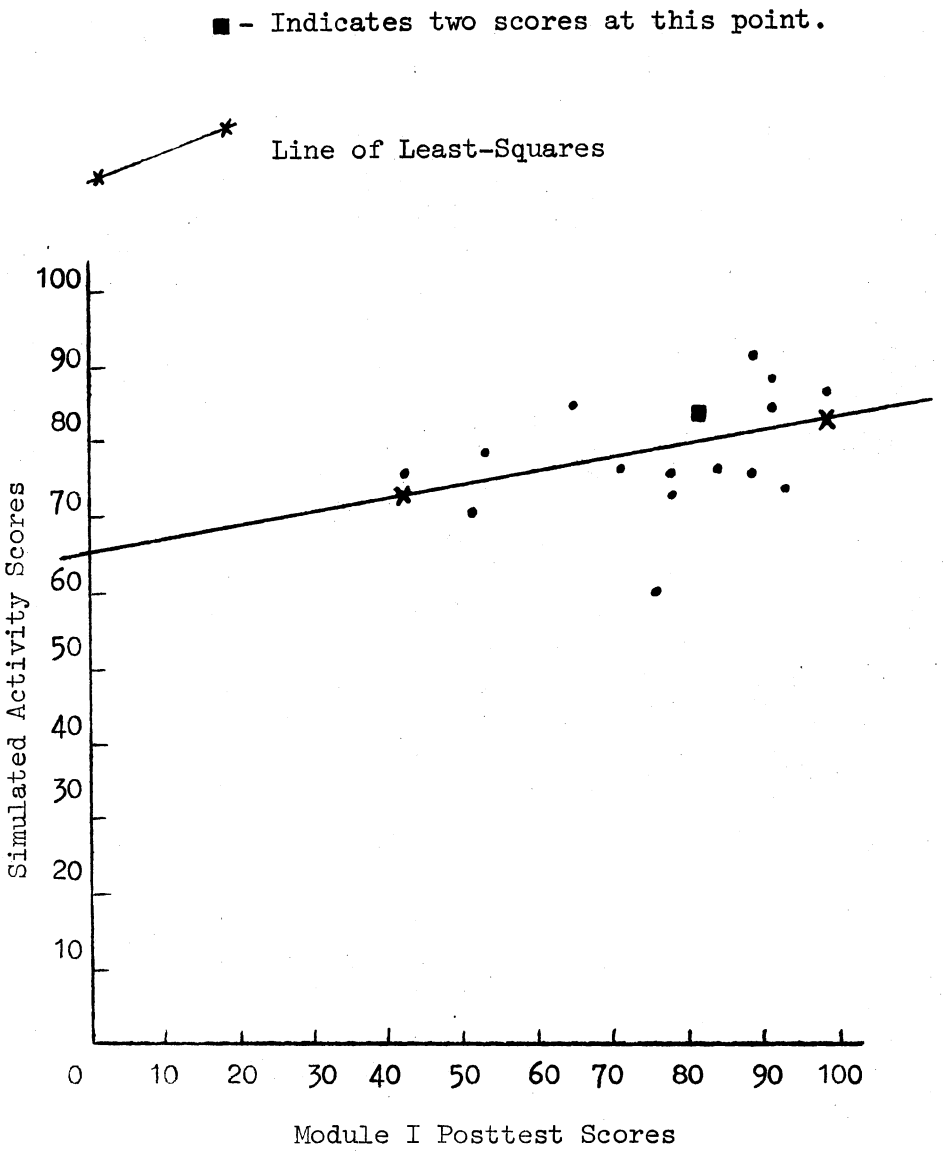

Figure 4. Scattergram and Least-Squares Line for the Module I Posttest Scores and the Simulated Activity Scores

in this study that students' ability to recall the principles did not relate significantly to the students' ability to apply the principles.

Hypothesis Two

In the second hypothesis it was stated that there would be no significant correlation between the Module II posttest scores and the simulated activity scores. A scattergram and least-squares line for the Module II posttest scores and the simulated activity scores are presented in Figure 5.

The standard error for these scores was 6.4329. This meant that on the average there was an error of 6.4329 units in the predicted Module II posttest and simulated activity scores from the observed Module II posttest and simulated activity scores.

The Pearson correlation coefficient was .5670 for the Module II posttest scores and the simulated activity scores. The relationship is positive, indicating that as the simulated activity score increases, the Module II posttest score tends to increase; or as one decreases the other tends to decrease. The coefficient does appear to be statistically significant at the .05 level; thus, the null hypothesis was rejected.

It is noted that in Module II, the principles from Module I were discussed in relation to different figure types and problems. The Module II posttest measured the students' comprehension of the principles as they were presented in the module. According to Bloom (1956), the first three classes of the cognitive domain, knowledge,

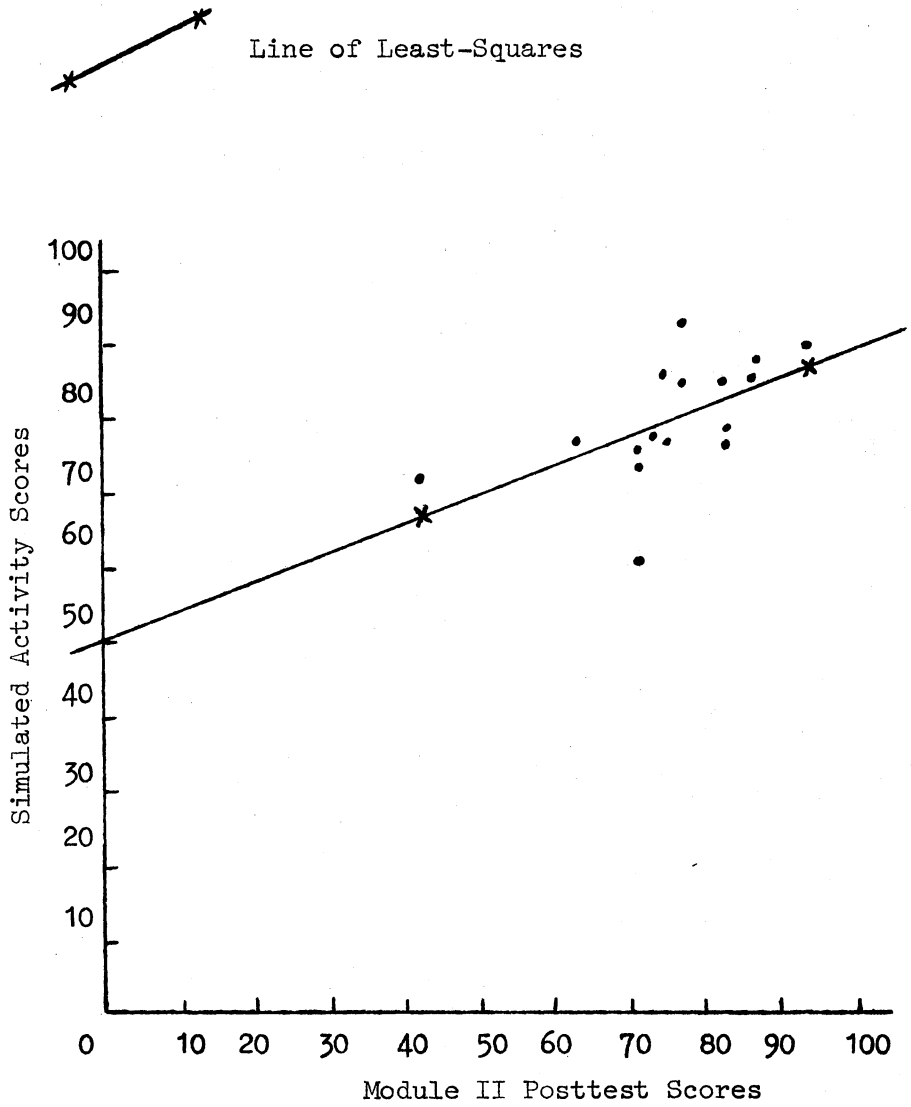

Figure 5. Scattergram and Least-Squares Line for the Module II Posttest Scores and the Simulated Activity Scores

comprehension and application, are in a hierarchy. Objectives from the application class tend to make use of those in the preceding classes (Bloom, 1956). Thus, it would be expected that a stronger relationship would exist between the Module II posttest scores and the simulated activity scores.

Hypothesis Three

In the third hypothesis it was stated that there would be no significant correlation between the Module I gain scores and the simulated activity scores. A scattergram and least-squares line for the Module I gain scores and the simulated activity scores are located in Figure 6.

The standard error for these scores was 7.3939. This meant that on the average there was an error of 7.3939 units in the predicted Module I gain and simulated activity scores from the observed Module I gain and simulated activity scores.

The Pearson correlation coefficient for the Module I gain scores and the simulated activity scores was .2184. This coefficient does not indicate a very strong relationship. The relationship is positive, indicating that as the simulated activity score increases, the Module I gain score tends to increase; or as one decreases, the other tends to decrease. The coefficient does not appear to be statistically significant at the .05 level; thus, the null hypothesis was not rejected.

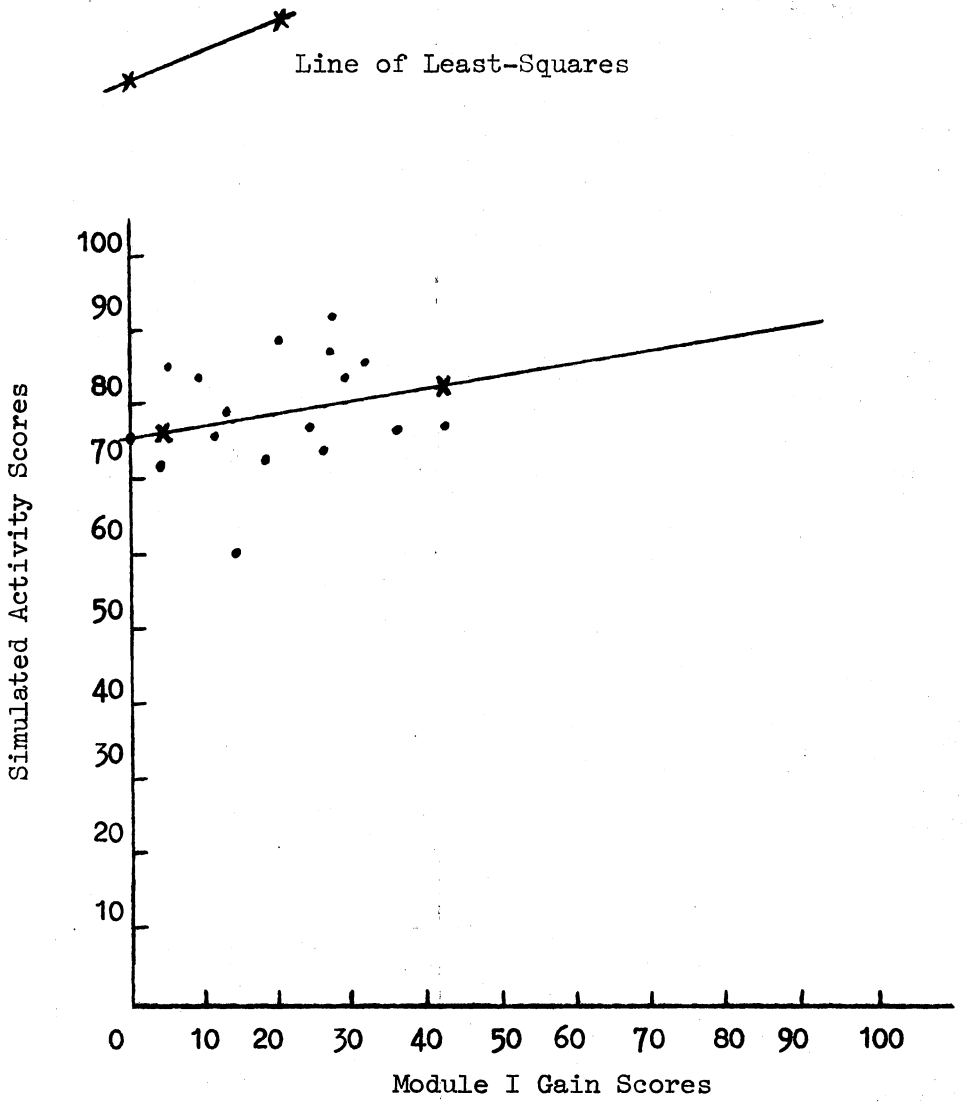

Figure 6. Scattergram and Least-Squares Line for the Module I Gain Scores and the Simulated Activity Scores

Hypothesis Four

In the fourth hypothesis it was stated that there would be no significant correlation between the Module II gain scores and the simulated activity scores. A scattergram and least-squares line for the Module II gain scores and the simulated activity scores are presented in Figure 7.

The standard error for these scores was 7.64. This meant that on the average there was an error of 7.64 units in the predicted Module II gain and simulated activity scores from the observed Module II gain and simulated activity scores.

The Pearson correlation coefficient was .3050 for the Module II gain and simulated activity scores. This coefficient does not indicate a very strong relationship. The relationship is positive, indicating that as the simulated activity score increases, the Module II gain score tends to increase; or as one decreases the other tends to decrease. The coefficient does not appear to be statistically significant at the .05 level. The fourth null hypothesis was not rejected.

Relationship Between Students' Backgrounds and Application Levels

The seventeen students completing the simulated activity were studied in regard to their background questionnaire. Presented in Appendix K is a comparison of students' background experiences with their simulated activity scores.

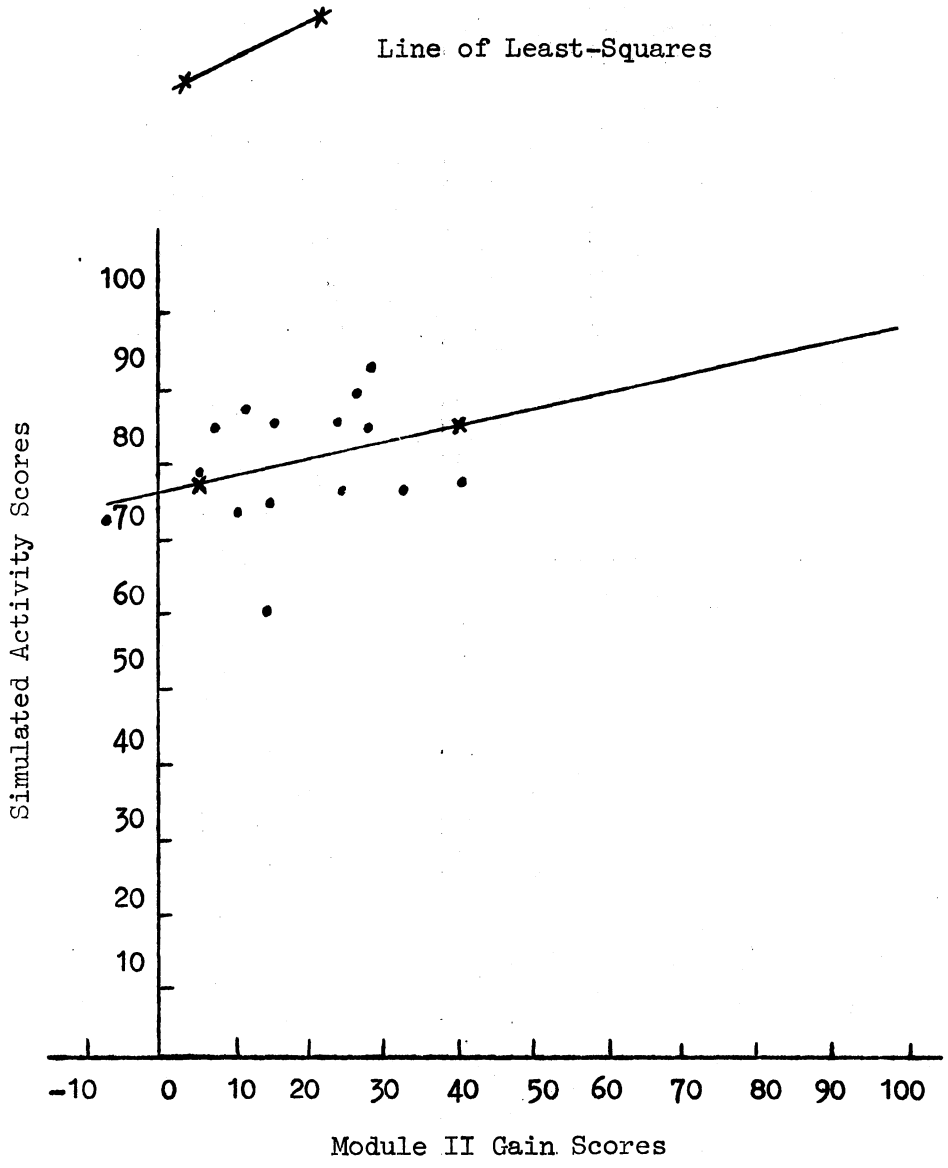

Figure 7. Scattergram and Least-Squares Line for the Module II Gain Scores and the Simulated Activity Scores

Two of the seven students scoring above the mean on the simulated activity were at the time employed in a retail clothing store and had sold women's dresses, coats and sportswear. Three of the seven had had previous courses which presented information about the use of design principles. All seven students indicated they had previously been aware of figure types and problems in relation to their own or other's figure, which may have been reflected in their scoring above the mean on the simulated activity.

Four of the ten students scoring below the mean on the simulated activity had previously sold at least one type of women's merchandise, either dresses, coats or sportswear. Apparently the students' employment experiences did not affect the simulated activity score. Seven of the ten scoring below the mean had had previous course work related to the design principles, but this factor did not appear to help them score above the mean on the simulated activity. Nine of the ten students indicated they had previously been aware of figure types and problems in relation to their own or other's figure; however, this did not appear to be reflected in their simulated activity scores which were below the mean.

Recommendations for Revision of the Simulated Activity

The results of the item analysis, which are presented in Appendix L, indicated that several items on the simulated activity were of low difficulty and had little discriminating power. Six of the twenty mini-cases were found to have zero discriminating power and were at one extreme or the other in difficulty value. Eight of the

twenty mini-cases were not at extremes, but neither did they have what is considered to be a good level of difficulty or discriminating value. Considering the small sample size it is difficult to draw conclusions. It is suggested that these fourteen items be further examined in making revisions of the simulated activity and retested with a larger sample.

The student evaluation form provided further suggestions for revision of the simulated activity. The tabulation of the students' responses to each statement on the evaluation form appears in Appendix J. The responses to several of the statements have implications for revisions. These responses are in Table IV.

Thirty-three percent of the students did not feel the customer descriptions were adequate. One student suggested that more specific details be added about the entire figure rather than just one specific fact such as large hips. Several students commented that more variation might be added to the customer mini-cases. Suggestions on how to achieve these revisions are in Appendix M.

Forty percent of the students felt the principles were not always easy to understand. One student commented that some principles seemed to contradict each other. Suggested revisions which may eliminate this problem are in Appendix N.

Seventy-nine percent of the students felt the slides were not easy to see. This was basically the result of lighting problems in the room where the simulated activity was presented. The room was not dark enough for all slides to be seen clearly. Students commented that most slides were clear, but that due to the lighting

TABLE IV

STUDENTS' RESPONSES TO EVALUATION STATEMENTS

	Statements	N = 15[a] Yes	%	No	%
3.	Each customer mini-case was adequate in its description.	10	67	5	33
4.	The principles were easy to understand.	9	60	6	40
6.	The slides were clear and easy to see.	3	21	11	79
8.	The slides clearly related to the principles.	10	67	5	33
11.	The activity was too difficult.	1	7	14	93
12.	The activity was too easy.	8	57	6	43
13.	The activity was too long.	5	38	8	62
16.	I could have done better on the simulated activity if I had studied the modules more thoroughly.	13	87	2	13

[a]Not all students responded to each statement.

problem, some slides were hard to see. One student commented that some slides appeared too dark. Suggested revisions for the slide series are in Appendix O.

Thirty-three percent of the students indicated that the slides did not clearly relate to the design principles, but the students did not note specific examples. This may have been the result of not understanding the principles. It is suggested that the simulated activity be re-evaluated by a panel of judges to eliminate any slides which do not clearly relate to the design principles.

Only seven percent of the students felt the activity was too difficult, while fifty-seven percent of the students indicated the

activity was too easy. One student commented that the simulated activity was "average" in difficulty. Revising those mini-cases which had a low level of difficulty in the item analysis may resolve the problem of students describing the simulated activity as too easy.

Thirty-eight percent of the students felt the simulated activity was too long. One student commented that it was too much of the same thing, while another student stated that too many of the customer mini-cases were alike. The suggested revisions described in Appendix N and R may eliminate these problems.

Eighty-seven percent of the students indicated they could have done better on the simulated activity had they studied the modules more thoroughly. One student commented that she might have done better on the activity had she had more time. Other comments included that more variety might be used in the types of clothing presented in the slide series and that more youth oriented clothing might be presented in the slides. One student felt that much of the clothing presented in the slide series was for "older people." Suggested revisions in regard to these comments are in Appendix P.

Student responses to other questions on the evaluation form indicated that some of their background experiences were helpful in completing the simulated activity. Especially helpful were the previous selling experiences for two of the students and the previous course work related to the design principles for four of the students. Nine of the students felt that being aware of their own or other's figure problems made them more aware of certain design principles, and thus helped them in completing the simulated activity.

Although students made no suggestions related to revisions of procedure or format, it is the writer's suggestion that the simulated activity be presented in two parts, using two class periods. This would provide time to use the simulated activity as both an evaluation device and a learning experience. This might also eliminate student complaints of the activity being too long or complaints of not having enough time to finish the activity. Suggestions for how the simulated activity could be used as both an evaluation device and a learning experience are in Appendix Q.

In summary, the following revisions were recommended as a result of the item analysis, students' evaluations and the writer's observations: (1) revise the customer mini-cases to include more variety and a more detailed customer description; (2) revise the slides and replace those which are dark, are not clear or do not represent the design principles; (3) add more variety to the types of merchandise presented in the slide series and select styles appropriate for the intended audience; (4) restate or eliminate those principles which appear to be confusing or contradictory; and (5) reorganize the simulated activity to serve both as an evaluation device and a learning experience.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purposes of this study were to develop an instrument which would measure the ability of students to apply line and design principles to the selection of women's clothing and to study the relationship among the students' knowledge levels, application levels and related background experiences. The objectives of the study were: (1) to develop a simulated activity which measures students' application levels pertaining to the use of line and design principles in the selection of women's clothing; (2) to measure the knowledge levels and the application levels of students pertaining to women's wear line and design principles; (3) to study the relationship between students' knowledge levels and their application levels pertaining to women's wear line and design principles, and to consider selected factors in the students' backgrounds; and (4) to make recommendations for revision of the simulated activity.

A simulated activity was developed to measure the ability of students to apply line and design principles. The activity included 20 simulated selling situations and a series of 41 slides. Each selling situation was presented in the form of a customer mini-case and included a description of a figure type or problem. Each customer

mini-case provided an opportunity for students to select one or two principles that would apply to the figure type or problem and to select one or two slides that visually illustrated the most appropriate merchandise for the customer.

The sample was composed of 23 students enrolled in distributive education at C. E. Donart High School in Stillwater, Oklahoma, spring, 1977. Two modules related to women's wear line and design principles were completed by the students. Pretests were given before students studied each of the modules, and posttests were given afterwards. Following completion of the two posttests, the simulated activity was administered. The pretest, posttest and gain scores represented the students' knowledge levels, and the simulated activity scores represented the students' application levels. Seventeen of the 23 students completed the simulated activity, and the scores of these students were used in the analysis of the data.

The degree of correlation was investigated between the two groups of posttest scores and simulated activity scores and between the two groups of gain scores and simulated activity scores. The only significant correlation, at the .05 level, was found between the posttest scores on Module II and the simulated activity scores.

Suggestions for revision of the simulated activity were based on the responses to the student evaluation form, the item analysis and the writer's observation. The majority of the recommendations for revision were found to be in content rather than in procedures or format. Students' comments were generally favorable toward the simulated activity.

Conclusions

The correlation between the posttest scores for Module II and the simulated activity scores was significant at the .05 level. Thus, a relationship existed between the ability of the students to comprehend the line and design principles as presented in Module II and their ability to apply the principles in the simulated activity. In this study there was not a significant relationship between the ability of the students to recall the principles presented in Module I and their ability to apply the principles in the simulated activity. The writer concluded that the simulated activity was an effective evaluation instrument for the application level of the cognitive domain.

Recommendations

1. Revise the simulated activity; then repeat the study using a larger sample.

2. Develop simulated activities to measure students' applications of knowledge in other subject areas.

3. Develop a tape to accompany the simulated activity in order to provide a learning option for students with reading problems or other special needs.

4. Revise the simulated activity to be used as a learning experience for students, as well as an evaluation instrument.

5. Conduct further studies to develop instruments which help students to make applications of knowledge.

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APPENDIXES

APPENDIX A

FIGURE TYPES AND FIGURE PROBLEMS

The following figure types and figure problems were used in designing the simulated experiences.

Four Figure Types:

Tall, Full Figure

Tall, Slim Figure

Short, Full Figure

Short, Slim Figure

Six Figure Problems:

Full Hips

Small Hips

Full Bust

Small Bust

Wide Shoulders

Narrow Shoulders

APPENDIX B

BASIC DESIGN PRINCIPLES

The following design principles were used in developing the simulated experiences.

Lines

1. Vertical lines usually add height to the figure and give an illusion of slenderness.
2. Wide, vertical lines that are evenly spaced may add width to the figure.
3. Horizontal lines usually shorten the figure and give an illusion of width.
4. Narrow, horizontal lines that are evenly spaced may create an illusion of height and slenderness.
5. Vertical and horizontal lines combined within the same design usually give an illusion of added height if the vertical lines are dominant.
6. Vertical and horizontal lines combined within the same design give an illusion of added width if the horizontal lines are dominant.
7. Diagonal lines may assume the characteristics of either the vertical or horizontal lines, depending on the degree of their slant.
8. Zigzag lines tend to add width to the figure and may shorten the figure if the lines move in a horizontal direction.
9. Curved lines usually add width to the figure.

Colors

10. Warm colors tend to increase the apparent size of the figure.
11. Cool colors tend to decrease the apparent size of the figure.
12. White, bright and light colors tend to increase the size of the figure.
13. Black, dark and dull colors tend to decrease the size of the figure.
14. Color contrasts tend to add width to the figure when they are in a horizontal direction.
15. Color contrasts tend to add height to the figure when they are in a vertical direction.

Textures

16. Shiny textures tend to increase the size of the figure.
17. Dull textures tend to decrease the size of the figure.
18. Smooth, firm textures tend to be slenderizing for the figure.
19. Rough, bulky textures tend to add weight to the figure.
20. Stiff textures tend to increase the size of the figure but may hide figure problems.
21. Clinging textures tend to reveal figure problems.

APPENDIX C

EVALUATION CHART OF SLIDES

DIRECTIONS: Rate the following slides as to whether or not each slide represents the principle which follows the slide's number. Place a check mark in the appropriate block to the right of each principle. Feel free to write in any comments or additional principles which you feel apply.

Slide No.	Principle	Yes	No	Undecided
1.	Warm colors tend to increase size.			
	a. Black, dark and dull colors decrease size.			
	b. Keep darker colors to the bottom, lighter colors to the top (for large hips).			
3.	a. Horizontal lines usually add width to the body and shorten height.			
	b. Horizontal color contrasts give an appearance of larger width.			
4.	a. Vertical lines usually add height to the body and are slenderizing.			
	b. Vertical color contrasts tend to add height.			
5.	a. Vertical lines usually add height.			
	b. Smooth, firm fabrics are slenderizing.			
6.	a. Horizontal lines usually add width to the body and shorten height (for small hips).			
	b. As a horizontal line crosses the body, the eye tends to measure the width of that area.			
7.	a. Horizontal lines usually add width to the body and shorten height (for small bust).			
	b. As a horizontal line crosses the body, the eye tends to measure the width of that area.			
8.	a. Dull textures decrease size.			
	b. Smooth, firm fabrics are slenderizing.			
9.	a. Vertical lines which are repeated with a large amount of space between the lines may add width.			
	b. Sharp contrasts draw more attention than slight.			
10.	Curved lines usually create the illusion of width or fullness.			
11.	a. White, bright and light colors increase size (for small hips).			
	b. Black, dark and dull colors decrease size (for large bust)			
12.	a. Curved lines usually create the illusion of width or fullness (for small bust or narrow shoulders).			
	b. Curved lines, if not exaggerated, may be flattering.			
13.	Horizontal lines usually add width to the body and shorten height (for small bust or tall slim figure).			

Slide No.	Principle	Yes	No	Undecided
14.	a. Violet has an equal amount of warm and cool coloring, but is cool when blue is more predominant than red.			
	b. One color outfits are most slenderizing.			
15.	Evenly spaced, horizontal lines placed close together may give an illusion of height.			
16.	Warm colors tend to increase size.			
17.	Green has an equal amount of warm and cool coloring, but is cool when blue is more predominant than yellow.			
18.	Black, dark and dull colors decrease size.			
19.	Shiny or glossy textures increase size.			
20.	Horizontal lines usually add width to the body and shorten height (for narrow shoulders).			
21.	White, bright or light colors increase size.			
22.	Narrow stripes are less dominant than wide stripes.			
23.	Cool colors tend to decrease size.			
24.	Warm colors tend to increase size.			
25.	White, bright and light colors increase size.			
26.	A plaid combining vertical and horizontal lines will give the illusion of added width if the horizontal lines are dominant.			
27.	White, bright and light colors increase size.			
28.	Cool colors tend to decrease size.			
29.	Warm colors tend to increase size.			
30.	Horizontal lines usually add width to the body and shorten height.			
31.	Evenly spaced, wide vertical stripes create an illusion of width.			
32.	Horizontal lines usually add width to the body and shorten height.			
33.	Evenly spaced, horizontal lines placed together may give the illusion of height.			
34.	Zigzag lines appear to increase apparent body size and if they move in a horizontal direction, may also shorten height.			
35.	a. Clinging textures reveal figure problems.			
	b. Shiny or glossy textures increase size.			
	c. Curved lines usually create the illusion of width or fullness.			
36.	a. Unevenly spaced horizontal lines create the illusion of width (for small bust).			
	b. Black, dark and dull colors decrease size (for large hips).			
37.	a. One color outfits are most slenderizing.			
	b. Black, dark and dull colors decrease size.			
38.	White, bright and light colors increase size.			
39.	Curved lines usually create the illusion of fullness or width (for small bust).			

Slide No.	Principle	Yes	No	Undecided
40.	a. Zigzag lines appear to increase apparent body size.			
	b. White, bright and light colors increase size.			
41.	White, bright and light colors increase size.			
42.	a. Stiff textures tend to increase size.			
	b. Horizontal lines usually add width to the body and shorten height.			
	c. Warm colors tend to increase size.			
43.	Dull textures decrease size.			
44.	A plaid combining vertical and horizontal lines will give the illusion of added width if the horizontal lines are dominant.			
45.	Black, dark and dull colors decrease size.			
46.	a. Stiff textures increase size.			
	b. White, bright and light colors increase size.			
47.	Rough, bulky and heavy textures add weight to the body.			
48.	Vertical lines which are repeated with a large amount of space between the lines may add width.			
49.	Curved lines, if not exaggerated, may be flattering.			
50.	Vertical color contrasts tend to add height.			
51.	Diagonal lines in a vertical direction may be slenderizing.			
52.	Diagonal lines in a vertical direction may tend to make wide shoulders look narrow.			
53.	Diagonal lines in a vertical direction may tend to make wide shoulders look narrow.			

APPENDIX D

DESCRIPTION OF SLIDES

Slide No.	Description	Principle Represented*
1	Department Title Slide - Dresses	
2	One-piece dress, orange	Color - 10
3	One-piece dress, black skirt and tan bodice	Color - 13
4	One-piece dress, black and white horizontal stripes	Line - 3 Color - 4
5	Two-piece outfit, dress, gray, full-length jacket, gray tone vertical stripes	Line - 1
6	One-piece dress, white, tan, green and black vertical stripes	Line - 15
7	Two-piece dress, gray with orange and white horizontal stripes at the hipline	Line - 3, 14
8	One-piece dress, wide white, orange and black vertical stripes	Line - 2
9	One-piece dress, rust, peach and beige tones	Line - 9
10	One-piece dress, white full skirt and dark brown bodice	Color - 12, 13
11	One-piece dress, tan horizontal stripes on yoke	Line - 3
12	Long, one-piece dress, blue and white horizontal stripes	Line - 4
13	Long, one-piece dress, black and white zig-zag design	Line - 8
14	Long, one-piece dress, shiny pink	Texture - 16
15	Long, two-piece dress, skirt, black, jacket and bodice, black and white horizontal stripes	Line - 3 Color - 13
16	Long, one-piece dress, black	Color - 13
17	Long, one-piece dress, light pink shades	Color - 12
18	Long, one-piece dress, beige with curved ruffles at the neckline	Line - 9
19	Long, one-piece dress, bright green and yellow pattern	Color - 10 Texture - 21
20	Long, one-piece dress, red with a stiff ruffle at the neckline	Texture - 20
21	Department Title Slide - Coats	
22	Three-quarter length coat, mauve, dull, smooth texture	Texture - 17, 18

*Numbers correspond with principles listed in Appendix B.

Slide No.	Description	Principle Represented*
23	Full-length coat, plaid with horizontal lines dominant	Line - 6
24	Three-quarter length coat, navy	Color - 11
25	Three-quarter length coat, white stiff texture	Color - 12 Texture - 20
26	Three-quarter length coat, bulky rabbit fur	Texture - 19
27	Department Title Slide - Sportswear	
28	Slacks, navy	Color - 11
29	Slacks, red	Color - 10
30	Slacks, red plaid with horizontal lines dominant	Line - 6
31	Slacks, white with blue vertical line on side seams	Line - 1 Color - 12
32	Sweater, light blue cardigan	Color - 11, 12
33	Sweater, red turtleneck	Color - 10
34	Sweater, black and white cardigan with wide vertical stripes	Line - 2
35	Sweater, multicolor pullover with wide horizontal stripes	Line - 3
36	Long sleeve blouse, yellow	Color - 10
37	Long sleeve blouse, navy	Color - 11
38	Long sleeve blouse, gold, shiny texture	Texture - 16
39	Long sleeve blouse, multicolor horizontal stripes on yoke	Line - 3
40	Long sleeve blouse, gray and white vertical stripes	Line - 1
41	Long sleeve blouse, gray and white diagonal lines which slant in a vertical direction	Line - 7

*Numbers correspond with principles listed in Appendix B.

APPENDIX E

INSTRUCTIONS FOR THE SIMULATED ACTIVITY

You have learned many principles relating line, color and texture to various figure types and figure problems. The principles may be very valuable to you in selecting clothing that would flatter or minimize any figure characteristics that need special attention. The purpose of this activity is to help you see the relationship between the design principles and the actual merchandise you may see in the store where you work. This activity gives you an opportunity to see if you can select merchandise for different customer figure types and figure problems.

Twenty customer mini-cases are described on the following pages. Included in the mini-cases are four figure types and six figure problems:

Figure Types	Figure Problems
1. Tall, full	1. Full hips
2. Tall, slim	2. Small hips
3. Short, full	3. Full bust
4. Short, slim	4. Small bust
	5. Wide shoulders
	6. Narrow shoulders

You will need to complete the following steps for each mini-case:

1. Read the customer mini-case.
2. Select one or two design principles that apply to the customer type described in the mini-case.
3. View several slides.
4. Select one or two slides that represent the most appropriate garments for the customer, based on the design principle(s) selected previously.

The slides you will be viewing are arranged to represent three departments in a women's clothing store: 1) the dress department, 2) the coat department and 3) the sportswear department. Imagine as you view the slides that this is the store in which you work. You work in all three departments. You may sell dresses, coats and sportswear. The customer mini-cases describe various customers that you might help in your store. Each case will explain the customer's figure type or figure problem and indicate what the customer is shopping for. You need to know which design principles may be used to flatter your customers in order to select the merchandise which best represents the application of those principles. All decisions should be based on your knowledge of the design principles.

Now turn the page and carefully read the directions. An example is provided in order to help you understand how to complete each customer mini-case included in this visual activity.

DIRECTIONS: Read the customer mini-case carefully. Below each mini-case will be a list of design principles and the numbers for each slide you will view. Based upon the customer mini-case:

1. Place a check mark (√) in the blank space by the principle(s) that should be followed when selecting merchandise for the customer.
2. View the slides and place a check mark (√) in the blank space by the slide(s) that best represent the principle(s) you selected. Select one slide for each principle you check.

NOTE: In some cases you may have two correct principles and two slides, but do not check more than two.

EXAMPLE: CUSTOMER MINI-CASE

Dress Department - Small Bust

Gwen is in your store shopping for a dress. Her main concern is finding a dress that appears to add fullness to her small bust.

First: Check the principle(s) you should keep in mind when selecting the dress(es) for Gwen:

____a. Dark colors tend to increase the apparent size of the bust.
__✓__b. Horizontal lines tend to give an illusion of width to the small bust.
__✓__c. Warm colors tend to increase the apparent size of the bust.
____d. Vertical lines lead the eye up and down, away from the bust.

Second: Check the slide number(s) representing the most flattering dress(es) you could select for Gwen, based upon the principle(s) you checked above:

__✓__2.
____5.
____10.
__✓__11.

The slides will be shown once. Raise your hand if you desire to see the slides a second time. There will be no talking or questions asked during the activity. If you have no questions to ask now, turn to the next page and begin. Do not omit any of the mini-cases. It is important that you make some response to the customer's problems.

APPENDIX F

EXAMPLES OF CUSTOMER MINI-CASES

CUSTOMER MINI-CASE #1

Dress Department - Full Bust Customer

Mary is shopping for a dress. Her concern is to find a dress that would be flattering for her large bust. She does not want to further emphasize the size of her bust.

Check the principle(s) you should keep in mind when selecting the dress(es) for Mary:

_____a. Horizontal lines tend to decrease the apparent size of the bust.
_____b. Dark colors tend to decrease the apparent size of the bust.
_____c. Vertical lines tend to decrease the apparent size of the bust.
_____d. Warm colors tend to decrease the apparent size of the bust.

Check the slide number(s) representing the most flattering dress(es) you could select for Mary, based upon the principle(s) you checked above:

_____2.
_____4.
_____5.
_____10.

CUSTOMER MINI-CASE #2

Dress Department - Small Hip Customer

Sherry is shopping in your store for a dress. She's looking for a dress that will add fullness to her small hips.

Check the principle(s) you should keep in mind when selecting the dress(es) for Sherry:

_____a. Contrasting a darker color below the waist tends to increase the size of small hips.
_____b. White tends to increase the size of small hips.
_____c. Horizontal lines tend to increase the width of small hips.
_____d. Vertical lines lead the eye up and down, away from the small hips.

Check the slide number(s) representing the most flattering dress(es) you could select for Sherry, based upon the principle(s) you checked above:

_____3.
_____5.
_____7.
_____10.

APPENDIX G

RESPONSES TO STUDENT EVALUATION (PILOT TEST)

	N = 6*	Yes	No
1.	The introduction to the activity was clear.	6	0
2.	The directions were easy to understand.	5	1
3.	Each customer mini-case was adequate in its description.	4	1
4.	The principles were easy to understand.	5	1
5.	I recognized the principles as being those I studied in the modules.	5	1
6.	The slides were clear and easy to see.	5	0
7.	There was enough time to view each slide.	6	0
8.	The slides clearly related to the principles.	6	0
9.	The activity was interesting.	6	0
10.	The activity was helpful in applying the design principles to the merchandise and the customers' figures.	6	0
11.	The activity was too difficult.	0	6
12.	The activity was too easy.	0	6
13.	The activity was too long.	0	6
14.	The activity was realistic.	4	2
15.	I would enjoy visual activities similar to this in other subject areas.	6	0
16.	I could have done better on the visual activity if I had studied the modules more thoroughly.	4	2

*Not all students responded to each statement.

APPENDIX H

STUDENT BACKGROUND QUESTIONNAIRE

Student's Name:_____

Grade Level:_____Age:_____

DIRECTIONS: Please answer the following questions by circling either the yes or the no.

Work Experience in a Retail Clothing Store

1. Are you presently employed in a retail clothing store?

Yes No

2. Have you ever sold the following types of merchandise:

Women's Dresses Yes No

Women's Coats Yes No

Women's Sportswear Yes No

Previous Course Work

3. Have you previously had any courses that presented information about the use of design principles related to line, color, and texture?

Yes No

Personal Information

4. Have you previously been aware of figure types and figure problems in relation to your own figure or some other person's figure?

Yes No

APPENDIX I

COMPOSITE SCORE SHEET

	Module I			Module II			
Students[a]	Pretest	Posttest	Gain	Pretest	Posttest	Gain	Simulated Activity
1	71	98	27	75	87	12	87
2	62	89	27	48	77	29	92
3	73	82	9	69	77	8	84
4	47	51	4	48	42	- 6	71
5	60	65	5	50	75	25	85
6	53	82	29	54	83	29	84
7	71	91	20	67	94	27	89
8	60	78	18	60	71	11	73
9	53	89	36	50	75	25	76
10	29	71	42	67	73	6	77
11	67	78	11	50	83	33	76
12	60	84	24	42	83	41	77
13	60	91	31	71	87	16	85
14	67	93	26	56	71	15	74
15	62	76	14	56	71	15	60
16	40	53	13	58	0[b]	0[b]	79
17	42	42	0	0[b]	63	0[b]	76

[a]Pretest, posttest and gain scores for the 17 students who completed the simulated activity.

[b]One student's pretest score and one student's posttest score was not obtained, therefore the gain score could not be calculated for these two students.

APPENDIX J

STUDENT EVALUATION FORM AND RESPONSES

Thank you for completing the visual activity designed in research. Your honest reactions to the following statements will help in evaluating the activity. Respond to each statement by putting a check mark in the appropriate box at the right.

Check List	N = 15*	Yes	No
1.	The introduction to the activity was clear.	13	1
2.	The directions were easy to understand.	12	3
3.	Each customer mini-case was adequate in its description.	10	5
4.	The principles were easy to understand.	9	6
5.	I recognized the principles as being those I studied in the modules.	13	1
6.	The slides were clear and easy to see.	3	11
7.	There was enough time to view each slide.	15	
8.	The slides clearly related to the principles.	10	5
9.	The activity was interesting.	10	3
10.	The activity was helpful in applying the design principles to the merchandise and the customers' figures.	13	2
11.	The activity was too difficult.	1	14
12.	The activity was too easy.	8	6
13.	The activity was too long.	5	8
14.	The activity was realistic.	12	3
15.	I would enjoy visual activities similar to this in other subject areas.	10	4
16.	I could have done better on the visual activity if I had studied the modules more thoroughly.	13	2

Suggested Revisions and Comments

17. If you have any suggestions for improving the Visual Activity, please list below:

18. If you have had previous experience in selling women's dresses, coats, or sportswear, do you feel it helped you in completing the visual activity? (Please comment.)

19. If you have had previous course work (other than the modules) related to women's design principles, do you feel it helped you in completing the visual activity? (Please comment.)

20. If you or someone you know have any figure problems that have made you aware of certain design principles, do you feel it helped you in completing the visual activity? (Please comment.)

*Not all students responded to each statement.

APPENDIX K

COMPARISON OF STUDENTS' BACKGROUNDS AND SIMULATED ACTIVITY SCORES

Student	Simulated Activity Score	Presently Employed	Previously Sold			Previous Courses	Aware of Figures
			Dresses	Coats	Sportswear		
1	85	Yes	Yes	Yes	Yes	Yes	Yes
2	87	Yes	Yes	Yes	Yes	Yes	Yes
3	92	No	No	No	No	Yes	Yes
4	84	No	No	No	No	No	Yes
5	85	No	No	No	No	No	Yes
6	84	No	No	No	No	No	Yes
7	89	No	No	No	No	No	Yes
8	76	Yes	No	No	No	Yes	Yes
9	77	Yes	No	No	No	Yes	Yes
10	73	No	No	No	No	Yes	Yes
11	60	No	No	No	No	Yes	Yes
12	79	No	No	No	No	Yes	Yes
13	71	Yes	No	No	Yes	Yes	Yes
14	76	Yes	Yes	No	Yes	Yes	Yes
15	74	Yes	No	Yes	Yes	No	Yes
16	77	Yes	No	No	No	No	Yes
17	76	Yes	No	Yes	Yes	No	No

APPENDIX L

ITEM ANALYSIS RESULTS

Customer Mini-Case Number	Difficulty Value	Discrimination Value
1	.90	.20
2	.80	.40
3	1.00	0
4	.90	.20
5	.90	.20
6	1.00	0
7	.10	.20
8	.20	.40
9	1.00	0
10	.10	.20
11	.30	.60
12	1.00	0
13	.90	.20
14	0	0
15	.50	.20
16	.70	.60
17	.10	.20
18	1.00	0
19	.70	.60
20	.40	.40

APPENDIX M

SUGGESTED REVISIONS OF CUSTOMER DESCRIPTIONS

Students expressed a desire for a more detailed customer description and for more variety in each mini-case. An example of the customer description in a present mini-case is:

Sportswear Department - Full Hip Customer

Patti is shopping for a pair of slacks. Her main figure problem is her full hips. She hopes to find a pair of slacks that tends to decrease the apparent width of her hips.

In revising the customer mini-cases, it is suggested that a more detailed written description be included about each customer. In addition to the written description, it is suggested that the customer's figure be visually represented, either with a sketch or slide.

To add more variation to the mini-cases, new aspects could be introduced into each mini-case, such as the season, holiday or occasion which might influence the customer's shopping.

An example for a revised mini-case, including a customer sketch, is:

Sportswear Department - Full Hip Customer

Patti is shopping today for a pair of slacks. Her main figure problem is full hips. She is tall and nicely proportioned, with the exception of her hips. Her small waistline accentuates her hips to look even larger. She hopes you will select some slacks from your stock which will not call attention to her full hips.

Place sketch of Patti here

The important thing to remember in expanding each case is that it is the figure type or problem that must be focused on as the main reason for selecting the proper principle and slide. Underlining the customer figure type or problem may help the student select the principle and slide that is appropriate for the customer's figure.

APPENDIX N

SUGGESTED REVISIONS OF DESIGN PRINCIPLES

Students indicated that some of the design principles were confusing or contradictory. One principle students mentioned in light of this was: curved lines usually add width to the figure. The modules explained that extreme curves may add width, while slight curves may be flattering. The students were undecided as to which curved lines were extreme and which were slight. Curved lines may range from the curve on a collar to circular patterns on a fabric. It is suggested that the module or design unit preceding the simulated activity include more information about curved lines, along with several illustrations, or eliminate the subject from both the unit of study and the simulated activity.

Diagonal, vertical and horizontal lines may have been confusing since each can have opposite effects, depending on the fabric design. For instance, vertical lines are usually slenderizing, but if they are wide and evenly spaced, they may add width to the figure. It is suggested that more examples be illustrated for each principle. A more detailed unit in line and design principles may be desirable.

Note: Suggested revisions of slides which relate to these principles are in Appendix O.

APPENDIX O

SUGGESTED REVISIONS OF SLIDES

Slide No.	Description	Problem with Slide
1	Department Title Slide, Dresses	The slide was handmade and not as realistic as the other two title slides which were actually taken in a store.
5	Two-piece outfit, dress, gray, full-length jacket, gray tone vertical stripes	The slide was confusing due to the bulkiness of the dress which added weight, and yet the vertical lines tended to be slenderizing.
8	One-piece dress, wide, white, orange and black vertical stripes	The slide was confusing as to whether the vertical lines added width or slenderized.
9	One-piece dress, rust, peach and beige tones	The slide was confusing as to whether the curved lines were slight or extreme curves.
12	Long, one-piece dress, blue and white horizontal stripes	The slide was confusing as to whether the stripes were narrow enough to lead the eye up and down.
13	Long, one-piece dress, black and white zig-zag design	The slide was confusing due to the untypical zig-zag pattern.
18	Long, one-piece dress, beige with curved ruffles at the neckline	The slide was confusing as to whether the ruffle represented a curved line.
22	Three-quarter length coat, mauve, dull, smooth texture	The slide appeared very dark when the room was light at all.
25	Three-quarter length coat, white, stiff texture	The slide did not clearly illustrate a stiff texture to some students.
30	Slacks, red plaid with horizontal lines dominant	The slide was confusing as to whether the vertical or horizontal lines were dominant.
34	Sweater, black and white cardigan with wide vertical stripes	The slide was confusing as to whether it increased or decreased size, since wide vertical stripes increase size and black decreases size.
40	Long sleeve blouse, gray and white vertical stripes	The slide was not clear as the stripes were so narrow the gray and white blended together at a distance.

APPENDIX P

SUGGESTED REVISIONS OF TYPES OF MERCHANDISE

Students made comments in regard to the styles of the merchandise presented in the slide series. The students for this study were juniors and seniors in high school. As one student commented, some of the clothes appeared to be for "older people."

To remedy this situation, new slides might be taken in various junior departments or jean shops which specialize in clothing that is youth oriented. If the intended audience can be identified, it is suggested that the slide series be developed from appropriate clothing for that audience. For instance, an adult audience probably shops in both women's and misses' clothing stores. Slides should be taken from women's and misses' clothing for this adult audience.

Students also suggested that more variety be added to the types of merchandise presented in the slide series. The following comparison suggests ways to add variety without adding length to the slide series.

Present Slide Series		Proposed Slide Series	
No. of Slides	Type of Merchandise	No. of Slides	Type of Merchandise
10	Short Dresses	6	Short Dresses
9	Long Dresses	4	Long Dresses
5	Coats	4	Coats
4	Slacks	4	Slacks
4	Sweaters	4	Sweaters
6	Blouses	4	Blouses
		4	Skirts
		4	Pantsuits
		4	Jumpsuits

Other types of merchandise, such as blazers or jackets, could be included in place of the proposed merchandise types, as long as the principles were illustrated. Separates, such as blouses or slacks, easily demonstrate principles which apply to specific figure problems. Garments which are full length, such as coats or dresses, are more appropriate in demonstrating the principles which apply to the basic figure types. It is necessary to keep in mind the figure types and problems and the design principles when selecting the variety of merchandise types to include.

APPENDIX Q

SUGGESTED REVISIONS OF PROCEDURES OF SIMULATED ACTIVITY

It is the writer's suggestion that the simulated activity be used both as an evaluative device and a learning experience. The present activity requires approximately 45-55 minutes to complete, or one regular class period. It is suggested that the activity be divided into two parts and two class periods be used.

One part of the simulated activity could be used in the first half of each of the two class periods to evaluate the students' application level. The second half of each of the two class periods could be used to maximize the students' learning experience. Students could review each mini-case, view the slides again and discuss the principles, figure types and figure problems.

The present simulated activity has twenty mini-cases. One option would be to divide the activity into two equal parts, with ten mini-cases in each. Another option would be to include the four figure types in one part of the test and the six figure problems in the other. Thus, the activity would have eight mini-cases in one part and twelve in the other.

VITA

Nancy Claire Muecke Peavler

Candidate for the Degree of

Master of Science

Thesis: DEVELOPMENT OF SIMULATED EXPERIENCES TO MEASURE APPLICATION OF WOMEN'S WEAR LINE AND DESIGN PRINCIPLES

Major Field: Clothing, Textiles and Merchandising

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Education: Graduated from Midwest City High School, Midwest City, Oklahoma, in May, 1969; received the Bachelor of Science degree from Oklahoma State University in December, 1972, with a major in Clothing, Textiles and Merchandising; completed the requirements for the Master of Science degree in Clothing, Textiles and Merchandising in May, 1977, at Oklahoma State University.

Professional Experience: Trim Buyer and Assistant to Vice-President at Gammon of Dallas, apparel manufacturer, Dallas, Texas, 1973-74; Fashion Merchandising Teacher-Coordinator at Draughon School of Business, Tulsa, Oklahoma, 1974; Assistant Manager at Streets, Windsor Hills Store, Oklahoma City, Oklahoma, 1974-75; graduate research assistant, Oklahoma State University, Stillwater, Oklahoma, 1975-77.

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