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TEACHING SELECTED CLOTHING CONCEPTS THROUGH INDEPENDENT
STUDY IN BEGINNING CLOTHING CONSTRUCTION

BY

JEANETTE C. SWEET

A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Major in
Home Economics Education, South Dakota
State University

1970

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CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
STATEMENT AND IMPORTANCE OF THE PROBLEM	2
DEFINITION OF TERMS	2
II. REVIEW OF LITERATURE	4
GENERAL AIM OF EDUCATION	4
CHARACTERISTICS OF LEARNERS	6
STYLES OF LEARNING	7
METHODS OF TEACHING	9
INDEPENDENT STUDY	14
STUDENT EVALUATION	17
SUMMARY	18
III. METHOD OF PROCEDURE	20
PROBLEM DEVELOPMENT	20
RESEARCH DESIGN	21
LIMITATIONS OF THE STUDY	28
IV. ANALYSIS OF DATA	30
USE OF INSTRUCTIONAL MEDIA	31
USE OF MEDIA FOR CONCEPT LEARNING	35
IMPROVEMENT FROM PRETEST TO POST-TEST	47
SIGNIFICANCE OF IMPROVEMENT SCORES	51
MEDIA AS RANKED FIRST IN USE AND HELPFULNESS.	54
V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	58
SUMMARY	58

CHAPTER	PAGE
CONCLUSIONS	60
RECOMMENDATIONS	61
VI. SELECTED REFERENCES	63
VII. APPENDIX	67

FIGURES

FIGURE	PAGE
1. AVERAGE IN TIME OF MINUTES SPENT BY EACH OF THREE ABILITY GROUPS USING SIX TYPES OF INSTRUCTIONAL MEDIA	33
2. AVERAGE TIME OF USE OF AUDIO TAPES BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS	35
3. AVERAGE TIME OF USE OF BOOKS AND READING REFERENCES BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS	37
4. AVERAGE TIME OF USE OF FILMSTRIPS AND/OR SLIDES BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS	39
5. AVERAGE TIME OF USE OF FLASHCARDS BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS	40
6. AVERAGE TIME OF USE OF MODELS BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS	41
7. AVERAGE TIME OF USE OF OVERHEAD TRANSPARENCIES BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS	43
8. MEANS OF IMPROVEMENT SCORES BY FOUR EVALUATORS SHOWING CHANGE FROM PRETEST TO POST-TEST FOR EIGHT CONCEPTS BY THREE ABILITY GROUPS	48

TABLES

TABLE	PAGE
I. SIGNIFICANCE OF THE MEAN IMPROVEMENT SCORES FROM PRETEST TO POST-TEST FOR THE THREE ABILITY GROUPS	53
II. NUMBER AND PERCENT OF SIX MEDIA RANKED FIRST BY USE AND RANKED FIRST IN HELPFULNESS BY STUDENTS	55

CHAPTER I

INTRODUCTION

Many educators today are faced with the dilemma of improving instruction in a growing program with minimum personnel and facilities. Home economics teachers are especially aware of this problem, since the nature of their field of study is continually being modified and expanded. This study came about as a result of the demands on one South Dakota home economics teacher to expand her program and continue to improve her instructional methods in an attempt to meet the needs of her students in a qualitative manner.

Homemaking is required in the eighth grade at Madison Junior High, Madison, South Dakota. This presents the teacher with a classroom organization which is heterogeneous. Within a limited class period, the teacher is confronted with the task of instructing the low, average, and high ability student. Thus, the problem of how to meet the needs of students with different levels of ability within each class is especially important at the junior high level where many of the courses taken by the students are required.

STATEMENT AND IMPORTANCE OF THE PROBLEM

The writer was concerned with providing instructional materials applicable to different levels of ability within a diversified or heterogeneous group. Special emphasis was placed on individual achievement through self-directed independent study with the aid of multi-media instructional materials.

The present study's major objective is to provide independent study instructional media that will help each student in a heterogeneous group to achieve selected concepts in beginning clothing construction. Thus, the purpose of this study is two-fold:

1. to provide six different types of instructional media by which each student can learn eight selected clothing concepts;
2. to help each student to achieve the eight selected clothing concepts in beginning clothing construction by utilizing the six types of instructional media in an independent study laboratory.

DEFINITION OF TERMS

To assist the reader in understanding the general theme and the ideas brought forth in this study, the following terms are defined.

Ability: (1) the actual power present in an organism to carry to completion any given act or to make adjustments successfully. (17:1)

Achievement: accomplishment or proficiency of performance in a given skill or body of knowledge. (17:7)

Grouping, heterogeneous: the classification of pupils for the purpose of forming certain groups having a high degree of dissimilarity. (17:256)

Iowa Tests of Basic Skills: tests devised to test functional skills of children in grades 3-9 in the areas of vocabulary, reading comprehension, language skills, work-study skills, and arithmetic. (10:16)

Multi-media: for the purposes of this study, this term is defined as media which are multiple in dimension, such as tactile, audio, or visual.

Self-instruction: for the purposes of this study, this term is defined as the teaching of one's self through available instructional media in a laboratory.

Self-paced learning: for the purposes of this study, this term is defined as learning which is paced to the individual's tempo of learning.

Study, independent: study carried on with a minimum or a complete absence of external guidance. (17:256)

CHAPTER II

REVIEW OF LITERATURE

A general background in education is important as a basis for understanding the areas introduced in this study. Because of the large amount of literature available, only the references pertinent to this study were selected. For clarification and continuity, the review of literature presented here is divided into the following areas: The General Aim of Education, Characteristics of Learners, Styles of Learning, Methods of Teaching, Independent Study, and Student Evaluation.

GENERAL AIM OF EDUCATION

Although authorities may vary as to their views of the general aim of education, clarification of some of these views is important for a better understanding of the general views of education.

The cultivation of excellence is perhaps the most generally accepted objective of education. Bruner (9) attempts to clarify this phrase when he describes it as referring not only to schooling the superior student, but

also to the achievement of optimum development by each student.

This differs from the humanistic approach described by Ausubel (4) which is quite rigid, academic, and authoritarian. Little attention is given to individual differences and developmental needs. The humanistic educator does not seriously attempt to motivate the child, encourage spontaneity or enlist the child's voluntary participation. Thus, there is no responsibility or directive role demonstrated by the learner in the educative process.

The objective now, it seems to many educators, is to devise materials that will provide for the optimum development of each student. Groeschell (18:417) states this belief in his discussion of the curriculum concerned with procedures and materials most suitable to the children being instructed:

. . . Instruction that is concerned with individual differences stresses the very personal nature of success experiences. This implies that we as teachers will be fulfilling our responsibility if children have a variety of successes, that there are not always uniform achievement expectancies, that one child may have mastered a skill before another is even ready to begin, and that the roles might be reversed on a second skill.

CHARACTERISTICS OF LEARNERS

As background for this study, characteristics, which describe pupils as low, average, and high in intellectual ability, need to be identified. Adix (1) summarizes some of the characteristics of each ability grouping and these are used as a frame of reference for this study.

The low ability pupil learns by simple mental processes and prefers concrete and practical instruction. He possesses limited powers of self-criticism, has difficulty in reasoning, and needs drill and repetition. He likes quick results and finds transfer of learning to other situations difficult. Frederich (13) defines the low ability student as a slow learner and expresses the belief that the slow learner's ability may consist of peaks and valleys, as he might be low in some areas and high in others.

The average ability pupil can plan, reason, experiment, generalize, and transfer learnings independently. He is imaginative, can relate general principles to specific situations, and individually solves problems.

The high ability pupil possesses analytical and evaluating powers. He learns rapidly and gains from abstracts. Observation and inductive reasoning are his patterns of learning. He can generalize and apply concepts to life situations and can demonstrate leadership qualities.

The basic differences between these types of learners have implications for selecting teaching methods and instructional media when working with pupils of varying abilities and divergent patterns of learning.

STYLES OF LEARNING

The writer is concerned with theories of learning, how pupils learn as individuals, and, within a group.

Piaget's (25) theory of how children learn is described as a process of assimilation, what is done to that which needs to be learned so that it can be learned, and accommodation, what the learner does within himself so that learning will take place. Through this process a pattern of behavior is established by the child. This pattern is called a schema, which is described as a behavior that is repeated and can be generalized. Each new experience alters the system of the individual's schemata. He further explains his theory by saying that each new mental ability is the incorporation of the world in a process of egocentric assimilation. Equilibrium is attained by the process of accommodation to reality. The adolescent believes that the world will submit itself to idealistic schemes rather than reality. The egocentricity of the adolescent gradually lessens with the reconciliation of reality and formal thought. When the adolescent

understands that the function of reflection is to predict and interpret experience rather than contradict it, then a balance is achieved.

A theory of learning which suggests an environment that provides the student with a generous amount of stimuli is presented by Groeschell (18). Learning takes place through the interaction of the child with his environment. Because one medium is not sufficient for all individuals, several media are more effective in reaching individuals within a group.

An essay by Knight (21) proposes to clarify and explain the psychological evidence for the inductive method of learning. He believes that when the learner is involved in the learning process, whether it be through induction, reflection, discovery, or inquiry, he is more motivated to learn and has a better chance of understanding and retaining materials than a student who learns under a system of rote instruction.

Some educators and guidance workers tend to focus their attention on emotions, personality, and motivation. Thus, they ignore the concept of different styles of learning. How pupils learn can be improved by concentrating on the way they work and learn. Reissman (29) believes that some students learn easily through reading, some through listening, and others by actually doing things.

In any classroom, it is unlikely that any two individuals learn the identical things, in the same manner, at the same rate. In a study of the effectiveness of the use of the overhead projector in teaching clothing construction, Stam (34) asserts that although learning involves all of the senses, the largest number of impressions is received best through the eye and that the learner best perceives, retains, and creates a mental picture for future recall through visual learning.

Grouping procedures that provide opportunities for success are being met with flexible groupings that emphasize each child's success. This stresses Allen's (3) belief that every child individualizes his learning whether this is desired or not.

METHODS OF TEACHING

There has been an increased emphasis on motivation and experience that has profound implications for educators. To write off certain children as hopeless and others as capable of only mediocre performance is a temptation, which, according to Backman and Secord (5) should be resisted by teachers. These actions are most likely to lead to a "self-fulfilling prophecy" - the teacher's expectations predetermining mediocre performance. The above authors say that for such children methods

need to be found to generate their interest in the subject matter and to provide them with experiences of which they have been deprived.

Spitz (33) believes problem solving and learning depend upon the exploration of alternatives; therefore, instruction needs to facilitate and regulate exploration of alternatives for the learner. This type of instruction can help students to improve their ability to think, to question, and to solve problems independently.

Hopefully, when a teacher decides what techniques or methods or strategies to use, he has quite a repertoire at his command. Spitz (33:132) states that perhaps he should ask himself these questions when making his choice:

1. What are the needs of my students?
2. Which methods will enable each of my students to experience success?
3. Which ones will develop independence in my students?

Groeschell (18:418) emphasizes the advantage of many alternatives in his statement:

. . . Instructional procedures that involve pupils in more than one kind of learning situation seem desirable for caring for individual differences. The imaginative teacher combines multiple resources with highly challenging and significant learning activities.

Short (31) devised a self-instructional laboratory for a beginning foods laboratory. Students were permitted to use the multi-media approach and proceed at their own pace. The results of this laboratory lead to the conclusion

that the variety and use of self-instructional materials can be more effective than the type of laboratory that is lecture-demonstration taught by the teacher.

Georgiady, Nicholas, and Romano (16) relate results of the Wisconsin Shorewood and Whitefish Bay Public Schools Multimedia Learning Investigation. They identify the positive effects of learning by utilizing several audio-visual materials in reinforcing individual learning as measured by vocabulary changes. Their conclusions indicate that a variety of audiovisual materials are significant in improving learning and should be used throughout an entire unit of study.

The integrated-experience approach is described by Postlethwait (27) as one which places emphasis on student learning rather than on the mechanisms of teaching. He believes the teacher should first identify clearly the concepts, manipulatory skills, and responses to be achieved by the student and then design a multi-faceted, multi-sensory approach to enable the student to attain these objectives. His integrated-experience approach includes audio-tutorial taped presentations, lectures, reading materials, observations on demonstration set-ups, student experimentation, and any other activities helpful in assisting student understanding of the subject. Horn (19) agrees with the theory that the multi-media approach is more effective than using a single medium to communicate

all facets of a subject. She believes that when one single medium is used the concepts covered are often short-changed and not always presented most effectively. A multiple approach might contribute to a more thorough understanding of the subject and more responsiveness on the part of different individuals. From a study conducted by Maimes (23) on the audio-tutorial approach in comparison with the conventional methods of instruction, she recommends that the audio-tutorial method will provide an excellent means of individualizing instruction in home economics classes if used in combination with satisfactory learning experiences and other innovative ideas.

The multi-media approach has also been used by Walsh (37). A complete learning-resource package containing a wide variety of audio and visual media relating to various social studies units is the basis for this method of teaching. Work-period activities planned by the teacher are concerned with individual differences. Participation in total class experience is necessary so that each pupil feels that success is possible for what he is doing.

Guidelines for effective service to children, according to Chase (11:412) suggest that the teacher must:

1. Adapt instruction to various levels of ability.
2. Provide for different progress rates in learning.
3. Teach to specific points of weakness.
4. Encourage individual and group self-direction and initiative.

5. Enrich learning to make it significant and useful. Use a variety of related activities and instructional aids.

Shumsky (32) focuses on the role of the teacher in activating the learning and aiding in developing a climate of productive thinking. He stresses that the teacher does not teach "uniform" children but rather divergent individuals. Teaching should be directed toward the differences in academic potential, personality, and learning styles. Mather (24) also stresses the role of the teacher and believes that it is doubtful that educational media will replace the teacher. Of utmost importance in the teaching-learning situation is the personal interaction between teacher and student.

The old cliché, "We must treat all children alike," is expressed as nonsense by Frymier (14). He declares that each student is unique and teaching methods should be planned with an assessment of each student's motivation and abilities. This basic philosophy demands that we use differentiated teaching techniques to help the student learn. Koontz and others (22) believe that the stimuli that make individual learning attainable are derived from numerous sources that need humane and attentive teacher management.

INDEPENDENT STUDY

The variety of instructional media available for use in the independent study method prompts educators to investigate and utilize these media in learning situations. An attempt is made to identify some of the ways in which media can be used in independent study.

Alexander (2) draws attention to the current trend of focusing on the individual student. This is most clearly reflected in the growing emphasis on independent study. Only a portion of America's secondary schools utilize independent study, but expectations are for the number to increase manyfold in the next decade. He anticipates that this will aid in the development of self-directed learners which is a purpose of independent study.

Beggs (6) identifies and describes three levels of independent study. The first is guided study and involves a closed-end activity with teacher direction. The second level also represents a teacher directed situation; however, the assignment is left open-ended and there is no limit placed on what the student may do with the assignment. Students are given the opportunity to work at their own rate and ability. The highest level of independent study provides for individual pursuit and the student assumes the responsibility for identifying his topic.

In home economics, teachers are constantly searching for better methods of presenting materials to students. Teaching a skill in clothing construction often involves much valuable class time and repetition on the part of the instructor. Powers (28) suggests that teachers know the effectiveness of certain methods which will enable each student to develop a basic concept of the skill with the least amount of difficulty. According to Trump (35), students will have more time available for utilizing independent study facilities. They can view filmstrips, listen to recordings, read, and work on programmed-instruction devices. It is a basic assumption that through this process home economics can become a more vital subject. Hoban, Finn, and Dale (12) report that the correct use of audio-visual materials in a teaching situation can contribute to conceptual thinking, student interest, reality of experience, continuity of thought, growth of meaning, and provide learning experience not easily obtained through other means.

Plunkett (26:350) describes an independent study program developed at the request of several students at Syosset High School in New York. The following view of the students is addressed to the administration:

. . . the rigidities of group learning created lack of interest rather than dedication, conformity rather than curiosity and ennui rather than excitement that learning could generate.

The administration frequently asks for assistance when attempting to persuade teachers to experiment with some of the various approaches to independent study. Postlethwait (27) describes an independent study session which provides the student with an opportunity to engage in the kinds of activities which he can best accomplish autonomously. The program of learning is organized in such a manner that students can proceed at their own pace, filling in gaps, or omitting portions of the program of which they are already knowledgeable. A number of reasons, according to Brown (8:46), which would convince even the most ardent traditionalist that students could profit from an experience in independent study, are as follows:

1. Independent study provides a handy vehicle for overcoming the limitations of the regular school program.
2. The individual's tempo for learning comes into full play.
3. Independent study motivates the individual student to learn how to learn.
4. Students develop individualized styles and approaches to learning.
5. It gives every student an opportunity to pursue a project or research study in his own unique way.
6. Students have an opportunity to work alone, with a teacher available for resource assistance.

The essence of the matter is that the individual learner needs to be able to perform at his best; moving freely, lingering where it seems worthwhile, and hastening where it seems necessary to do so.

At Valhalla High School in Valhalla, New York, the independent study program has entered its fifth year. Students are freed from some traditional class time to carry out independent study projects. Some of the implications for secondary school improvement as seen in the Valhalla independent study program are cited by Richardson (30). He believes that procedures for independent study need to allow for awakening of interests and talents of students and aid in the development of resourcefulness and self-guided learning which will improve the student's future education and lifelong learning.

STUDENT EVALUATION

Independent study, as well as other types of teaching and learning, need to be evaluated. A fair evaluation of individual pupil achievement can prove to be a difficult task for many educators. Differences in children's characteristics, learning styles, and methods of teaching on the part of the teacher contribute to variables which can affect the evaluation process.

Groeschell (18) believes that narrow evaluation accompanies limited learning opportunities. Thus, basic instructional practices are most often linked with grading procedures based on single standards of achievement. A flexible system of grading based on individual growth

rather than uniform standards of achievement can provide for evaluation of each student's achievement.

The pace at which children learn is an individual matter. Shumsky (32) points out that a child's individual rate of learning is often confused with his capacity. A child who responds very slowly may learn no less than one who responds and absorbs rapidly.

Researchers are interested in accomplishment-performance which demonstrates ability. According to Keenan (20), I.Q. tests are not able to measure such variables as creativity, interest, or ambition, which influence accomplishment-performance and thus affect the total evaluation of student achievement. Waag (36) expresses the view that pupil evaluation is especially important at the junior high level because of the wide range of ability.

SUMMARY

Shumsky (32:164) summarizes the main areas of the literature selected with the following view:

. . . To enable each child to learn at the pace which would result in optimal learning, flexibility in scheduling, and allowances for individual tempo, variations need to be made in the classroom. This requires flexibility in class organization, curriculum development, and the guidance of the teacher-learning process.

Educators appear to be aware of the aim of education in order to allow for differentiated characteristics of learners and different styles or ways of acquiring knowledge. Some methods of teaching attempt to be adequate and flexible enough to allow for the success of each student. Independent study, as an example, attempts to give each student the opportunity to learn in his own individual manner. Student evaluation based on individual progress attempts to provide a true evaluation of the achievement of each child.

CHAPTER III

METHOD OF PROCEDURE

The study was designed to use various media for independent study in an attempt to identify specific media which could help students in a heterogeneous eighth grade homemaking class to achieve selected clothing construction concepts.

PROBLEM DEVELOPMENT

The writer had taught for several years in a heterogeneous classroom organization and was interested in a method of handling heterogeneity in a manner which permitted it to function to the benefit rather than the detriment of any segment of a group of learners within a heterogeneous grouping. It was not intended that any focus be given pupils of extreme intellect, namely, mentally retarded or gifted.

Professional readings and current emphasis in curriculum which provided for and brought attention to individual differences prompted the researcher to develop interest in the area of individual achievement.

As further background for working with pupils of varying abilities, the researcher studied and discussed the use of independent study with a homemaking teacher at another school. A visit was made to that department to observe classroom activities and particular attention was given to individual differences. Observation of these classes provided the writer with information concerning the following: how individualized instruction was carried out, management practices in that particular type of classroom, and approaches made in teacher guidance in a new teaching-learning situation. Distinctive pupil traits were also discussed and observed as the writer was interested in how individual students participated in independent study. All of these practices had relevance to the present study.

RESEARCH DESIGN

The study was seven weeks in duration, included four sections of eighth grade homemaking consisting of fifty-two subjects, and was taught through eight selected beginning clothing construction concepts which were presented during the construction of a cotton A-line skirt. Six different types of instructional media were utilized for teaching the selected concepts. The students were to be evaluated on the basis of individual progress in the

construction of the pretest half-scale muslin skirt¹ and the post-test cotton skirt. For further analysis, the students were divided into three ability groups on the basis of their scores on the Iowa Test of Basic Skills.

In preparation for the study, preliminary instruction was given to the students. There was instruction and testing on the basic operation of the sewing machine. The students cut and marked the half-scale muslin pretest skirt and the post-test cotton skirt in a lecture-demonstration laboratory taught by the supervising teacher. The eight concepts to be taught by independent study were introduced to the students by two student teachers and the supervising teacher.

The eight concepts in clothing construction were selected to teach the student how to construct a skirt in a beginning clothing construction class. Instructional media were prepared for each of the eight concepts. The eight concepts selected were:

1. Stay-stitch
2. Dart
3. Plain seam
4. Seam finish
5. Zipper
6. Facing
7. Hook and eye
8. Hem

¹For an illustration of the pretest, half-scale muslin skirt, refer to the Appendix, page 68.

The six types of instructional media² that were selected to aid in learning all of the previously mentioned eight selected concepts in clothing construction were:

1. Audio tapes
2. Books and reading references
3. Filmstrips and/or slides
4. Flashcards
5. Models
6. Overhead transparencies

The instructional media were placed in six different learning centers located in the homemaking department. The students were given instruction about the operation of each of the instructional media and were told that they were free to choose all, some, or none of the media when attempting to learn the eight clothing construction concepts. Time sheets³ were placed at each of the instructional media learning-centers and students were instructed to record the minutes spent each time they used the instructional media. Clocks were placed in convenient viewing places throughout the department. The time sheets were color coded to each class section and the names of all students were numbered and arranged in alphabetical order.

²For illustrations of the six types of instructional media refer to the Appendix, pages 69-71.

³For a copy of the data form used for the time sheets refer to the Appendix, page 72.

All of the concepts were listed on each of the time sheets. At the beginning of each week new time sheets were placed in each of the media learning-centers.

Some of the instructional media were teacher-prepared and some were commercial materials.⁴ The audio tapes, flashcards, models, and overhead transparencies were prepared by the teacher. The books and references were commercial materials. The filmstrips were commercially prepared with the exception of the slides which were prepared by the teacher.

The audio tapes⁵ were teacher-prepared for each concept and an attempt was made to coordinate their content with the other instructional media. The tapes told the student the name of the concept, when to begin listening for construction directions, and when the concept was finished playing. Each concept was taped onto a single reel twice and when the concept had been played through twice consecutively, the student was informed that it was time to rewind the tape. Each individual reel was marked with the concept and was available for student use until the end of the study.

⁴For a copy of the commercial instructional media sources refer to the Appendix, pages 73 and 74.

⁵For a copy of the script used for the concept of stay-stitching refer to the Appendix, page 75.

The books and reading references were selected from sources that the teacher felt were consistent with the other material and contained good explanations and clear illustrations. The portions to be read by the student were marked with colored marking pen. Two and/or three of the references were selected for each concept.

The filmstrips and/or slides were commercially prepared except for the concept of facing, which the teacher was unable to find. Slides were prepared by the teacher for the concept of facing. Selected frames on the commercial filmstrips which applied to the concepts in beginning clothing construction of a skirt were utilized. The frames which were not applicable to the concept, or were not desired, were blocked off with an "X" across the frame using a transparency pen. Instructions stated the concept and the frames the student needed to view. If instructions did not accompany the frames, these were written and placed by the number of the frames on the instruction sheet.

The flashcards were constructed on 9" x 12" colored construction paper giving the name of the concept and an association with that concept. An example would be the concept of dart, with a drawing of a dart as used in a dart game. The concept was then written again and the definition given. These were placed in a large file box.

The models were teacher-prepared and an attempt was made to keep the directions and example consistent with the other instructional media. Directions were given with the steps for each concept and the samples were numbered in order of their construction. They were sewn with cotton fabrics and contrasting thread. The models were attached at one end to a 9" x 12" piece of construction paper, but were left free enough for student examination.

The overhead transparencies were prepared by the instructor and were coordinated with the other instructional media and some commercial transparencies. They were prepared with colored transparency pens. The concept was placed at the top of the transparency and the necessary steps and directions were given for completion of the concept.

All of the instructional media were available for student use throughout the study. The standards of the clothing construction techniques were consistent for each media. The students had free choice of the instructional media and were not graded on time spent or their choice of media. They were self-paced through the entire study.

Since it had been established that each student learns differently, it was hoped that each student would accept one or more of the six types of instructional media that would help him to achieve success in the completion of

the eight selected clothing construction concepts. In order to facilitate success for each student a self-instruction laboratory was arranged in the homemaking department providing as much privacy as possible for use of each of the six instructional media. Each student then participated in the study by:

1. Constructing a pretest half-scale muslin skirt without direction from the teacher.⁶
2. Constructing a skirt by choosing from the multi-media provided in a self-instruction laboratory in the homemaking department.
3. Studying and working by the independent study method.
4. Recording the particular media utilized and the length of time it was used.

The homemaking department was accessible to the students for laboratory work during regularly scheduled classes in the morning, during study hall periods in the afternoon, as well as before and after school.

The pretest half-scale muslin skirt and the post-test cotton skirt constructed in the independent study clothing laboratory were evaluated by four judges. These individuals were: the teacher, the student teacher, a homemaking teacher from a neighboring school, and a former

⁶For a copy of the Pretest Instructions refer to the Appendix, pages 76-78.

home economics teacher. A number was attached to each skirt so that the names of students were anonymous to the evaluators. The same evaluation form was used for the pretest and post-test.⁷ The eight clothing concepts were rated by each of the four judges⁸ and a total score for the pretest and the post-test was given each student. Individual progress from pretest to post-test was the important factor in student evaluation.

LIMITATIONS OF THE STUDY

The writer realized that there were some limiting factors that would be a hindrance to and some that would strengthen the study. This study had the following characteristics which were common to action research projects: (1) carried out in a single homemaking department, (2) lack of a control group, (3) a small number of cases, (4) unpredictable variations in the schedule, and (5) differences in teacher attitude and/or ability. The results could be of limited scientific value, but still have meaning and value for the individual teacher completing the project. They could lead to improved teaching on the

⁷For a copy of the pretest and post-test evaluation form refer to the Appendix, pages 79-86.

⁸For pretest and post-test scores by each of the four judges, refer to the Appendix, pages 87-94.

part of the researcher and the sharing of the outcomes with others in that particular field. A factor which was of help to the teacher who carried on the action research was that of being a participant in the research. This is in contrast to the scientific research worker who strives to be an observer in an objective and unbiased manner.

According to Borg (7), the action research worker's zeal and ego-involvement in the research lead to more biased results which reduce the possibility of making generalizations from the research findings. These characteristics were considered by some educators to be desirable as they increased the probability that the teacher was learning how to better solve his own particular problems.

CHAPTER IV

ANALYSIS OF DATA

Throughout this study the researcher had sought to determine the effectiveness of independent study as a means of teaching eight selected clothing construction concepts by the utilization of six types of instructional media. Scores achieved on the Iowa Test of Basic Skills were used as a basis for grouping the fifty-two subjects into three ability groups of high, average, and low. The analysis of the performance of these three ability groups was based on their use, measured in time, of the instructional media and their progress in the eight concepts from the pretest to the post-test.

The six types of instructional media which were available for student use throughout the entire study were: audio tapes, books and reading references, filmstrips and/or slides, flashcards, models, and overhead transparencies. Student performance was then studied as to selection and use of the instructional media in general and for each of the eight selected concepts. Instructional media that ranked first according to student use, were

compared with the media ranked first by the student's attitude toward the media as to degree of helpfulness.

Student progress was determined by means of the ratings of the four evaluators. This progress was determined by the difference between pretest and post-test scores for each student on each of the eight selected clothing construction concepts: stay-stitch, dart, plain seam, seam finish, zipper, facing, hook and eye, and hem. The change from pretest to post-test was the factor which measured student improvement. Each of the three ability groups was then analyzed as to improvement on each of the eight clothing concepts. The t test was used to evaluate the significance of student improvement.

The fifty-two subjects were divided into three ability groups of high, average, and low, based on percentile ranks of scores achieved on the Iowa Test of Basic Skills. The high ability group consisted of the top quartile (13 subjects), the average ability group consisted of the middle quartiles (27 subjects), and the low ability group, the bottom quartile (12 subjects).

USE OF INSTRUCTIONAL MEDIA

The average of the time in minutes spent by each of the three ability groups, throughout the study, utilizing the six types of instructional media are arranged into

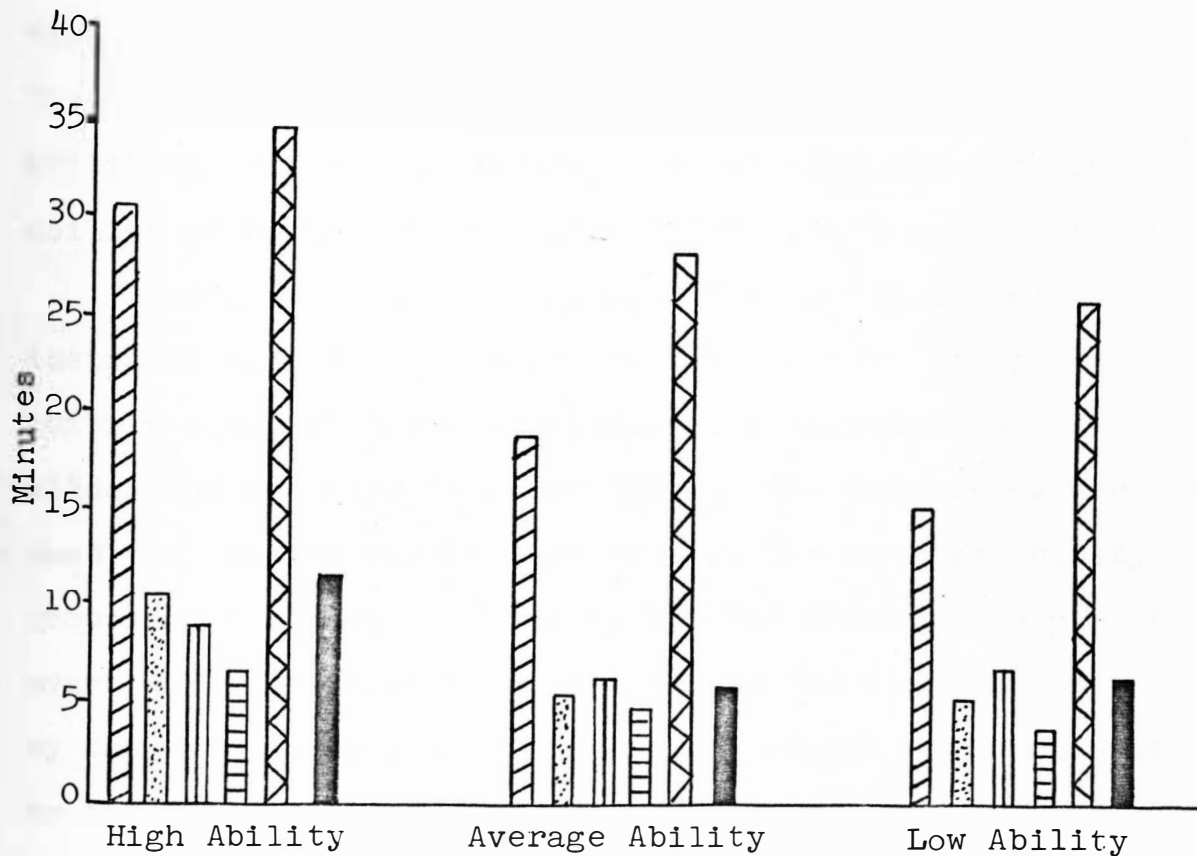
a bar graph in Figure 1. The media utilized most often by all three ability groups were (1) models and (2) audio-tapes. The models were used by the high ability group for about 35 minutes, by the average group for 29 minutes, and by the low ability group for 26 minutes. The high ability group used the audio tapes for about 30 minutes, the average ability group used the tapes for 19 minutes and they were used for about 15 minutes by the low ability group.







In a comparison of the ability groups, it was found that the general pattern of usage for the high and average ability groups was similar. The high ability group used the books and reading references for 11 minutes, which was about twice the time of usage by the average ability group who used them for six minutes. The usage was also similar for overhead transparencies as they were used almost 12 minutes by the high ability group and for six minutes by the average ability group.

It was discovered in a comparison of the high ability group and the low ability group that certain media were utilized almost twice the length of time by the high ability group in relation to the time they were utilized by the low ability group. The high ability group used the audio tapes an average of about 30 minutes and the low ability group used them for an average of about 15 minutes.

FIGURE 1

AVERAGE IN TIME OF MINUTES SPENT
BY EACH OF THREE ABILITY GROUPS USING
SIX TYPES OF INSTRUCTIONAL MEDIA



-  Audio tapes
-  Books and reading references
-  Filmstrips and/or slides
-  Flashcards
-  Models
-  Overhead transparencies

The books and reading references were used for almost 11 minutes by the high ability group and for five and one-half minutes by the low ability group. The high ability group used the flashcards seven minutes and they were utilized for four minutes by the low ability group. The overhead transparencies were utilized by the high ability group for an average of 12 minutes and the low ability group used that medium for almost seven minutes.

The average ability group utilized all of the instructional media to a greater extent than the low ability group with the exception of filmstrips and/or slides and overhead transparencies. The filmstrips were used for six and one-half minutes by the average ability group and for seven minutes by the low ability group. The overhead transparencies were utilized for six minutes by the average ability group and for almost seven minutes by the low ability group.

The general results of the use of the instructional media as they were used and recorded in minutes by the subjects in the three ability groups were: that all three ability groups used the instructional media in a general pattern of decreasing time usage from the high ability group to the low ability group, that the models were used the most and the audio tapes were used for the second largest amount of time by all three ability groups,

and that the high ability group utilized all of the instructional media for a greater quantity of time than the other two ability groups.

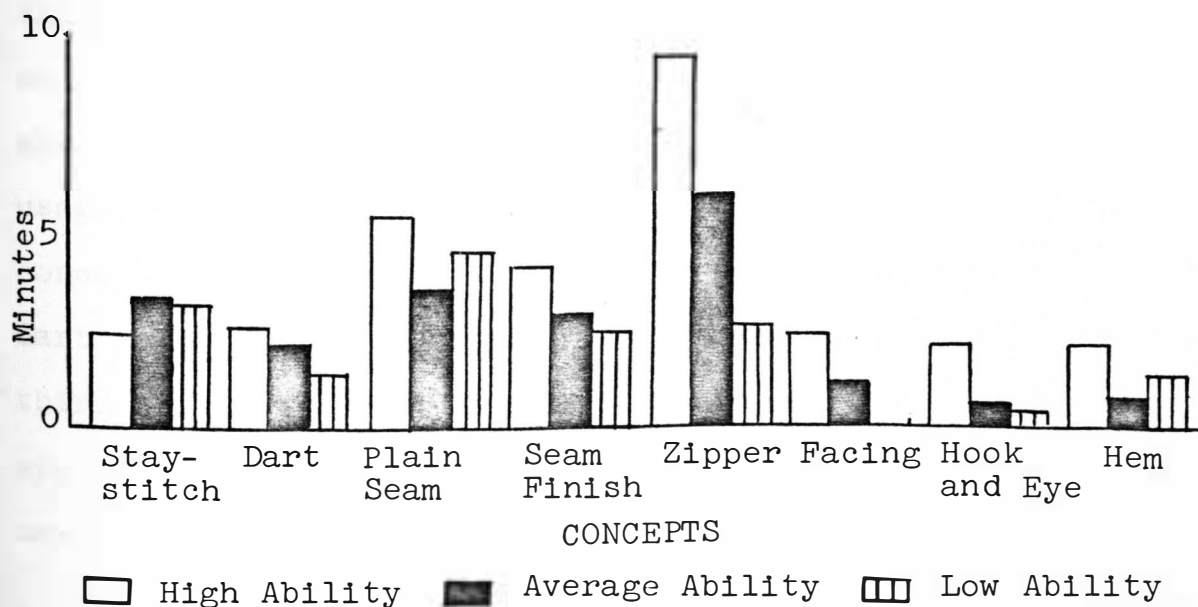
USE OF MEDIA FOR CONCEPT LEARNING

The utilization of the six types of instructional media as demonstrated by the three ability groups in learning the eight selected clothing concepts are shown in Figures 2, 3, 4, 5, 6, and 7. In discussion of these figures, concepts are presented in their declining order of time usage.

Data relating to the use of audio tapes are shown in Figure 2. The high ability group spent an average of

FIGURE 2

AVERAGE TIME OF USE OF AUDIO TAPES BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS

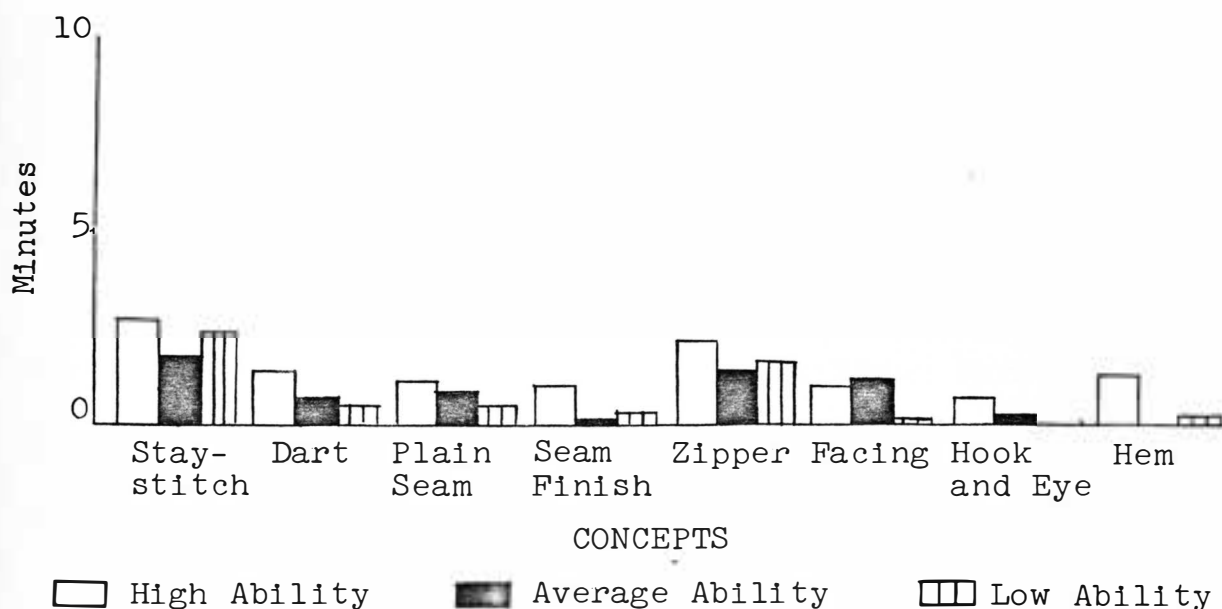


almost 10 minutes on the zipper concept which was twice as much time as was spent on the concept of plain seam which averaged five and one-half minutes and the concept of seam finish on which they spent four minutes. The remaining concepts of dart, stay-stitch, facing, hook and eye, and hem were similar in time utilization with the concepts of stay-stitch and facing identical in the time of about two and one-third minutes and hook and eye and hem also equal in time with about two minutes of usage. The average ability group used the audio tapes for the zipper concept for an average of almost six minutes with plain seam and stay-stitch for three and one-half minutes and three minutes, respectively. The remaining concepts of dart and facing were both less than two minutes and the use of the media for the hook and eye and hem concepts was less than one minute. The data in Figure 2 also indicated that the low ability group used the medium of audio tapes for the concept of plain seam for about four and one-half minutes which was the greatest amount of time usage for any concept by the low ability group. The concepts of stay-stitch, zipper, seam finish, hem, and dart followed in that order. There was only about one-third of a minute devoted to hook and eye and no time was applied to the study of the concept of facing, through the use of the audio tapes by the low ability group.

Books and reading references were used by the high ability group as shown in Figure 3, for the concept of stay-stitch for about two and one-half minutes and the zipper concept followed closely with two minutes. The average time for dart and hem was about one and one-third

FIGURE 3

AVERAGE TIME OF USE OF BOOKS AND READING REFERENCES BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS



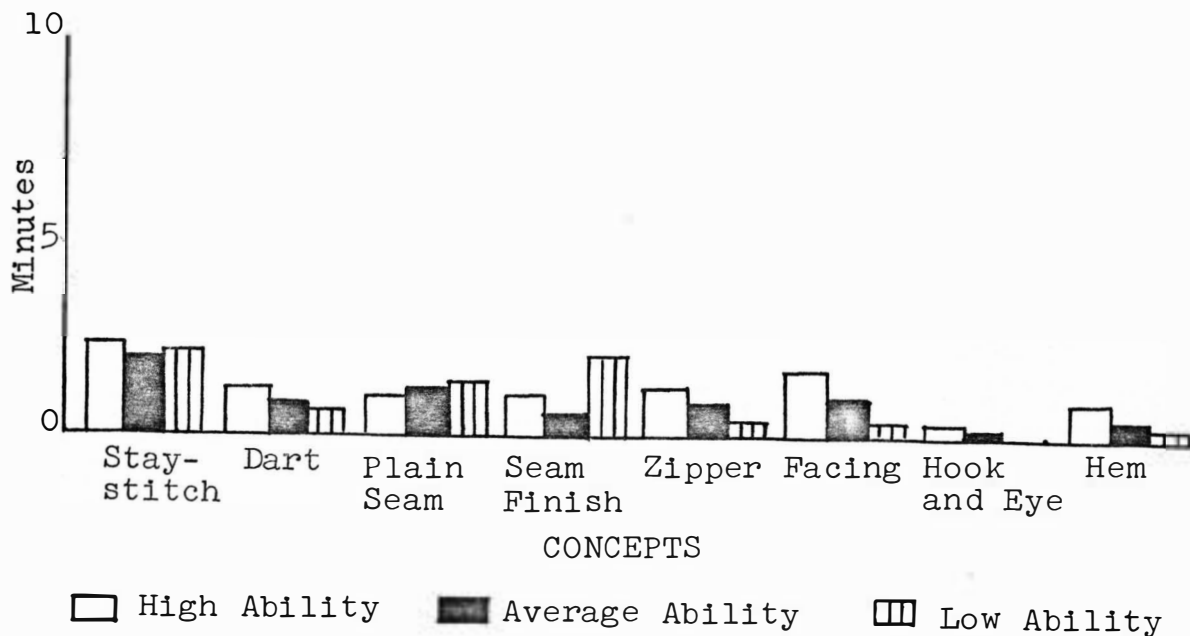
minutes, and plain seam and facing were both studied for one minute. The concepts of seam finish and hook and eye had the least amount of time spent on them. The average ability group spent the most time on the concept of stay-stitch with two and one-half minutes and the zipper

concept followed with approximately one and one-third minutes. The concepts of facing, plain seam, and dart followed in order, and the time spent on hook and eye and seam finish was less than one-fourth minute. No time was applied to the hem concept. The low ability group, as shown in Figure 3, spent the greatest amount of time on the concepts of stay-stitch and zipper with about two minutes. The amount of time for the concepts dart and plain seam was equal at one-half minute. The time for seam finish was one-fourth of a minute and the time for the concepts of facing and hem was identical at less than one-fourth minute. The information in Figure 3 showed that no time usage was applied to the concept of hook and eye by the low ability group.

Data in the use of filmstrips and/or slides are shown in Figure 4. The high ability group utilized this particular medium the most on the stay-stitch concept, using it an average of two and one-third minutes. The remaining concepts followed in the order of facing, zipper, dart, plain seam, seam finish, and hem, with the least amount of time spent on the concept of hook and eye. The average ability group's declining order of usage was: stay-stitch, about two minutes, plain seam, one minute, and with facing, dart, zipper, seam finish, hem, and hook and eye all under one minute. The information in Figure 4 reveals

FIGURE 4

AVERAGE TIME OF USE OF FILMSTRIPS AND/OR SLIDES BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS

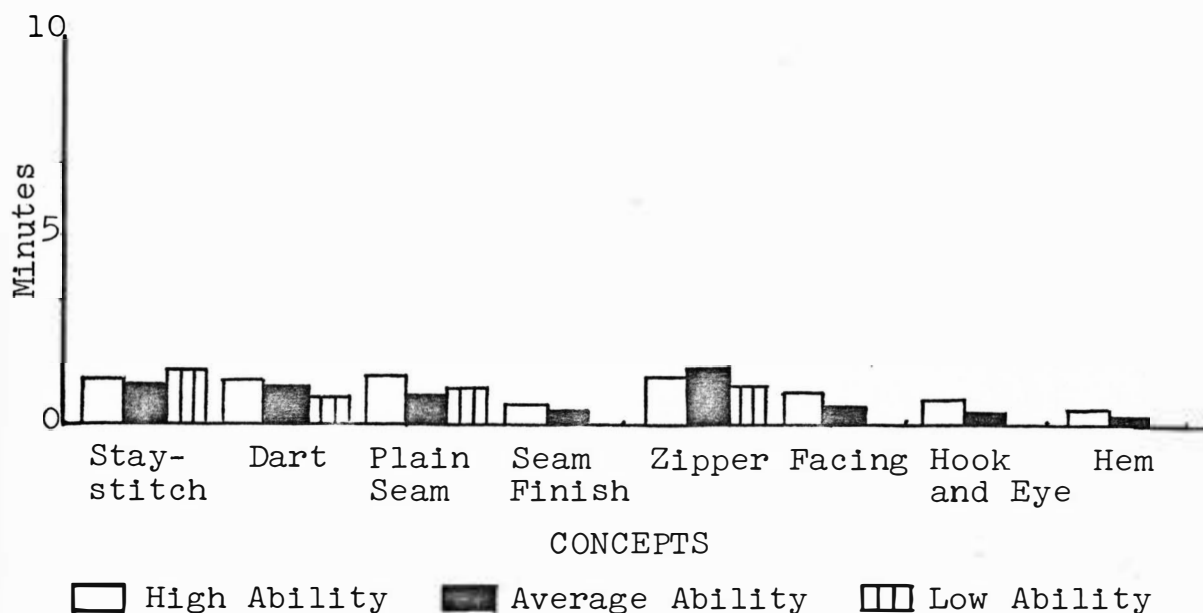


that the low ability group spent the most time utilizing the filmstrips and/or slides for the concept of stay-stitch, with two and one-third minutes. The concepts of seam finish, plain seam, and dart followed. The concept of zipper had about one-half minute, while hem and facing had about one-fourth minute of usage. There was no time devoted to the concept of hook and eye utilizing the filmstrips and/or slides by the low ability group.

The data for the medium of flashcards as shown in Figure 5 indicate that the high ability group used this

FIGURE 5

AVERAGE TIME OF USE OF FLASHCARDS BY THREE ABILITY GROUPS
FOR LEARNING EIGHT CLOTHING CONCEPTS



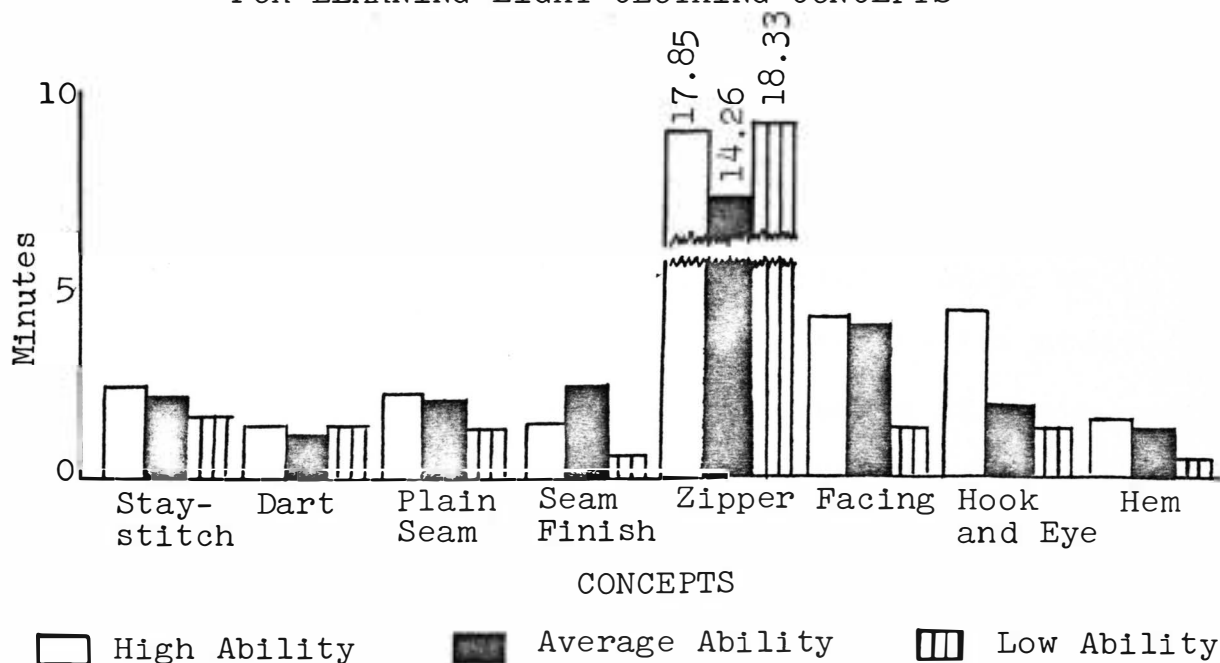
medium for learning the concept of plain seam an average of one and one-third minutes. This was the highest amount of use of the flashcards. The concept of zipper had about one minute applied to its study, and stay-stitch, dart, facing, hook and eye and seam finish followed in that order. The flashcards were used about one-third of a minute for the concept of hem. The average ability group spent the most time on the concept of zipper, with an average of about one minute applied to its study utilizing the flashcards. The concepts of stay-stitch, dart, plain

seam, and facing followed. The least amount of time was spent on the concepts of seam finish, hook and eye, and hem, all at less than one-half minute. As shown in Figure 5, the greatest amount of time was spent by the low ability group on the concept of stay-stitch with almost one and one-half minutes. The time of one minute was identical for the concepts of plain seam and zipper with dart following. The low ability group did not use the flash-cards for learning the concepts of seam finish, hook and eye, and hem.

The information in Figure 6 discloses that the models

FIGURE 6

AVERAGE TIME OF USE OF MODELS BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS

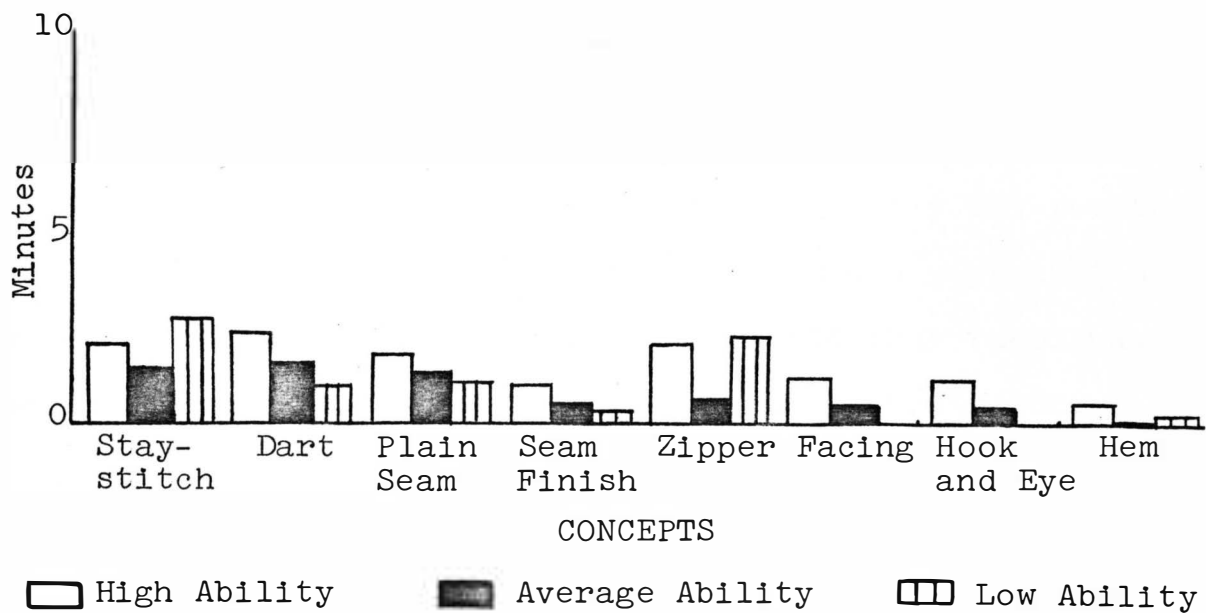


were highly utilized by all three ability groups in the study of the concept of zipper. The high ability group spent four times the number of minutes on the zipper concept, with an average of about 18 minutes, than they spent on the next aligned concepts of hook and eye with slightly over four minutes, and facing with four minutes. Following in succession were stay-stitch, plain seam, and hem, with dart and seam finish identical with one and one-third minutes. The average ability group utilized the models four times as long on the zipper concept as on the next aligned concept of facing. The data in Figure 6 reveal that 14 minutes were applied to the concept of zipper, and four minutes applied to the concept of facing. Following in succession were: seam finish, plain seam and stay-stitch identical with two minutes, hook and eye, hem, and then dart. The low ability group utilized the models for the concept of zipper for an average of slightly over 18 minutes, which was eleven times more than the time applied to the study of the next sequential concept of stay-stitch with nearly two minutes applied to its study. The time applied to the study of the concepts of plain seam, facing, and hook and eye, were identical with one and one-third minutes. The concept of dart was studied about one minute and one-half minute was applied to the study of the concept of seam finish, and less than one-half minute to the concept of hem.

The use of the overhead transparencies for learning the concepts is shown in Figure 7. The high ability group

FIGURE 7

AVERAGE TIME OF USE OF OVERHEAD TRANSPARENCIES BY THREE ABILITY GROUPS FOR LEARNING EIGHT CLOTHING CONCEPTS



utilized the transparencies for learning the concepts in the following order of time usage: dart, two and one-third minutes; stay-stitch and zipper identical in time with two minutes; plain seam, less than two minutes; facing and hook and eye, one minute; and seam finish and then hem followed in succession. The data in Figure 7 disclose that the average ability group spent the greatest number

of minutes on the concept of dart, with one and one-half minutes. The concepts of plain seam, stay-stitch, and zipper followed in that order. Identical time was devoted to the study of seam finish and facing, about one-half minute, following were hook and eye with one-third minute, and hem with a negligible amount of time. The low ability group utilized the medium of overhead transparency for the concept of stay-stitch for two and one-half minutes. The concept of zipper followed closely with two minutes, and then plain seam and dart. Seam finish had only one-fourth of a minute devoted to its study, and hem had very little time. The information in Figure 7 reveals that there was no time devoted to the use of the overhead transparency for the concept of facing and hook and eye by the low ability group.

The high ability group utilized all of the six types of instructional media for learning all of the eight selected clothing concepts. It is the belief of the researcher that the high ability group's consistent use of the instructional media for the learning of the concepts demonstrates their positive initiative and desire to learn by all of the available methods of instruction.

The average ability group utilized all of the media except the books and reading references for the concept of hem. The time spent using the media for learning the

concepts was below the time of the high ability group except in the use of the filmstrips and/or slides for the concept of plain seam, in the use of the flashcards for the study of the concept of zipper, and in the utilization of the models for the study of the concept of seam finish. This might be an indication that the average ability group had an awareness of the concepts in which they needed study and used the necessary media for learning these concepts although more time was required for them than for the high ability group. The average ability group spent less time than the low ability group utilizing some of the media for learning certain concepts. This might have been due to a faster comprehension of the skills required to master the concepts and to some previous knowledge of the concepts on the part of the average ability group as compared to the low ability group.

In the use of the instructional media for learning the concepts, the low ability group did not use: the audio tape for learning the concept of facing; the books and reading references for learning the concept of hook and eye; the filmstrips and/or slides for learning hook and eye; the flashcards for learning the concepts of seam finish, facing, hook and eye, and hem, and the overhead transparencies for learning the concepts of facing and hook and eye. They did, however, use the media of models for learning all of the concepts. The low ability group did

not demonstrate as much consistency in the utilization of all of the available means of learning, and they did not display as much initiative in the use of all of the media as the other two groups. Perhaps this was due to a slower rate of comprehension which might have affected their confidence and thus their perseverance in the use of the media. The low ability group especially favored the models for learning the concepts which may have been due to the tactile and visual characteristics of that particular media.

In the use of the instructional media it was observed by the writer that at the beginning of the study many of the students used all six of the instructional media for learning the beginning concepts, however, they became more selective as to their use of the media for learning the remaining concepts.

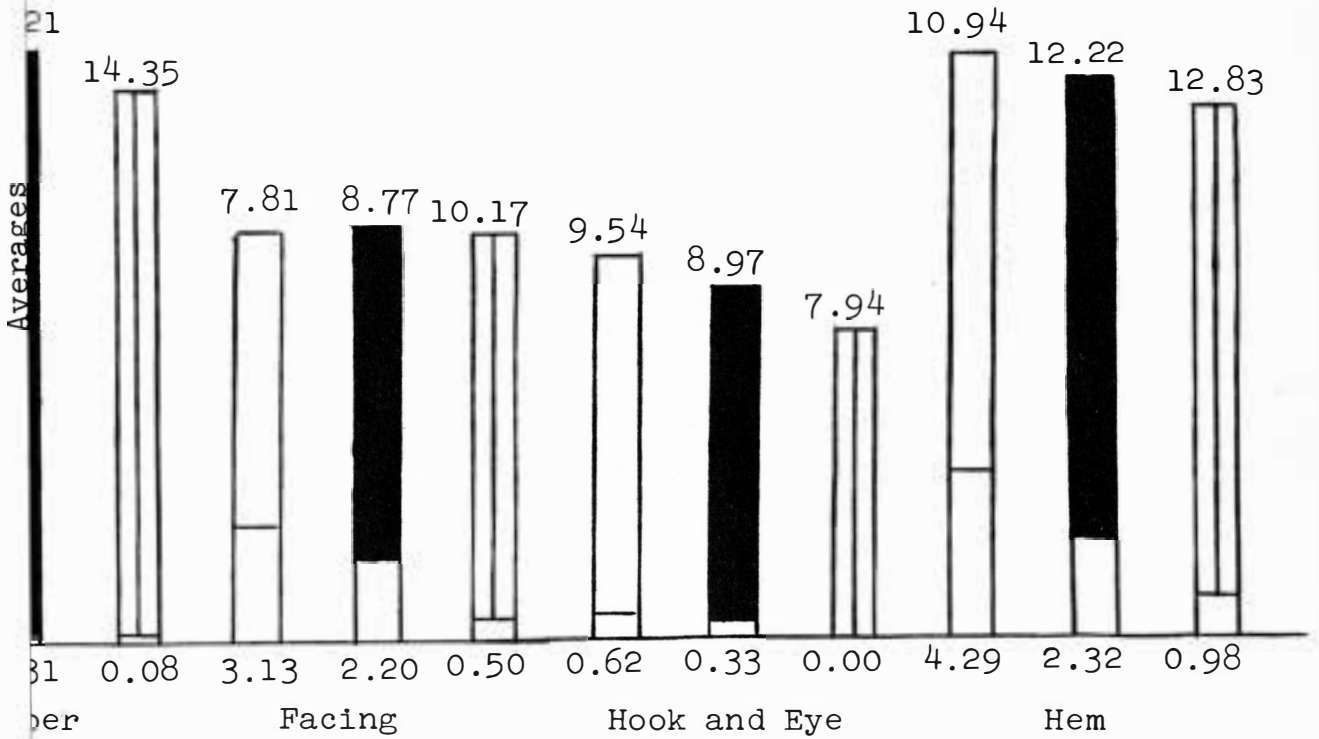
All three ability groups spent the greatest amount of time on the concept of zipper. For learning the zipper concept, all of the ability groups utilized the instructional media of the model the most, and secondly the audio tape. In the use of the model, the low ability group's usage was the highest with the high ability group next, and the average ability group using the model the least. The audio tape was used to learn the concept of zipper with the high ability group using it the most, the average group next, and the low ability group using the audio tape the least.

IMPROVEMENT FROM PRETEST TO POST-TEST

The means of the improvement scores as rated by the four evaluators showing change from pretest to post-test are shown in Figure 8.

The greatest amount of improvement was made in the concepts of zipper and hem. The concept of zipper demonstrated the greatest improvement even though the pretest knowledge levels were the lowest for that particular concept. Accounting for this utmost change might be the factor that all three ability groups had spent a great majority of their time studying the concept of zipper by utilizing the medium of the model (see Figure 6). The average ability group progressed slightly more than the high ability group and the progress score of the low ability group was one point lower. However, it should also be noted that the low ability group had the lowest pretest score and had devoted the most time (see Figure 6) of the three ability groups to the study of the zipper concept. The concept of hem showed the next greatest amount of change with the low ability group exhibiting the lowest pretest scores and also the greatest amount of progress. The low ability group, although its members studied the zipper concept by using the models for the greatest length of time, did not, however achieve as high a score on improvement as the other two ability groups.

R
POST-TEST
OUPS



■ Average Ability Group

□ Low Ability Group

Perhaps this was due to the difficulty of the concept and the steps required to complete the zipper concept. The concept of hem did not appear to be as difficult for the low ability group as these students achieved the greatest improvement in that concept as compared to the high and average ability groups.

The concept of hook and eye in Figure 8 shows low pretest scores for all three ability groups and the amount of change is not as great as the change for the other two concepts of zipper and hem. The failure to achieve the levels of these other two previously mentioned concepts might have been due to the necessity of the use of the finer motor skills required for the application of the hook and eye which perhaps were more intricate than those needed for the zipper and the hem.

All of the ability groups achieved high progress scores in the concepts of stay-stitch, dart, and plain seam. The scores for the three ability groups in the concept of stay-stitch were all above five, with the high ability groups showing the greatest progress with a score of nine. In the concept of dart, the highest score was about six for the low ability group and the lowest improvement score which was just over five was achieved by the high ability group. The low ability group also achieved the greatest improvement in the plain seam concept with a score of almost

six as compared to four for the high ability group and about three for the average ability group. The pretest scores of the ability groups showed that they had some previous experience in these concepts as they were all above four and one-half. In the stay-stitch concept the average group progressed the most although their pretest level of six was lower than the high ability group and higher than the low ability group. In the dart concept the low ability group progressed the most and their pretest level of seven and one-third was the lowest of the three ability groups. In the concept of plain seam, the low ability group progressed the most and had the lowest pretest score of seven but in comparison the average ability group made the least progress although they had the highest pretest level of ten and one-half.

The three ability groups had some previous experience in the concepts of seam finish and facing, but they did not perform at as high a level on the evaluation standards as they did in the other concepts. The average and low ability groups progressed in a like manner in the concept of seam finish. The high ability group progressed the least with a score of six and one-half although they had the highest pretest level of almost four. The pretest score for the average group was almost one and the low ability group's score was quite low being less than one-fourth. The improvement on the concept of facing was the

greatest for the low ability group although their pretest level was the lowest. The other two ability groups had greater pretest knowledge but did not progress to as high a level with scores of nine for the average ability group and almost eight for the high ability group. The fact that the ability groups did not perform to as high a level on the evaluation standards as they did in the other concepts, was perhaps due to the motor skills necessary in the manipulation of sewing equipment needed for seam finishes and working with curved areas of fabric in the concept of facing. The higher rate of progress made by the average and low ability groups, especially the low ability group in the concept of facing, was perhaps due to their lack of previous experience as demonstrated by their low pretest scores in the two concepts of seam finish and facing as shown in Figure 8.

SIGNIFICANCE OF IMPROVEMENT SCORES

When one group is used in a study and a later performance is compared with some earlier trial, the group is said to furnish its own control and thus becomes both the experimental and control group. One method of comparing means of a later performance to an earlier trial is first to find the difference in the scores for each subject. The significance of the mean difference is then tested

against the null hypothesis that population improvement = 0.

The improvement scores of the three ability groups were obtained by finding the difference between the pretest and the post-test, which resulted in the improvement scores showing the change from the pretest to the post-test.

Using the t test to measure significance of the improvement scores, the following formulas were used:

(15:130)

$$SD = \sqrt{\frac{\sum X^2}{(N-1)}} \qquad t = \frac{(M_D - 0)}{SEM_D}$$

$$SEM_D = \frac{s}{\sqrt{N}} \qquad df = (N-1)$$

The significance of improvement from pretest to post-test is shown in Table I. All of the concepts showed improvement at the .01 level of significance by all three of the ability groups with the exception of the low ability group in the concept of dart, which was significant, however, at the .05 level. The results were that all of the concepts showed significant improvement by all three ability groups, thus, the null hypothesis was rejected.

TABLE I

SIGNIFICANCE OF THE MEAN IMPROVEMENT SCORES FROM PRETEST
TO POST-TEST FOR THE THREE ABILITY GROUPS

Ability Group		Stay-stitch 1	Dart 2	Plain Seam 3	Seam Finish 4	Zipper 5	Facing 6	Hook and Eye 7	Hem 8
High 13	High Score	14.75	16.75	14.50	12.50	17.00	11.50	11.50	17.50
	Low Score	0.50	-0.25	0.0	0.0	11.75	5.00	5.00	3.25
	Mean	5.79	5.17	4.15	6.56	15.64	7.81	9.54	10.94
	Standard Dev.	5.39	5.07	4.58	4.76	1.44	2.27	2.02	4.74
	* Maximum "t"	3.72	3.54	3.14	4.77	36.16	11.91	16.37	7.99
Average 27	High Score	15.00	16.75	14.75	12.00	17.00	12.00	5.00	16.75
	Low Score	0.50	-0.50	-1.75	1.25	10.25	0.25	11.25	4.00
	Mean	8.47	5.97	3.24	9.58	15.21	8.77	8.97	12.22
	Standard Dev.	5.83	5.45	4.57	2.41	1.69	3.06	1.66	3.53
	** Maximum "t"	7.41	5.59	3.61	20.28	45.80	14.62	27.63	17.66
Low 12	High Score	14.75	16.50	13.25	12.00	17.00	11.50	11.00	16.25
	Low Score	1.75	-8.00	0.25	6.50	12.25	8.50	5.00	7.25
	Mean	9.04	6.17	5.83	9.56	14.35	10.17	7.94	12.83
	Standard Dev.	4.76	7.27	5.14	1.79	1.60	1.02	1.69	2.63
	*** Maximum "t"	6.30	2.81 ^a	3.76	17.73	29.71	32.98	15.58	16.22

* t at .01 level = 3.06.

** t at .01 level = 2.78.

*** t at .01 level = 3.11.

^a at .05 level = 2.20

MEDIA AS RANKED FIRST IN USAGE AND HELPFULNESS

An analysis of the information in Table II discloses how the media were ranked by number and percent when considering only rank number one for usage and for helpfulness of the six types of instructional media. The audio tapes and the models were ranked first most frequently in usage throughout the study. At the end of the study, students also ranked first these media as being the most helpful.

A comparison was made between the use of the media as ranked first by student usage and the student's feelings about the helpfulness of the media. Only the first rank of the six types of instructional media was considered in order to secure data which revealed the media that were the most helpful to the student.

The high ability group gave ranks of number one most frequently to the audio tapes and to the models. Although the audio tapes were ranked first by six students according to student usage, they were only ranked once by the students as being the most helpful. The models were ranked first by student usage a total of seven times (53.8%) and they were ranked first by student attitude as to degree of helpfulness nearly twice as many times, with a first rank given to the models by 12 students (92%). Thus, the high ability group favored the media of the

TABLE II

NUMBER AND PERCENT OF SIX MEDIA RANKED FIRST BY USE AND RANKED FIRST
IN HELPFULNESS BY STUDENTS

Ability Groups	Use and Helpfulness	Audio Tape		Books and Reading References		Filmstrips and/or Slides		Flashcards		Models		Overhead Transparency	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
High	Use ^a	6	46.2	0	0	0	0	0	0	7	53.8	0	0
	Helpfulness ^b	1	8.0	0	0	0	0	0	0	12	92.0	0	0
Average	Use	6	22.2	0	0	0	0	1	3.7	19	70.4	0	0
	Helpfulness	2	7.4	1	3.7	0	0	0	0	25	92.6	0	0
Low	Use	3	25.0	0	0	0	0	0	0	8	66.7	1	8.3
	Helpfulness	1	8.3	1	8.3	1	8.3	0	0	9	75.1	0	0
Total	Use	15	28.8	1	1.9	0	0	1	1.9	34	65.5	1	1.9
	Helpfulness	4	7.7	1	1.9	1	1.9	0	0	46	88.5	0	0

^aUse indicates time the medium was used.

^bHelpfulness indicates Rank Number I as ranked by students.

audio tapes and the models with the latter given the number one rank the greatest number of times.

The average ability group also preferred the audio tapes and the models although they gave the media of the books and reading references a rank of number one in helpfulness once, and the flashcards were ranked as number one a single time by student usage. The average ability group ranked the audio tapes three times more by student usage (22.2%), than they ranked them for helpfulness (7.4%). The models were given a rank of number one more times in helpfulness (25), than they were given by student usage (19), although they were ranked number one by the average ability group more times than any other medium.

The low ability group also considered the audio tapes and the models as helpful. They gave a rank of number one, in one instance, to the media of books and reading references and to filmstrips and/or slides in degree of helpfulness. The overhead transparencies were ranked number one by student usage a single time. The audio tapes were ranked first in usage three times more (25%), than they were in helpfulness (8.3%). The ranks for models were similar for student usage and helpfulness as they were ranked first eight times in student usage and nine times in student attitude as to helpfulness.

Some general conclusions that were made by the writer about the media as they were ranked number one by student usage throughout the study, and student attitude toward helpfulness upon completion of the study were:

1. that the high ability group was the most selective and definite about the media they considered to be the most helpful (models first and then the audio tapes) both by use and attitude;
2. that the average and low ability groups considered other media worthy of a rank of number one, although not as many times as for the models which were first, and the audio tapes second;
3. that although the audio tapes were ranked as number one frequently by all three ability groups, according to student usage (15) they were ranked less times in helpfulness (4) by student attitude; and
4. that the medium which ranked as number one the greatest number of times by student usage (34) throughout the study, and as to helpfulness (46) upon completion of the study, was the models.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

The primary objective of this study was to provide independent study instructional media that would help each student in a heterogeneous group to achieve selected concepts in beginning clothing construction. The study was seven weeks in duration and included fifty-two subjects in four sections of eighth grade homemaking. Six types of instructional media were used to teach the students the eight clothing concepts in the independent study laboratory. The six types of instructional media were: audio tapes, books and reading references, filmstrips and/or slides, flashcards, models, and overhead transparencies. The eight selected clothing construction concepts were: stay-stitch, dart, plain seam, zipper, seam finish, facing, hook and eye, and hem. The subjects were administered a pretest consisting of a half-scale muslin skirt and the post-test was a cotton skirt constructed by the student in the independent study laboratory. Four evaluators rated the skirts. The

fifty-two subjects were divided into three ability groups of high, average, and low on the basis of their scores achieved on the Iowa Test of Basic Skills. The pretest and post-test skirts were then evaluated using the mean scores of each ability group.

The data were obtained by: students keeping a record of the time spent utilizing each media for each concept, finding the change in improvement from the pretest to the post-test using progress as the basis for student evaluation, testing the significance of improvement by using the t test, and students ranking the media as to their helpfulness.

Results of the study indicated that the models were utilized the most of all of the six types of instructional media and that the zipper concept, was studied for the greatest amount of time and also showed the greatest amount of improvement. The low ability group made the least progress in the concepts which involved the more intricate motor skills, however, all of the ability groups made the greatest improvement in the concepts in which they had the least pretest knowledge. The t test proved that the change of all of the ability groups in all of the concepts was significant. The students ranked the instructional media as to their helpfulness. The first rank of the instructional media as used throughout the study, and

the first rank of the media as considered by student attitude toward helpfulness upon completion of the study, were compared. In all of the ability groups the models were considered first and second were the audio tapes in use and in helpfulness. In a comparison between the audio tapes and the models, the students declared the models to be the most helpful. This was also indicated by student use of the media.

CONCLUSIONS

From the results of the data obtained in the study, and within the limits of this study, the following conclusions have been made:

1. In the use of the instructional media, the models first and then the audio tapes, were used the most by all three ability groups, and thus were considered to be the superior type of instructional media.
2. In the use of the instructional media for the concept learning, the models were utilized the most and secondly the audio tapes and the concept which all three ability groups spent the greatest amount of time on was that of the zipper.
3. In the improvement from pretest scores to post-test scores, all three ability groups improved the most in the areas where they had the least pretest knowledge, mainly in the concept of zipper.
4. In the use of the instructional media as used by the three ability groups to learn the concepts, it was found that they improved the most in the concept of zipper, which they studied the greatest length of time utilizing the models. Thus, it is believed by the writer that the

instructional media of the models was effective in implementing success in the learning of the concept of zipper.

5. In the improvement from the pretest to the post-test the t ratio was used to test the significance of the improvement in relation to the general population. All of the concepts improved at the .01 level of significance except that of the concept dart, by the low ability group. That concept was significant, however, at the .05 level of significance. Thus, the improvement from the pretest to the post-test as shown in the means of the scores of the three ability groups, was considered significant.
6. In the comparison of the instructional media as ranked first in usage throughout the study, and ranked first by student's attitude toward its helpfulness, the models were considered the most helpful by student attitude, even though the audio tapes had been used quite frequently throughout the study. Thus the models, which have tactile and visual properties, were considered the most helpful by the students for learning the concepts.
7. In the implementation of the study, it was observed by the writer that certain students still needed and thrived upon personal interaction between the teacher and pupil and among pupils. Thus, the importance of personal interaction, even in the independent study laboratory, is stressed by the writer.

RECOMMENDATIONS

In light of the results of the study and the observations made throughout the study, the following recommendations are made:

1. Develop and refine the materials and attempt a similar study with more subjects, utilizing several different types of schools, and different teachers and then compare the student success.

2. Attempt a similar study considering the necessary motor skills involved in the clothing concepts in relation to student success in these concepts.
3. Attempt a similar study using the single concept loop films instead of filmstrips. The quality and quantity of the filmstrips available are considered questionable by the writer.
4. Implement a similar study using slides produced by the researcher instead of commercial filmstrips.
5. Carry out a similar study involving a control group taught by teacher lecture and demonstration and evaluate student success as compared to students taught by the independent study laboratory.
6. Implement a similar study, substituting another type of fastener, other than the hook and eye, which involves less intricate muscle skill for application.
7. Attempt a similar study, considering the amount of personal interaction as desired by the students between teacher and pupil and among pupils in an independent study laboratory.
8. Carry out a similar study in another subject area.
9. Implement a similar study with the resources available for additional learning experiences for the high ability student and as a supplement to the instruction for the average and low ability student.
10. Attempt a similar study using the instructional materials in a resource center for students who are sporadic in attendance or who are absent for a prolonged period of time.

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APPENDIX

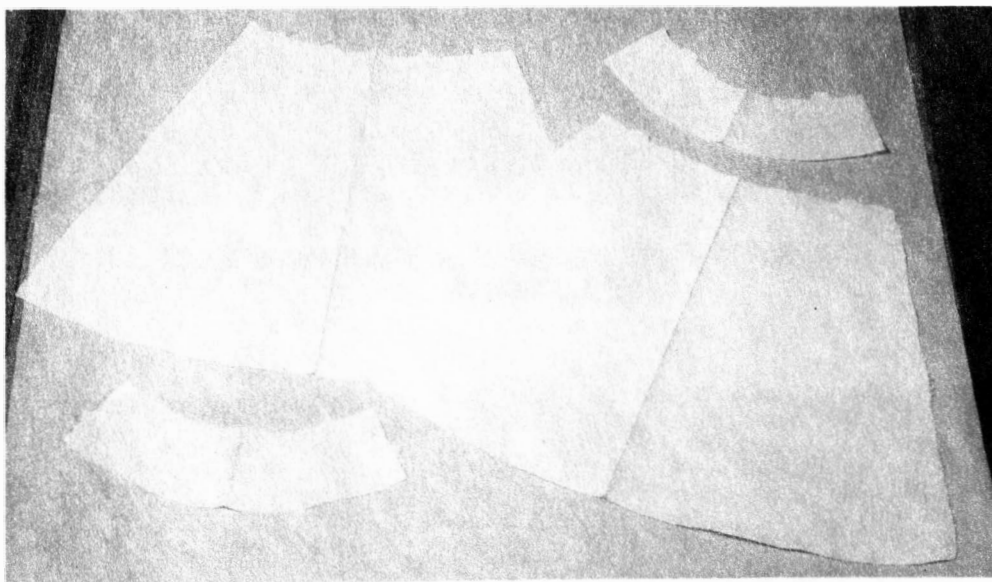


ILLUSTRATION OF PRETEST: HALF-SCALE MUSLIN SKIRT

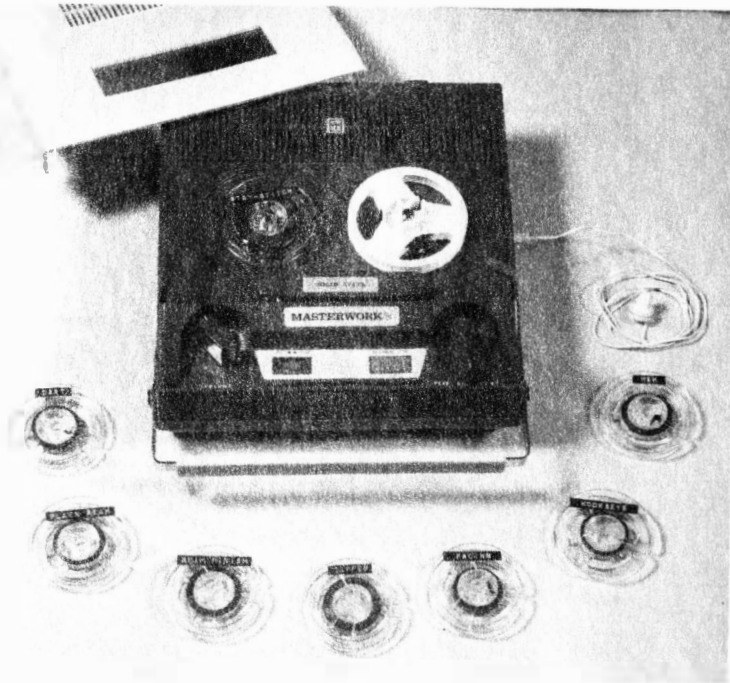


ILLUSTRATION OF INSTRUCTIONAL MEDIA:
AUDIO TAPES

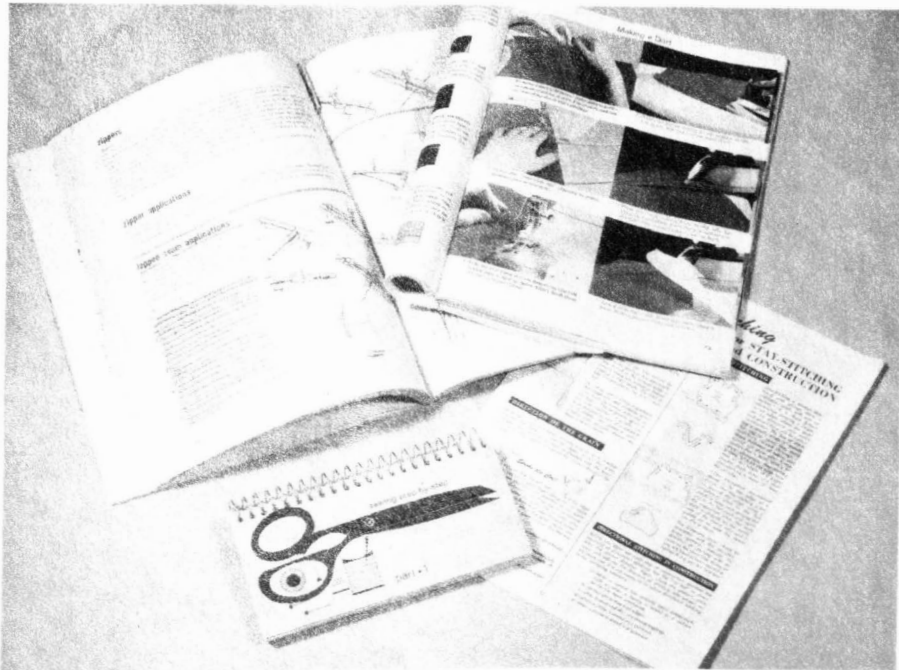


ILLUSTRATION OF INSTRUCTIONAL MEDIA:
BOOKS AND READING REFERENCES

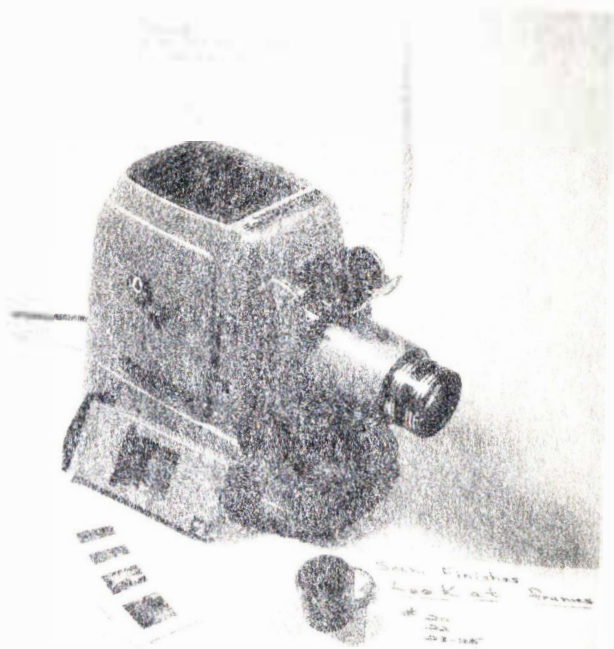


ILLUSTRATION OF INSTRUCTIONAL MEDIA:
FILM TRIPS AND/OR SLIDES



ILLUSTRATION OF INSTRUCTIONAL MEDIA:
FLASHCARDS

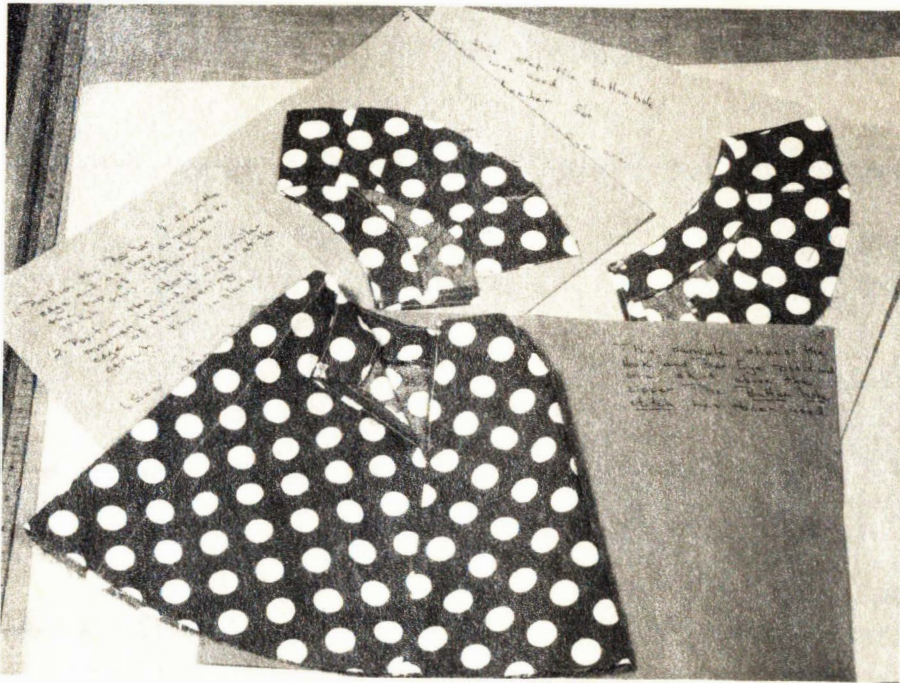


ILLUSTRATION OF INSTRUCTIONAL MEDIA:
MODELS

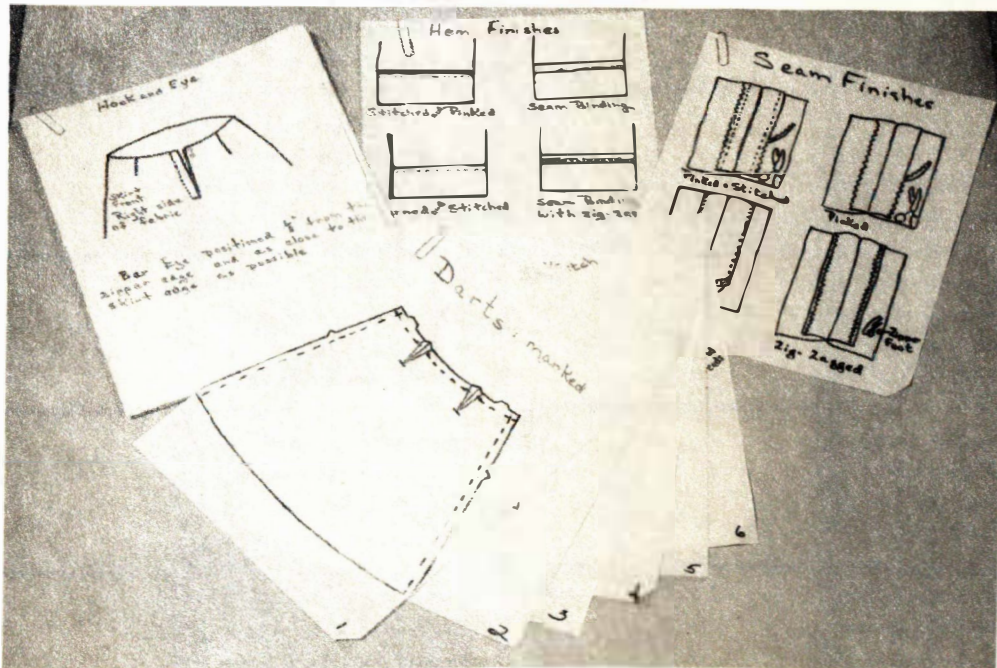


ILLUSTRATION OF INSTRUCTIONAL MEDIA:
OVERHEAD TRANSPARENCIES

INSTRUCTIONAL MEDIA SOURCES

Some of the instructional media were prepared by the teacher and some were commercial materials. The media of audio-tapes, flashcards, models, and overhead transparencies were teacher prepared. The media of books and reading references and filmstrips and/or slides consisted of mainly commercial materials. The commercial materials used in this study were as follows:

<u>Concept</u>	<u>Books and Reading References</u>	<u>Filmstrips and/or Slides</u>
Stay-stitch	<u>Simplicity Sewing Book</u> , New York: Simplicity Pattern Co., Inc., 1965, p. 35. <u>Simplicity Sewing Book</u> , 1962, p. 26. <u>Sewing Secrets</u> , New York: Coats and Clarks Inc., 1956, p. 12.	<u>How to Make a Skirt</u> , Simplicity Pattern Co., Inc., Frames 3 and 4.
Dart	<u>McCall's Step-By-Step Sewing Book</u> , New York: McCall Corporation, 1969, p. 73. <u>McCall's Tips for Easy Sewing</u> , 1968, p. 27. <u>Simplicity Sewing Book</u> , 1965, p. 84.	<u>How to Make a Blouse</u> , Simplicity Pattern Co., Inc. one selected frame.
Plain Seam	<u>McCall's Step-By-Step Sewing Book</u> , 1969, p. 70. <u>McCall's Tips for Easy Sewing</u> , 1968, p. 26. <u>Simplicity Sewing Book</u> , 1965, p. 86.	<u>Machine Stitching and Seams</u> , New York: McGraw-Hill Book Co., Frames 4, and 14-15.

- Simplicity Sewing Book, 1962, p. 38.
- Seam Finish McCall's Step-By-Step Sewing Book, 1969, p. 55, 56, and 90. Machine Stitching and Sewing, McGraw-Hill Book Co., Frames 20, 22, and 23-25.
- McCall's Tips for Easy Sewing, 1968, p. 26.
- Simplicity Sewing Book, 1965, p. 110.
- Simplicity Sewing Book, 1962, p. 40.
- Zipper McCall's Step-By-Step Sewing Book, 1969, p. 127. Penney's Clothing Construction Methods No. 1, B-Making a Skirt, J. C. Penney Co., Inc., Frames 45, 46, 48, 49, and 50.
- McCall's Tips for Easy Sewing, 1968, pp. 108-109.
- Simplicity Sewing Book, 1965, p. 110.
- Simplicity Sewing Book, 1962, p. 108.
- Facing McCall's Tips for Easy Sewing, 1968, p. 74. Teacher-Prepared
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- Hem McCall's Step-By-Step Sewing Book, 1969, p. 84. McCall's: Making a Hem, two selected frames.
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TAPE: STAY-STITCHING

Begin Concept: Stay-stitching

Stay-stitching should be done immediately after removing the pattern from the cut and marked fabric.

What is stay-stitching?

Stay-stitching is defined as a line of regulation length machine stitching (12 stitches per inch) done on bias or curved edges that are to be joined to another piece.

The purpose of stay-stitching is to hold the grain so the fabric will not stretch during construction.

For our purposes, stay-stitching is done on a single thickness of material at 1/2 inch from the raw edge within the seam allowance.

Use directional grain line stitching. The skirt front and skirt back directions for stay-stitching are as follows:

1. Side seams are stitched beginning at the notch and stitching upward toward the waistline raw edge.
2. Waistline is stay-stitched from the left side seam to the center front or center back and from the right side seam to the center front or center back.
3. Need not backstitch.

Remember: Stitch length: 12 stitches per inch.
Seam depth: 1/2 inch from the cut edge.
Stitching: Use directional grainline stitching on single thickness of material.

End of Concept: Stay-stitching.

PRETEST INSTRUCTIONS

8th Home Economics
Clothing Construction

Name _____
Section _____

INTRODUCTION

This is a PRETEST to determine your ability in the eight concepts defined below.

OUR OBJECTIVE: To determine what concepts we now know and where we need to begin when learning these particular concepts.

You will not be graded on this particular test, however your progress will be evaluated upon completion of these eight concepts at the end of the clothing construction unit.

DIRECTIONS

On the one-half scale skirt pattern with facings, complete concepts 1, 2, 3, 5, 6, and 8. Concepts 4 (Zipper) and 7 (Hook and Eye) are completed on the 6 x 12 inch sample which the teacher will give you when needed. Ask her when you need this fabric sample.

COMPLETE ALL OF THE FOLLOWING CONCEPTS THAT YOU CAN. PLACE A C IN THE BLANK BEFORE THE CONCEPTS COMPLETED AND AN INC IN THE BLANK BEFORE THE CONCEPTS LEFT INCOMPLETE.

C = COMPLETE

INC = INCOMPLETE

THE EIGHT CONCEPTS DEFINED

- ____ 1. STAY-STITCHING: A regular machine stitch (12 stitches per inch) placed in the seam allowance at 1/2 inch from the raw edge to prevent stretching.
- ____ 2. DART: A stitched fold, tapered at one end, made in a garment for fitting fabric to curved areas.

- _____ 3. PLAIN SEAMS: The result of joining fabric edges or parts of garments together.
(USE THE STANDARD SEAM ALLOWANCE)
- _____ 4. SEAM FINISH: A finish applied to the seam allowance to prevent raveling.
(THERE IS MORE THAN ONE METHOD OF FINISHING A SEAM. CHOOSE THE APPROPRIATE METHOD FOR THIS FABRIC.)
- _____ 5. ZIPPER: A slide fastener device for joining two pieces of cloth, consisting of two parallel rows of parts interlocked or parted by the motion of a slide.
(ALLOW SUFFICIENT ROOM BETWEEN THE ZIPPER AND THE FABRIC TOP EDGE FOR THE HOOK AND EYE, ALSO ALLOW A SUFFICIENT OVERLAP. USE THE LAPPED APPLICATION.)
(COMPLETE THIS CONCEPT ON THE 6 x 12 INCH SAMPLE!)
- _____ 6. FACING: A fitted piece of fabric used to finish an edge.
(APPLY ANY SPECIAL TECHNIQUES WHICH WILL IMPROVE YOUR FACING AND ITS POSITION ON THE SKIRT.)
- _____ 7. HOOK AND EYE: A metal fastener used to close an opening in a garment.
(USE ANY SPECIAL STITCH YOU KNOW FOR ATTACHING THE HOOK AND EYE.)
(COMPLETE THIS CONCEPT ON THE 6 x 12 INCH SAMPLE!)
- _____ 8. HEM: A means of finishing the lower edge of a garment.
(ALLOW SUFFICIENT HEM DEPTH, FINISH THE RAW EDGE, AND USE AN APPROPRIATE HAND STITCH.)

DIRECTIONS: READ THROUGH THE CONCEPTS AND DEFINITIONS AGAIN, TO BE SURE THAT YOU HAVE COMPLETED AS MANY AS POSSIBLE.

AFTER YOU HAVE COMPLETED THE CONCEPTS TO THE BEST OF YOUR ABILITY, GIVE THIS INSTRUCTION SHEET AND YOUR SAMPLES TO THE TEACHER.

AT AN INDIVIDUAL CONFERENCE WITH YOUR TEACHER, YOU WILL DETERMINE WHAT CONCEPTS YOU COMPLETED AND DISCUSS YOUR PLANS FOR PROGRESS CONCERNING THESE CONCEPTS.

PRETEST AND POST-TEST

Garment Evaluation

Student Number _____

Judge Number _____

Initials _____

3

2

1

0

Pretest Scores

Post-test Scores

STAY-STITCHING

<p>___ 1. Waistline and sides stay-stitched</p>	<p>Waistline and one side stay-stitched or both sides and one part of waistline stay-stitched</p>	<p>Only waistline and/or side seam stay-stitched or only front or only back stay-stitched at waistline or side seams</p>	<p>Stay-stitching omitted 1. ___</p>
<p>___ 2. Stay-stitched at 12 stitches per inch</p>	<p>14-18 stitches per inch</p>	<p>8-10 stitches per inch</p>	<p>6-8 stitches per inch 2. ___</p>
<p>___ 3. Stay-stitched 1/2 inch from the raw edge within the seam allowance (allowing for alteration)</p>	<p>3/8"-1/2" from raw edge in some places</p>	<p>1/4" or 5/8" to 3/4" from raw edge in some places</p>	<p>1/8" from raw edge or 3/8"-3/4" from raw edge 3. ___</p>

	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	
<u>4.</u> Stay-stitching does not show on right side any place		Shows in 1 or 2 places	Shows in 3 or more places	Stay-stitching omitted	4. <u> </u>
<u>5.</u> Stay-stitching tension is correct		Tension slightly incorrect in some places	Tension is incorrect in most places	Tension incorrect in all places	5. <u> </u>
<u> </u> Subtotal				Subtotal <u> </u>	

DARTS

<u>6.</u> On 4 darts stitching coincides with traced line or altered correctly		1 dart is stitched too wide or narrow or long or short	2 or 3 darts stitched too wide, narrow, long or short	Does not coincide with traced lines on all 4 darts	6. <u> </u>
<u>7.</u> On all 4 darts stitching tapered correctly		2 or 3 darts tapered correctly	1 dart tapered correctly	No darts tapered correctly	7. <u> </u>
<u>8.</u> Threads at points of all darts secured		Threads at points of 2 or 3 darts secured	Threads at point of 1 dart secured	None of the dart points secured	8. <u> </u>
<u>9.</u> Dart threads trimmed on all 4 darts (about 1/8")		Trimmed on 1, 2, or 3 darts/ or trimmed at 1/8"	Trimmed on 1 dart at 1/8"	Threads not trimmed on any darts	9. <u> </u>

	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	
<u>10.</u>	4 darts stitched at 12-15 stitches per inch	2 or 3 darts stitched at 12-15 stitches per inch	1 dart stitched at 12-15 stitches per inch	All darts stitched at 16-18 or 6-10 stitches per inch	10. <u> </u>
<u>11.</u>	4 darts stitched with correct tension	Tension incorrect on 1 dart/or slightly incorrect for all	Tension is incorrect on 2 or 3 darts/or considerably incorrect for all	Tension extremely incorrect on all darts	11. <u> </u>
<u> </u>	Subtotal			Subtotal <u> </u>	

PLAIN SEAMS

<u>12.</u>	One line of stitching on both side seams (excluding basting)	Second line on part of one seam	Second line on parts of both seams	Two lines of stitching on all of both seams or holes in seam allowance	12. <u> </u>
<u>13.</u>	Side seams are stitched straight	Side seams straight except for 1 or 2 places	Crooked in most places	Side seams extremely crooked	13. <u> </u>
<u>14.</u>	No puckers or pleats on the side seams and side seam opened	One seam has puckers or pleats or unopened seam	Both have some puckers, pleats, or gaps and unopened seams or zipper opening sewn shut	Large amount of puckers and pleats	14. <u> </u>

	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	
<u>15.</u> Upper and bobbin tension correct on both seams	Tension is slightly incorrect in some places	Tension is incorrect in most places	Tension is incorrect in all places		15. <u> </u>
<u>16.</u> The number of stitches per inch for both seams is 12-15 stitches per inch	One side seam is 16-18 or 8-10 stitches per inch	Both side seams at 16-18 or 8-10 stitches per inch	Both side seams at 6-8 stitches per inch		16. <u> </u>
<u> </u> Subtotal					Subtotal <u> </u>

SEAM FINISH

<u>17.</u> Appropriate seam finish for fabric	Will stop the fabric from ravelling but could be improved	Not appropriate to fabric (still ravel badly)	No seam finish on garment		17. <u> </u>
<u>18.</u> Seam finish stitched with correct tension or cut with keen edge	Tension or cutting is in need of improvement in a few places	Tension or cutting needs improvement in several places	Tension or cutting is poor in most places or omitted		18. <u> </u>
<u>19.</u> Cutting and/or stitching is straight	Crooked in one or two places	Crooked in three or four places	Crooked all over or omitted		19. <u> </u>

<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	
___ 20. Seam allowance is no less than 1/2" after seam finish applied (unless altered)	Seam allowance no less than 3/8" or more than 5/8" after seam finish is applied	Seam allowance no less than 1/4" or more than 3/4" after seam finish is applied	Little seam allowance left or too much with seam finish omitted	20. ___
_____ Subtotal			Subtotal _____	

ZIPPER

___ 21. 3/8" or 1/2" lap on zipper	Lap is 1/4" or 5/8"	Lap is wider than 5/8" and/or raw edge not caught	Lap is not secured in stitching or omitted	21. ___
___ 22. Straight stitching on outside lap with correct tension	Crooked in 1 or 2 places and/or incorrect tension	Crooked in 3 or 4 places	Stitching is extremely crooked all the way	22. ___
___ 23. Narrow fold right next to zipper teeth	Narrow fold 1/8" away in some places	1/4" away from zipper teeth in some places	Narrow fold omitted	23. ___
___ 24. Stitching straight within 1/8" from fold with correct tension	Stitching crooked in some places, and/or not 1/8" from fold, and/or incorrect tension	Stitching crooked in most places	Stitching extremely crooked and too far from fold	24. ___

<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
___25. No gap at top and no pleat at the bottom	Gaps at top or pleats at bottom in small amounts	Gap and pleat visible but in small amount	Gaps and pleats 25. ___ extremely noticeable
___26. 1/2" left at top for hook and eye	3/8" or 5/8" left at top for hook and eye	1/4" or 3/4" or more left at top for hook and eye	Zipper comes to 26. ___ top of skirt-- no room left for hook and eye or stitching not up to the top of zipper
_____ Subtotal			Subtotal _____

FACING

___27. Side seam matched to facing seam	1/8" difference between side seams	1/4" difference between side seams	Difference is 27. ___ 3/8" or greater
___28. Stitched to waistline with no puckers, darts flat and toward center, seams flat and open with correct tension	Seam and/or 1 dart sewn puckered or folded and/or incorrect tension	2 or 3 darts and/ or seam sewn folded or puckered or tension incorrect	All darts and 28. ___ side seams sewn folded or puckered and/or tension incorrect
___29. Facing edges even when zipper is closed	Uneven within 1/8"	Uneven within 1/4" to 3/8"	Extremely 29. ___ uneven

<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	
__30. Lays smooth, on grainline	Has 1 or 2 wrinkles	Has 3 or 4 wrinkles	Wrinkled all over	30. __
_____ Subtotal			Subtotal _____	

HOOK AND EYE

__31. Hook placed right at top and end of hook is right at lap edge	Hook is 1/8" from top and/or 1/8" from lap edge	Hook is 1/4" from top and/or 1/4" from lap edge	No hook applied or more than 1/4" from edges	31. __
__32. Bar eye placed right at top and 1/8" from narrow fold edge	Bar eye placed 1/8" from top and 1/4" from narrow fold or less than 1/8"	Bar eye 1/4" from top and 3/8" from edge and/or backwards	Bar eye not applied or upside down	32. __
__33. Appropriate stitch and end of hook secured	Stitch appropriate but could be improved and/or end not secured	Stitched poorly and end of hook not secured	Poor stitching loose or insufficient stitches, hook not secured	33. __
__34. There is no gap caused by hook and eye when garment closed	There is slight gap of 1/8"	Gap of 1/4" to 3/8"	Zipper is bent when hook and eye is closed or extreme gap	34. __
_____ Subtotal			Subtotal _____	

	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>	
<u>HEM</u>					
___35. Appropriate finish		Finish could be more appropriate	Finish will not prevent ravelling or fabric too bulky	No finish used	35. ___
___36. Stitching and/or cutting on finish done correctly		Stitching and/or cutting uneven in 1 or 2 places	Stitching and/or cutting uneven in 3 or 4 places	Stitching and/or cutting extremely uneven	36. ___
___37. Hem depth is 2 to 2-1/4" after finish is applied		Hem depth not 2 to 2-1/4" in 1 or 2 places	Hem depth not 2 to 2-1/4" in 3 or 4 places	Hem depth extremely uneven and/or not 2 to 2-1/4"	37. ___
___38. Both side seams are matched		1 side seam is off 1/8" or 1/4"	Both are off 1/8" to 1/4" and/or 1 is off more than 1/4"	Both are off more than 1/4"	38. ___
___39. Hem stitch correct and neatly sewn		Hem stitch correct but needs improvement	Hem stitch correct but poorly stitched or insufficient stitches	Hem stitch incorrect and/or insufficient stitches	39. ___
___40. Hem is smooth and flat		Wrinkles in a few places	Wrinkles in several places	Extreme amount of wrinkles, does not lie smooth and flat	40. ___
_____ Subtotal				Subtotal _____	
===== Grand Total				Grand Total =====	

TEST DATA - JUDGE NUMBER 1

STUDENT NO.	STAY-STITCH		DART		PLAIN SEAM		SEAM FINISH		ZIPPER		FACING		HOOK & EYE		HEM	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
1	13	15	15	17	13	12	11	12	0	13	7	11	0	8	3	18
2	12	15	13	16	10	13	0	10	0	15	6	12	3	10	9	18
3	0	15	11	17	11	15	0	14	0	18	6	12	0	12	0	15
4	9	13	14	18	1	13	9	9	2	13	2	10	2	7	6	12
5	8	15	0	15	0	15	0	12	0	17	0	12	0	12	0	18
6	9	15	17	17	10	15	0	12	0	17	3	11	0	12	0	18
7	0	15	9	16	9	12	0	10	0	14	4	12	0	10	3	12
8	13	15	15	18	13	15	11	12	0	16	0	12	6	11	4	16
9	13	15	7	16	12	13	0	9	4	13	6	11	2	10	11	18
10	12	15	12	18	12	15	9	9	4	17	2	12	0	12	2	13
11	12	14	8	18	15	14	0	12	0	18	6	11	0	12	11	15
12	0	15	0	14	0	14	0	11	0	17	0	12	0	11	0	17
13	0	15	7	17	8	15	9	12	0	17	6	11	0	8	9	14
14	0	15	14	16	13	15	0	10	0	18	0	12	0	12	0	15
15	12	15	11	16	10	15	0	11	0	10	2	12	0	11	0	16
16	15	15	8	13	12	15	0	11	0	18	0	12	0	11	0	17
17	0	15	10	15	8	15	0	12	1	18	4	11	0	10	3	15
18	0	15	0	17	13	12	0	9	0	15	0	11	0	6	0	16
19	13	15	11	14	13	14	0	10	0	16	5	11	0	10	2	15
20	0	15	13	17	13	14	0	8	0	17	6	11	0	10	4	15
21	15	15	11	14	13	13	0	12	0	14	0	12	0	8	0	18
22	11	14	9	15	6	11	0	9	0	15	2	12	0	10	0	11
23	9	15	13	17	13	15	0	12	1	18	5	12	6	9	8	16
24	8	13	5	16	9	15	0	12	0	16	0	10	0	9	0	12
25	13	14	11	17	15	15	5	10	0	18	6	10	1	9	7	15
26	0	14	0	17	0	15	0	12	0	18	0	10	0	12	0	15

TEST DATA - JUDGE NUMBER 1

STUDENT NO.	STAY-STITCH		DART		PLAIN SEAM		SEAM FINISH		ZIPPER		FACING		HOOK & EYE		HEM	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
27	0	15	11	17	13	13	0	11	0	15	11	12	0	11	9	16
28	0	14	0	15	0	14	0	12	0	14	0	11	0	10	0	13
29	0	15	8	17	13	12	0	12	0	18	4	10	0	10	9	16
30	0	14	14	14	0	15	0	9	0	14	0	12	0	10	0	12
31	0	15	0	12	13	14	0	11	0	16	0	12	0	12	0	18
32	0	15	0	11	0	13	0	12	0	17	0	12	0	9	0	15
33	8	15	7	18	11	14	0	10	1	13	0	11	2	5	2	10
34	15	15	15	18	15	15	0	12	1	18	11	12	5	12	6	18
35	11	14	9	17	13	15	0	10	1	16	0	12	1	9	4	18
36	9	15	8	13	13	13	0	9	1	13	0	12	0	8	0	16
37	7	15	13	18	12	15	0	9	4	14	6	12	1	11	7	15
38	0	15	10	13	8	15	8	12	0	18	0	7	0	11	2	7
39	0	15	18	17	15	15	0	8	0	17	11	12	0	8	1	16
40	0	15	0	17	12	14	0	11	0	15	0	11	0	11	0	14
41	9	15	7	16	12	13	0	12	1	14	0	12	0	7	0	16
42	11	15	13	14	11	11	0	9	0	18	2	10	0	8	1	15
43	9	12	4	10	9	14	0	7	0	11	1	12	0	6	1	11
44	9	15	14	12	13	12	0	11	0	18	0	11	0	6	0	13
45	0	14	0	12	0	14	0	9	0	15	0	9	0	6	0	15
46	0	15	0	17	0	12	0	11	0	15	0	12	0	10	0	16
47	6	15	3	16	3	14	0	6	0	17	3	12	0	9	2	15
48	10	15	14	14	10	15	0	9	0	16	3	12	0	11	6	16
49	0	14	0	15	0	12	0	12	0	17	0	12	0	12	0	14
50	7	12	4	14	9	13	0	12	1	11	0	10	0	6	2	13
51	0	13	0	8	6	15	0	12	0	14	0	12	0	4	0	13
52	0	14	14	8	13	15	0	9	0	12	0	12	0	6	0	17

TEST DATA - JUDGE NUMBER 2

STUD- ENT NO.	STAY- STITCH		DART		PLAIN SEAM		SEAM FINISH		ZIPPER		FACING		HOOK & EYE		HEM	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
1	13	14	17	16	12	13	12	12	0	13	4	12	0	9	0	16
2	14	14	14	17	12	14	0	11	0	17	7	11	0	10	15	18
3	0	13	13	17	10	15	0	12	0	14	4	11	0	10	0	16
4	11	13	14	16	15	14	8	9	0	16	1	8	0	3	4	11
5	14	14	0	14	0	14	0	11	0	15	0	11	0	12	0	16
6	0	14	15	18	15	15	0	10	0	15	5	12	0	8	0	16
7	10	15	10	13	14	12	7	11	0	17	4	10	0	11	5	11
8	14	14	16	17	12	14	10	10	0	16	0	11	7	9	2	17
9	14	15	9	15	11	14	0	6	0	11	6	10	0	7	13	16
10	12	13	12	17	13	14	9	7	0	16	2	11	0	12	3	13
11	13	13	9	17	13	15	0	12	0	15	4	11	0	8	7	15
12	0	15	0	18	0	15	0	11	0	16	0	11	0	11	0	17
13	0	15	14	16	10	15	6	10	0	13	3	11	0	6	12	13
14	0	15	12	16	15	15	0	9	0	14	0	12	0	9	0	12
15	14	15	10	18	11	14	0	8	0	9	0	11	0	6	0	12
16	15	14	13	12	15	14	0	10	0	16	0	12	0	11	0	16
17	11	15	11	15	13	14	0	11	0	16	0	12	0	9	0	15
18	0	14	0	15	15	14	0	10	0	15	0	10	0	4	0	13
19	14	14	15	13	15	14	0	11	0	16	0	11	0	11	0	10
20	0	13	10	17	13	13	0	7	0	16	7	12	0	9	0	13
21	14	14	13	14	15	15	0	12	0	14	0	12	0	8	0	17
22	11	14	13	17	8	13	0	7	0	15	0	11	0	9	0	14
23	12	14	11	17	13	15	0	12	0	17	5	12	0	8	5	13
24	11	12	6	13	11	14	0	11	0	15	0	9	0	4	0	12
25	14	14	18	17	13	15	5	10	0	15	6	11	0	5	10	10
26	0	14	0	17	0	15	0	10	0	16	0	10	0	9	0	14

TEST DATA - JUDGE NUMBER 2

STUD- ENT NO.	STAY- STITCH		DART		PLAIN SEAM		SEAM FINISH		ZIPPER		FACING		HOOK & EYE		HEM	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
27	0	13	11	17	15	14	0	10	0	13	9	12	0	8	10	15
28	0	14	0	16	0	14	0	10	0	14	0	10	0	11	0	11
29	0	14	14	16	13	12	0	10	0	16	1	9	0	9	11	18
30	0	13	15	18	0	14	0	9	0	15	0	12	0	9	0	13
31	0	15	0	14	15	15	0	12	0	17	0	12	0	9	0	14
32	0	15	0	14	0	13	0	10	0	17	0	10	0	4	0	14
33	10	14	9	17	12	14	0	7	0	14	0	11	0	5	2	15
34	14	15	17	18	15	14	0	11	0	15	12	12	0	6	10	18
35	13	13	9	17	12	15	0	8	0	13	0	10	0	8	9	17
36	11	13	10	14	14	14	0	10	0	15	0	11	0	4	0	15
37	9	14	16	18	15	15	10	11	0	14	3	12	0	9	11	14
38	10	14	13	13	8	14	9	9	0	14	0	9	0	8	0	10
39	0	12	18	18	15	15	0	10	0	16	12	12	0	9	0	13
40	0	14	0	16	15	14	0	12	0	10	0	11	0	5	0	15
41	10	14	10	16	12	15	0	11	0	11	0	11	0	7	0	15
42	14	15	15	17	13	13	0	6	0	16	0	12	0	8	0	11
43	4	12	2	15	12	15	0	4	0	13	0	9	0	8	0	11
44	12	13	13	13	13	12	0	11	0	15	0	9	0	7	0	10
45	0	14	0	14	0	14	0	11	0	12	0	11	0	3	0	15
46	0	14	0	16	0	14	0	9	0	16	0	9	0	6	0	16
47	7	14	3	17	5	14	0	8	0	14	0	10	0	9	5	12
48	0	14	12	14	10	13	0	8	0	10	4	12	0	11	5	15
49	0	12	0	13	0	12	0	12	0	14	0	12	0	9	0	15
50	10	11	13	16	9	12	0	7	0	12	0	11	0	6	2	7
51	0	13	0	9	0	15	0	12	0	14	0	11	0	6	0	14
52	0	13	17	8	15	14	0	10	0	13	0	11	0	2	0	12

TEST DATA - JUDGE NUMBER 3

STUDENT NO.	STAY-STITCH		DART		PLAIN SEAM		SEAM FINISH		ZIPPER		FACING		HOOK & EYE		HEM	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
1	13	15	17	15	12	15	11	10	0	13	9	9	0	12	3	15
2	13	15	16	16	11	14	0	11	0	18	6	12	1	12	9	18
3	0	15	13	14	11	15	0	12	0	17	2	11	0	11	0	16
4	10	13	15	16	11	13	8	10	0	15	3	10	0	8	5	12
5	12	12	0	14	0	15	0	12	0	14	0	12	0	12	0	17
6	0	15	16	17	10	14	0	11	0	17	4	12	0	12	0	18
7	0	12	11	15	10	12	9	9	0	17	3	9	0	12	2	13
8	13	15	17	14	12	14	11	10	0	16	0	11	0	11	3	15
9	12	15	8	15	12	15	0	10	1	16	5	12	1	12	11	18
10	12	15	14	17	12	14	9	10	3	17	3	12	0	12	4	17
11	13	14	9	17	14	14	0	11	1	16	9	11	0	10	10	15
12	0	15	0	18	0	14	0	11	0	18	0	12	0	12	0	17
13	13	15	13	18	11	14	9	12	0	17	8	12	0	11	9	15
14	0	15	14	14	15	15	0	11	0	16	0	12	0	12	0	15
15	12	14	12	16	10	13	0	9	0	11	2	11	0	10	0	16
16	15	15	13	15	12	15	0	9	0	18	0	12	0	12	0	17
17	0	14	12	17	12	14	3	11	0	17	4	12	0	11	3	15
18	0	15	0	16	9	14	0	11	0	17	0	11	0	11	0	16
19	12	15	11	14	11	13	0	11	0	17	7	11	0	11	0	12
20	0	14	14	15	13	14	0	9	0	18	6	11	0	11	0	17
21	13	15	14	16	12	14	0	12	0	17	0	12	0	11	0	16
22	11	14	10	13	8	12	0	9	0	12	2	11	0	10	0	16
23	10	14	16	14	11	14	0	12	2	18	5	11	3	9	4	13
24	9	13	6	13	14	13	0	11	0	17	0	10	0	11	0	16
25	13	15	18	14	15	15	7	9	0	17	6	11	1	11	10	15
26	0	15	0	16	0	15	0	11	0	17	0	9	0	11	0	14

TEST DATA - JUDGE NUMBER 3

STUD- ENT NO.	STAY- STITCH		DART		PLAIN SEAM		SEAM FINISH		ZIPPER		FACING		HOOK & EYE		HEM	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
27	0	15	13	17	12	15	0	9	0	16	5	12	0	10	9	13
28	0	14	0	18	0	10	0	12	0	16	0	11	0	11	0	15
29	0	14	13	16	14	10	0	11	0	17	5	11	0	9	8	18
30	0	15	17	15	0	14	0	11	0	17	0	12	0	11	0	11
31	0	15	0	13	10	14	0	12	0	18	0	12	0	12	0	17
32	0	15	0	14	0	13	0	12	0	17	0	12	0	10	0	14
33	9	14	11	16	12	14	0	9	1	15	0	12	2	9	3	14
34	13	15	17	16	15	13	0	12	3	18	9	12	5	11	7	17
35	13	15	7	16	11	15	0	10	1	14	0	10	1	10	6	18
36	12	15	11	15	12	14	0	11	0	16	0	12	0	10	0	16
37	6	15	13	17	11	15	0	9	2	17	4	12	1	12	10	13
38	11	15	13	16	12	14	11	12	0	17	0	10	0	11	1	11
39	0	15	17	17	14	14	0	10	0	15	12	12	0	9	0	17
40	0	15	0	13	14	12	0	12	0	16	0	12	0	9	0	13
41	10	15	12	16	13	12	0	12	1	13	0	11	0	9	0	16
42	12	15	16	15	11	12	0	11	0	18	2	12	0	10	0	12
43	8	13	7	9	12	13	0	8	0	14	1	11	0	9	1	11
44	9	15	15	13	10	12	0	11	0	17	0	9	0	10	0	10
45	0	12	0	16	0	13	0	11	0	14	0	10	0	7	0	13
46	0	15	0	17	0	15	0	12	0	17	0	12	0	12	0	17
47	0	15	4	14	7	15	0	7	0	16	3	11	0	10	0	15
48	0	15	16	12	9	14	0	10	0	15	4	12	0	11	7	14
49	0	11	0	14	0	10	0	11	0	15	0	12	0	10	0	14
50	9	11	15	15	9	11	0	11	1	15	0	12	0	9	4	11
51	0	15	0	11	6	15	0	12	0	16	0	11	0	9	0	16
52	0	15	17	10	12	15	0	11	0	14	0	12	0	8	0	17

TEST DATA - JUDGE NUMBER 4

STUD- ENT NO.	STAY- STITCH		DART		PLAIN SEAM		SEAM FINISH		ZIPPER		FACING		HOOK & EYE		HEM	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
1	13	15	16	16	13	13	9	11	0	13	3	11	0	11	0	16
2	13	15	16	17	10	14	0	9	0	17	5	10	1	11	6	17
3	0	15	15	16	11	14	0	12	0	15	3	11	0	10	0	11
4	12	12	14	15	12	12	8	9	0	16	0	9	0	8	2	11
5	14	14	0	16	0	14	0	11	0	15	0	10	0	10	0	14
6	0	14	16	16	11	15	0	9	0	16	3	11	0	9	0	18
7	12	14	11	15	12	9	5	9	3	15	1	10	0	11	0	13
8	13	15	17	17	13	15	9	11	0	16	0	12	8	10	0	15
9	14	14	12	13	12	13	0	8	0	12	2	11	1	8	14	15
10	11	14	12	17	14	13	7	8	2	17	0	10	0	11	4	13
11	14	13	11	18	14	15	0	10	5	13	3	11	0	10	9	14
12	0	14	0	17	0	14	0	11	0	17	0	10	0	12	0	16
13	0	15	15	17	8	14	8	12	0	15	3	9	0	9	13	14
14	0	15	16	16	14	15	0	10	0	13	0	11	0	10	0	15
15	12	15	9	12	10	14	0	11	0	11	0	9	0	6	0	13
16	12	15	9	11	11	14	0	11	0	16	0	12	0	11	0	17
17	0	15	14	17	8	15	0	11	0	17	2	11	0	10	0	14
18	0	15	0	18	10	13	0	11	0	15	0	10	0	10	0	16
19	14	15	12	13	12	13	0	10	0	15	5	9	0	11	0	14
20	0	13	17	16	11	14	0	10	0	17	5	11	0	11	0	16
21	14	15	15	17	12	12	0	12	0	16	0	11	0	9	0	15
22	11	15	9	15	7	9	0	8	0	15	0	9	0	10	0	11
23	12	15	16	18	13	14	0	12	2	17	2	10	0	9	4	15
24	10	13	5	13	13	12	0	10	0	17	0	9	0	9	0	11
25	13	15	13	15	15	14	9	10	0	16	3	11	0	9	10	14
26	0	15	0	17	0	14	0	11	0	17	0	8	0	10	0	14

TEST DATA - JUDGE NUMBER 4

STUDENT NO.	STAY- STITCH		DART		PLAIN SEAM		SEAM FINISH		ZIPPER		FACING		HOOK & EYE		HEM	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
27	0	13	17	18	13	12	0	7	0	16	7	12	0	9	7	15
28	0	14	0	18	0	14	0	10	0	12	0	10	0	11	0	15
29	0	15	15	15	13	12	0	11	0	16	1	10	0	10	8	17
30	0	13	14	16	0	13	0	8	0	15	0	10	0	10	0	10
31	0	15	0	13	13	14	0	11	0	15	0	9	0	12	0	17
32	0	15	0	15	0	11	0	12	0	17	0	11	0	5	0	16
33	11	13	8	16	13	13	0	9	1	13	0	10	0	10	0	14
34	14	15	17	18	15	15	0	10	6	15	7	12	7	8	10	16
35	11	15	11	16	11	14	0	8	0	13	0	12	0	9	6	17
36	11	14	9	12	14	12	0	9	0	16	0	12	0	5	0	15
37	11	15	16	18	11	14	0	9	6	14	3	11	0	12	13	15
38	0	15	10	15	10	13	10	10	0	17	0	11	0	10	0	11
39	0	15	17	16	14	15	0	10	0	16	8	8	0	8	0	18
40	0	14	0	15	15	13	0	11	0	13	0	8	0	6	0	12
41	8	15	9	15	13	12	0	11	0	14	0	11	0	8	0	15
42	14	13	17	15	12	12	0	8	0	16	1	10	0	7	0	13
43	12	11	4	11	12	10	0	7	0	11	0	9	0	8	0	12
44	10	14	14	12	11	12	0	11	0	15	0	7	0	8	0	13
45	0	13	0	16	0	12	0	9	0	16	0	9	0	4	0	13
46	0	15	0	16	0	12	0	11	0	16	0	11	0	10	0	16
47	6	15	5	15	3	14	0	8	0	13	0	8	0	8	3	13
48	0	15	16	16	8	12	0	7	0	12	0	9	0	11	5	18
49	0	12	0	14	0	11	0	11	0	14	0	10	0	9	0	15
50	9	13	12	14	9	10	9	9	0	13	0	9	0	6	3	9
51	0	14	0	13	3	14	0	12	0	18	0	9	0	9	0	17
52	0	14	15	5	10	14	0	9	0	13	0	11	0	6	0	16