

AN ABSTRACT OF THE THESIS OF

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Title: ANALYSIS OF FACTORS INFLUENCING CREATIVITY

DISPLAYED THROUGH CLOTHING CONSTRUCTION PROJECTS

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The purpose of this study was to investigate the relationship between introductory lessons on creativity and the creativity displayed in students' finished clothing projects. The sample consisted of 22 students in the experimental group and 26 students in the control group at the intermediate level in high school clothing construction.

A measure was developed to evaluate the quantity of creative production evident in finished garments. The control and the experimental groups were each administered two tests of creative ability from the Sheridan Psychological Service, Inc. The experimental groups received lessons designed to give experiences in creative ideas applicable to clothing construction.

Statistical analysis of the data included the coefficient of correlation used to study the relationship of the creative lessons to creative production exhibited in the

finished garments; the regression coefficient was used to compare the pre and post tests on predictability of creativity in constructed garments.

The study showed no statistical difference between lessons on creativity and the creative production in the constructed clothing items in both the experimental and control groups. (Visual evidence in the garments in one class indicated the lessons on creativity increased the creative production of some students.) No significant correlation was found between creative ability of the students and the creative production of the students' garments.

Analysis of Factors Influencing Creativity  
Displayed Through Clothing Construction Projects

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## TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
I	STATEMENT OF THE PROBLEM . . . . . 1
	Need and Background for the Study. . . . . 2
	Hypotheses . . . . . 3
	Objectives . . . . . 4
	Limitations of the Study . . . . . 4
	Definition of Terms. . . . . 5
II	REVIEW OF LITERATURE . . . . . 7
	The Creative Process . . . . . 8
	The Creative Person. . . . . 11
	Creative Production and the Environment. . . . . 13
III	PROCEDURE. . . . . 16
	Introduction . . . . . 16
	Sample . . . . . 16
	Measures Employed. . . . . 18
	Test of Creative Ability . . . . . 18
	Teacher Workshop . . . . . 20
	Lesson Plans, Development and Administration . . . . . 22
	Administration of Measures . . . . . 26
	Tests of Creative Ability. . . . . 26
	Selection of a Panel . . . . . 26
	Evaluation of Finished Garment . . . . . 27
IV	RESULTS. . . . . 29
	Tests of Creative Ability. . . . . 29
	Creative Product Results . . . . . 30
	Correlations . . . . . 33
	Regression Analysis. . . . . 33
V	CONCLUSION AND DISCUSSION. . . . . 36
VI	SUMMARY AND RECOMMENDATIONS. . . . . 41
	Summary. . . . . 41
	Recommendations. . . . . 43
	Recommendations for Improvement of the Study. . . . . 44
	Recommendations for Further Study. . . . . 45

Table of Contents -- continued

<u>Chapter</u>	<u>Page</u>
BIBLIOGRAPHY . . . . .	48
APPENDICES	
Appendix A: Outline for Teacher Workshop . . . . .	53
Appendix B: Checklist for Classroom Instruction . . . . .	56
Appendix C: Outline of Teaching Lessons .	58
Appendix D: Teaching Aids and Exercises .	63
Appendix E: Creative Clothing Evaluation Form. . . . .	69
Appendix F: Raw Scores of Control and Experimental Groups . . . . .	71



LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Comparison of Mean and Standard Deviation Between the Experimental and Control Groups on Two Tests for Creative Ability . . . . .	30
2	Comparison of Mean and Standard Deviations Between the Experimental and Control Groups on Creative Product Score . . . . .	30
3	Group Mean and Standard Deviation for the Creative Ability Tests and Creative Product Scores. . . . .	31
4	Comparison of Means and Standard Deviation for the Five Groups on the Creative Product . .	32
5	Comparison of Class Creative Ability Test Scores and Class Creative Product Scores . . .	33
6	Comparison of Creative Production Scores with Creative Test Scores as Predictors of Creative Production. . . . .	34

ANALYSIS OF FACTORS INFLUENCING CREATIVITY  
DISPLAYED THROUGH CLOTHING CONSTRUCTION PROJECTS

INTRODUCTION

I. STATEMENT OF THE PROBLEM

Although the nature of creative talent is still being revealed through new research, there is evidence that creativity can be encouraged by environmental conditions. Torrance has written creative capabilities can be developed through educational programs which stimulate curiosity and imagination (Torrance, 1962). Training, knowledge and ability are factors that contribute to differences in exhibited creativity. Creative skills can be taught. Lessons need to be developed that encourage or require students to be original. The classroom teacher has the responsibility to establish an environment that favors and encourages the students to develop ideas (Torrance, 1965). While the literature is clearly supportive of this position, very little research has been conducted to determine if this is the case in clothing design and construction.

The purpose of this study was to investigate whether student creativity as exhibited in students' finished clothing projects could be developed as a result of teaching efforts designed to encourage creativeness in clothing design and construction.

### Need and Background for the Study

The need for the study was based on the premise that all students have creative potential and that the teacher has a responsibility to create an environment that encourages and stimulates the students so their creative potential can be realized (Gowan, et al., 1967). Creative potential can be fostered and developed in children and youth through creative teaching and guidance (Zirbes, 1959). The teacher can develop student potential through lessons that encourage students to investigate beyond the obvious, to experiment with new ideas, and to elaborate with materials (Torrance, 1970). According to Lafayette (1972), "Creative instruction resides in the ability of the instructor to produce or bring about an atmosphere where students have unlimited opportunity to create." Thus it is challenging to teach creatively, for the teacher needs to be prepared both technically and psychologically (Lessinger, 1967).

Unfortunately, educational conditions do not always favor the development of creative potential. Some circumstances obstruct, blight or deny its growth (Zirbes, 1959). Pressure to conform, over-emphasis on grades or the right answer, time limits and hostility in the classroom seem to limit or suppress creativity (Torrance, 1964). Most students cannot or will not engage in creative activities in an environment that is threatening.

In the classroom, students' creative productivity is dependent on a background of related experiences, the development of an urge to express themselves, the accessibility of a variety of materials, time, a permissive work atmosphere and a teacher experienced in creative activities (Rubin, 1962, p. 64). Additionally, the attainment of those conditions requires teachers to engender an atmosphere for student creativity.

### Hypotheses

This study was an investigation of the relationship between introductory teaching lessons on creativity in clothing construction, daily teacher assistance, and students' creative production. The following null hypotheses were tested:

- H<sub>0</sub>.1. There is no relationship between the creative ability of the student and the creative production of the clothing item constructed by the student.
- H<sub>0</sub>.2. There is no relationship between the presentation of lessons designed to emphasize creativity and the creative production exhibited in the finished student garments.
- H<sub>0</sub>.3. There is no relationship between teacher assistance and student creative production as evidenced in the finished garment.

### Objectives

The objectives of the study were:

1. To determine the correlation of students' creative ability to their exhibited creative production in clothing construction.
  - a. Assess the students' creative ability.
  - b. Assess the creative production exhibited in clothing construction projects.
2. To determine if there is a relationship between teacher assistance and student creative production.
3. To determine if presentation of lessons related to creativity influences the creative production exhibited in the finished garment of the student.

### Limitations of the Study

The investigation was limited by the following:

1. The difference which might exist in creative clothing production between boys and girls, as no boys were enrolled in the classes.
2. The effects of background experiences prior to enrolling in the intermediate level of clothing construction.
3. The effort or motivation of students applied to the tests of creative ability or garment creativity.

4. The relative importance of introductory lessons as compared to daily teacher assistance on creative production.
5. The quality of teachers' instruction.

In addition, the study was limited to investigation of creativity as evidenced by selection of materials and application of design to constructed garments.

#### Definition of Terms

1. Creative process: "process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies; testing and retesting these hypotheses and probably modifying and retesting them; and finally communicating the results" (Torrance, 1966, p. 6).
2. Creativity: "... the process of sensing gaps or disturbing, missing elements; forming ideas or hypotheses concerning them; testing these hypotheses; and communicating the results, possibly modifying and retesting the hypotheses" (Torrance, 1972, p. 16).
3. Convergent thinking: thinking of an analytical nature that leads one to the best accepted, or most conventional answer.

4. Divergent production: the generation of a variety of ideas from given information.
5. Divergent thinking: thinking which moves in an unusual direction and which involves a degree of searching.
6. Ideation: the rapid listing of ideas or words in a specific category.
7. Intermediate level: the clothing construction skill of high school students ranging from tenth to twelfth grade who have mastered the basic skills such as seams, darts, zippers, and some facing techniques.
8. Originality: the uniqueness of ideas.

## II. REVIEW OF LITERATURE

Through the need for creativity man has satisfied his curiosity, expressed himself, used his talents, and developed his culture from cave society to the complex world which each person must face today (Gade, 1974). Why does man create? What does it mean to be creative? These are complex questions. Man has always created, sometimes for fun, sometimes for specific needs.

Creativity is probably the most unique of all of man's powers and abilities (Gowan et al., 1967). Creativity is complex, involving a combination of abilities and the desire to act. Creativity can be critical thinking, curiosity, ingenuity, experimentation, originality, or the ability to spontaneously try something different with an object. Several authors, including Rookey (n.d.) and Rhodes (1961), have grouped definitions into four subgroups: (1) the creative person, (2) the creative process, (3) the press (or interaction of the person and his environment), and (4) the product. Torrance adds further support for these definition groups: "Thus it seems inevitable to me that a thorough understanding of creativity must involve the study of all aspects of creativity (person, process, product, and press)" (Torrance, 1961, p. 8).

Information obtained from materials examined for this study was grouped into the following categories: the



creative process, the creative person, and creative teaching and the environment. Section one summarizes the creative process. The next section includes characteristics and situations that facilitate creativity in the creative person. Creative production and the environment are dealt with in the third section.

### The Creative Process

The process of developing creativity has been recognized to be a valuable experience. As stated by Maslow, "any factors that would produce a more creative person would also make a man a better father, a better teacher or better citizen, or a better dancer, and a better anything..." (Maslow, 1972, p. 290).

Definitions explaining the creative process explore what causes one to strive to the creative stage of thinking. Torrance defines creativity as:

"...the process of sensing gaps or disturbing, missing elements; forming ideas or hypotheses concerning them; testing these hypotheses; and communicating the results, possibly modifying and retesting the hypotheses" (Torrance, 1972, p. 16).

Most authors describe the traditional view of the creative process in terms of four progressive steps. The first step generally is a period of preparation in which there is sensing of the need, acquiring skills, techniques and experience, in order to pose a question. Step two is a period of incubation or a period of withdrawal to allow the new

idea to develop in the unconscious mind. Thereafter, with step three comes illumination or the birth of a new idea. The final step is one of experimentation to verify, evaluate and eventually perfect the best ideas. The process may result in new products, the development of new approaches or methods through such techniques as substituting, revising, subtracting, modifying, adding to or adapting (Guilford, 1973; Miel, 1963; Alamshah, 1967).

The necessary skills used in working through the creative process have been studied by several persons. Guilford has done extensive work on the nature of basic abilities and other traits that contribute to creative performance. He has categorized creative thinking abilities, and designed and identified tasks used to assess each ability.

Guilford has designed a theoretical model, called "Structure of Intellect", which is depicted in the shape of a cube with three groups of creative ability called operations, content, and product. Each group of creative abilities is assigned a different plane. Included in Guilford's primary categories termed "operations" are (1) cognitive memory or the simple discovery, recognition or comprehension of information; (2) convergent thinking, analysis and integration of information; (3) divergent thinking, the ability to generate one's own ideas or follow a new direction of thought; and (4) evaluative thinking, the ability to make value decisions, assessments, and

modify previous judgements (Guilford, 1960). "Content" abilities include figural, symbolic, semantic and behavioral abilities. The "product" abilities include units, classes, relations, systems, transformations, and implications. Guilford has continually evaluated and modified his system since its inception in 1950 (Guilford, 1960).

Guilford found that several categories of abilities play a direct role in creative operations. Fluency of thinking refers to the ease with which stored information can be used. Flexibility, or freedom from fixed ideas and habitual ways of solving problems, allows an individual to produce novel products. Originality is part of this category. The third category of creative ability is called elaboration, that is, adding new details to produce an elaborate finished product. Fluency, flexibility, and elaboration are in the general category of divergent production (Rubin, 1962).

Creativity is an aspect of intelligence and is not separate from intelligence. "About 60 components of intelligence are known and at least as many are predicted from a theory regarding the structure of intellect" (Guilford, 1962, p. 32). These are generalized intelligence skills as well as specific skills. The part of intelligence that contributes to creative performance may be regarded as generalized skills that can be improved with practice (Rubin, 1962).

The traditional measures of intelligence are of little value for predicting creativity for they measure very few of the large number of mental skills (Rhodes, 1962). Above an intelligence quotient of 120 there is little correlation between creativity and general intelligence. Getzel and Jackson found that highly creative students and highly intellectual students were equally superior to the total school population; however there were twenty-three points of difference in the average IQ of the two groups (Torrance, 1962), indicating that the IQ measured left areas unevaluated which influenced the superior performance of students.

#### The Creative Person

The capacity to create is not a gift limited to a few people who have many talents and abilities. Many people exhibit certain general characteristics of creativeness. Characteristics of creative persons include curiosity, the willingness or need to question or meet a challenge; the willingness to take risks or seek stress; the ability to become completely absorbed in a task so that one may even be oblivious to the surrounding activities; the willingness to have an independent opinion, to search for honesty and truth; and the willingness to be an individual. Creativity usually involves having a strong self-image, so that one is willing to be in the minority and not conform to group pressures (Torrance, 1970).

In addition to the group of major characteristics, there are other traits which characterize creative persons such as: (1) usually asking many questions, some of which may challenge or test the authority; (2) experimenting with whatever is in the hand; (3) usually having a high energy level that leads to perseverance and originality on projects or problems; (4) liking to work alone; (5) usually being self-confident and open to new experiences; and (6) often appearing not to be working as hard as other students but doing equally well on examinations. Both Guilford and Torrance report that work of creative people tends to be different or unusual from the norm. Other differences include the ability to manipulate and reconstruct ideas, tolerance for ambiguity, humor, and diversity of interest (Guilford, 1973; Hall, 1970; Torrance, 1972; Gowan, Demos, Torrance, 1967).

According to Parnes (1965) and Torrance (1964) there are deterrents that prevent many persons from being creative. Such deterrents include peer pressure, sex and identity pressures (e.g., girls should be involved in domestic activities, not electricity, mechanical gadgets, etc.), and lack of social approval for trying things that are different. Other deterrents applicable to this study include emphasis on usefulness, success, perfection, togetherness; absence of emotional feeling, fear of failure and timidity (Krippner, 1958; Mason, 1960).

One observable phenomenon of creativity is that its level drops at certain ages. For example, peer influence is high at ages five, nine, and twelve years, and creativity is low. Conformity is cited as the cause. Some children at each of these ages never again regain the need to be creative (Torrance, 1964; Gowan, Demos and Torrance, 1967).

#### Creative Production and the Environment

Teachers' values and attitudes are crucial to establish a climate for the development of creativity. Creative teaching is a process of two-way communication (Rubin, 1962). Through the teacher's sensitivity to student's feelings and perceptions, student's positive self-concepts can be developed. If the teacher does not have time or interest for listening to unusual questions or unique problem solutions, creative work usually will not emerge. The teacher needs to provide an environment in which there is concern for individual differences and respect for curious questions and different ideas, in order for each student to feel accepted and willing to take the risk to explore and develop respect for other's ideas (Fleck, 1968; Torrance, 1965; Miel, 1962). Fleck (1968) summarized the importance of the learning environment in saying "creativity thrives best in a classroom offering rich experiences, permissiveness, security and encouragement, and freedom from threats" (p. 292).

Lessinger (1962) has suggested the following ideas for a general image of creative teaching: creative teaching capitalizes on student momentum, offers upgraded curricular experiences, uses conventional approaches but frequently uses unorthodox approaches, displays enthusiasm about subjects, allows time for informal interaction with several students at a time, helps students establish personalized systems of intellectual goals, uses books and printed materials as important resource tools, and uses a variety of evaluative methods, such as objective and essay questions, as well as oral inquiries. Creative teaching often requires the student to use the higher mental levels of Blooms' Taxonomy of Educational Objectives in daily activities in the classroom and learning tasks. These learning activities would include the high levels in both the cognitive and affective domains.

Guilford (1973) designed some questions for teachers to use for evaluating themselves on attitudes towards facilitating creative behavior. Questions included: do you really care about teaching, do you experiment in your teaching, do you really care about children, do you sometimes use flashes of insight which come to you, do students in your class feel free to express ideas contrary to yours, and does your classroom invite new experiences?

Some principles appear clear in planning programs to develop creative skills. Every student has some creative

capabilities which can be developed through educational programs (Gowan, et al., 1967). Two primary types of educational programs are used: (1) those that deliberately train in creative thinking or problem solving skills, and (2) those that use a general creative spirit in each area of the ordinary curriculum (Lytton, 1972). In specific courses, ideas from Osborn's book Applied Imagination are often followed. Osborn stresses the importance and universality of imaginative talent as well as the use of creativeness in all stages of problem-solving from orientation to evaluation. The Osborn's students learn to apply the principles of deferred judgment and techniques for producing ideas (Osborn, et al., 1957).

In Education for the Gifted, Robert Wilson (1958) suggested a variety of teaching devices that can be adapted to develop creative skills in the general curriculum. Teaching devices included (1) brainstorming, (2) developing student sensitivity to problems, (3) encouraging students to be observant, (4) encouraging originality, and (5) developing the ability to redefine or improvise.

Evaluation is the final step in developing creative skills. Students need to be taught standards which are applied to the creative product. The critical thinking process is applied after the product is finished rather than during the process (Guilford, 1962).



### III. PROCEDURE

#### Introduction

The purpose of the study was to investigate the relationship between introductory lessons on creativity and the creativity displayed in high school students' clothing construction projects.

The research design included the following:

1. Selection of the sample
  - a. Three high schools involving intermediate level clothing construction classes
  - b. Two paired control and experimental groups, each taught by one teacher and one control group at the third school
2. Selection of tests of creative ability
  - a. Match Problems: measures originality
  - b. Decoration: measures elaboration or detail
3. Development of lessons on creativity related to clothing construction
4. Teacher workshop with explanation of teacher checklist of classroom instruction
5. Administration of creative ability pretest to experimental and control groups
6. Administration of lessons on creativity by investigator to experimental group
7. Five weeks allowed for garment construction
8. Administration of creative ability, post test to control and experimental groups
9. Selection of panel of home economists to evaluate garments for creative production
10. Rating of garments from control and experimental groups by panel of five home economists

#### Sample

Two high schools in the middle-class suburban community of Beaverton, Oregon, were selected for the study. Each school had at least five clothing construction classes

which were taught by the same teacher. Two intermediate clothing construction classes taught by the same teacher in each school participated in the study. Class size ranged from twelve to twenty-five students. One class in each school served as an experimental group, and the second formed the control group. A third high school provided an additional control group which would not be exposed to possible contamination through communication between control and experimental classes. The additional control class was at the same skill level as the other classes. Because there is marked decrease in creative production at ages nine and twelve as peer pressure to conform increases, high school students were chosen to gain a greater openness to creative work (Torrance, 1962).

The investigator assumed the classes were similar in terms of student intelligence and ability. All students had been randomly assigned to classes regardless of ability or previous skill or ability testing results. All students had previous clothing construction experience.

Twenty-five of the forty-eight students in the control group and nine of the thirty-one students in the experimental group were eliminated from the study because: (1) they were absent for one of the tests, or (2) their garments were not available for rating. Absenteeism was high since it was near the end of the school year.

It should be noted the investigator did not observe the teachers because of past teaching experience with some of the students. It was felt that the investigator's presence might influence the results.

### Measures Employed

#### Test of Creative Ability

A test was needed which would measure the abilities involved in creative work applicable to concrete materials, i.e. figural creativity. The abilities involved in figural creativity are fluency, flexibility, originality, and elaboration. Only originality and elaboration are directly measurable in a clothing construction project. Tests were sought which measured originality and elaboration, which were easily administered, and which were easily scored. The majority of tests concerning creativity are described in the Journal of Creative Behavior, No. 2:117-126, 1971 and No. 3:162-65, 1971. The described tests are designed for a variety of ages and purposes and, on review, were generally not appropriate for this research project.

Two tests "Match Problems" and "Decorations" described in the Journal of Creative Behavior were selected. The test, "Match Problems," (Berger and Guilford), measured the factor technically called divergent production of figural transformation, i.e., originality. The test consisted of drawings of headless matches (match sticks) arranged in

patterns, from which the students created new patterns by removing some of the matches. Each problem had several solutions. The published example was:

Take away 3 matches leaving 4 squares



(Berger, 1963)

Following the scoring guide and key, Match Problems can be scored with a high degree of objectivity. The scoring guide depicts each acceptable solution of a particular problem. An acceptable answer could not be merely a rotation of the same solution; the answer was required to follow a different rule. All remaining matches must be included in the required number of squares.

The two separately timed parts of seven minutes each were scored independently and could be used in computing alternate forms of reliability. A scoring guide was followed for each section, and the two scores were totalled to obtain an originality score.

Several confirming studies have used some form of "Match Problems" to measure originality. Two reported studies which included a large sample of ninth grade students ( $N = 869$ ) and two adult samples of U.S. Air Force aviation students ( $N = 582$ ) were used to establish statistical information for the test. The reliability determined from the correlation of the two segments of the test was reported to be .70 with a standard deviation of .40, and the standard error of measurement was approximately 2.8.

The second test, "Decorations," (Gershon, Gardner, Merrifield, Guilford) measures the ability for divergent production of figural content. More precisely it measured the ability to give details or the ability called elaboration. In the test, students were required to make different decorations for each of two identical outline drawings of objects. Four sets of drawings were provided and each set was to be completed within three minutes.

"Decoration" was scored by counting the number of acceptable responses. Each decoration detail of the identical drawings had to be different to be counted in the score. If the same decoration was repeated it was not counted a second time. The total score was the sum of the acceptable decorative elements for the four drawings (Gershon, et al., 1963).

Research has been conducted to determine if "Decoration" is a consistent measure for elaboration. From a sample of ninth grade students (N = 869) consisting of different IQ levels and sexes, Gershon, et al. (1961) estimated reliability to be close to .80 with a standard deviation of 11.8 for the girls. There was a significant sex difference in favor of the girls, which was attributed to finger speed.

### Teacher Workshop

The investigator planned and conducted a teacher workshop to explain: (1) the research project, (2) the purpose

of the control class, (3) the standardized tests and lesson plans, (4) the teacher checklist of classroom instruction, and (5) the rating of all the garments. By conducting the workshop five days preceding the investigation, a time was provided in advance to consult with each teacher and answer questions.

The teachers were told that by comparing creative production of the control classes with the experimental class, evidence might be gained on the effect of the introductory lessons. The importance of not contaminating the control class through altered teaching methods was emphasized.

Each experimental class teacher was asked to complete a daily checklist of classroom instruction (Appendix B). The purpose of the checklist was to monitor the possible influence of teacher assistance on the students' creative production. The checklist provided a convenient method for the teacher to record the nature and extent of the assistance each student received. The checklist categories to be completed for each student included: whether the teacher made a specific suggestion, made alternative suggestions, helped clarify an idea, taught a construction technique, or gave no assistance. The teacher was requested to list any specific teaching method used, such as binding an edge, matching a fabric design, or matching plaids. Assistance given was tabulated by a simple count of the

number of times given in each category and the number was compared to the creative product score.

The completed garments were rated for a creative product score five weeks later when the students normally turned in their garments for grading. Each student was required to provide the pattern envelope for use in scoring her garment for creativity.

#### Lesson Plans, Development and Administration

The lesson plans on creativity were designed to: (1) provide information on the nature of creativity and its importance to each person, (2) provide learning experiences in divergent production areas of flexibility, elaboration and originality, (3) stimulate and encourage the students to be unique or different from the pattern companies' suggestions in their clothing construction garments, and (4) provide a variety of experiences with materials and methods that could be used on clothing projects to make the garment different or unique.

Three days of teaching lesson plans (approximately 150 minutes) were developed by using the writer's ideas, and ideas from Gade, 1974. An outline of and activities for the lessons are included in Appendices C and D. The outline was carefully followed to insure consistency within the experimental classes.

The lessons began with a general explanation of creativity including ways to be a more creative thinker. To gain flexibility in production of ideas, the class brainstormed for ways to be creative in clothing construction. Each class listed eighteen to twenty ideas.

A slide presentation was prepared and shown to stimulate the students' thinking as to techniques that could be used on their garments. The slides showed garments which used: mixture of fabrics; simple and elaborate appliques on shirts; embroidery on bodices, vests, skirts, and yokes; patchwork in velvets, wools, and cottons; patchwork on sleeves, skirts and vests; contrasting pockets; rickrack and trims; and a quilt made into a jacket. The slide presentation was supplemented with additional teacher ideas and examples of children's clothing which incorporated different trims, appliques and buttons.

Thereafter, each class was divided into five groups to experiment for forty minutes with various materials to gain experience in originality and elaboration. To enhance the establishment of effective work relationships, the groups were comprised of students sitting in close proximity to each other. The groups were instructed to create different uses for the materials and to share their ideas and examples with the class. While one group worked with string, cording, rickrack braid, and ribbon a second group experimented with patches, shapes, appliques, quilting, and



trapunto. A third group used felt tip pens, rubber stamps, stenciling with acrylic or embroidery paints; and the fourth group worked with trims, nail heads, buttons, and fancy snaps. The fifth group experimented with stitches for tasks such as smocking, embroidery, quilting and machine decorative stitching.

The skill level of some students restricted their ability to complete the suggested tasks. Assistance was provided by teaching needed skills to complete such tasks as embroidery stitching, smocking, and measurement of trim. The students willingly taught each other the newly acquired skills, and the ideas generated by each group were shared with the other groups. Examples of the students' work were mounted on the bulletin board until the next class meeting.

An exercise called Magic Squares followed, which was designed to help the students individually develop flexibility and originality in their ideas. The students listed different garments down the side of a chart, and different trims and design ideas along the top of the chart (Appendix D). A large example was drawn on the chalk board and each person had fifteen minutes to complete the chart. Each student was requested to select her three best ideas and share one idea with the class.

Additional experiences in originality and elaboration were gained through redesigning five out-dated garments displayed in the classroom. The garments included a brown

camel-hair princess-line coat with a round collar; a shocking pink, sleeveless, A-line dress; a spaghetti-strap, white seersucker sundress with a fifteen-inch embroidered band of large flowers; a white silk, sleeveless dress with a waistline and straight skirt; and a short, red, pleated skirt with a long, red vest having silver buttons down the front.

The students were divided into pairs and compiled ideas for redesigning or using each garment. Each pair consisted of students sitting adjacent to each other. The students had many ideas for redesigning or recycling the garments; for example, adding ruffles and collars, shortening the vest, and discarding the pleated skirt or giving it to a little sister.

The final learning activity required a line drawing to be completed and given a title. The students generated numerous methods of completing the drawings as experience was gained in the creative areas of elaboration and originality.

During the lesson presentation the classroom teachers were not present. However, the different personalities of the teachers and the climate each had established in the classroom could not be controlled. Since it was spring term, the interpersonal relationship between class and teacher was well established.

## Administration of Measures

### Tests of Creative Ability

Before administering the test, special arrangements were made with the school district administration office, each high school principal and the classroom teachers. The pretests of creative ability were administered to all five classes on three consecutive days. All tests were administered by the investigator based on the test booklet instruction, and each test required fifteen to twenty minutes for administration. Each classroom teacher assisted in giving the test to insure a conducive student testing environment with all necessary testing materials. Both "Match Problems" and "Decoration" were given the same day with a five-minute break between tests. "Decoration" was administered first and each test collected immediately after completion. The same procedure was repeated for the post tests five and one-half weeks later.

### Selection of a Panel

A panel of five home economists, including the researcher, were selected to rate the finished garments from all the experimental and control classes.

Each rater was selected based on her familiarity with the subject matter and willingness to participate in the evaluation of the garments. Each home economist had

previously taught in a public school. At the time of the research project, the panelists included a part-time junior high teacher, a part-time employee of the Pellon Corporation, a part-time Portland Community College teacher, a full-time homemaker and the investigator. Because the panel's judgment was limited to a quantitative evaluation, no other special characteristics were deemed essential for participation on the panel.

#### Evaluation of Finished Garment

The evaluation of finished garments was designed to measure the creative production of the students, in both the experimental and the control groups. The first rating device developed proved too complex due to many detailed scoring columns. Therefore, consistent evaluation was difficult. The rating device was redesigned to avoid the problems. The fifteen garments used in validating the scoring device were not included in the research study.

The investigator developed a scoring method using guidelines from "Decoration" and sections of Torrance's Test of Creative Thinking. Student garments received one point for each idea exhibited which was different from the picture on the pattern envelope. Changes could be made in fabric, color, design lines, trims, decorative effects, pockets, embroidery and stenciling. The points were tallied for a final score.

The panel was initially instructed on rating the garments using the creative Clothing Evaluation Form (Appendix E). The garments were numbered and displayed with the pattern envelope, or picture from the pattern book if the student had failed to include the envelope. All judges individually rated each garment before evaluation of the next garment. A second meeting was required to complete the garment evaluation.

The five rater's scores for each student's garment were averaged to arrive at a creative product score. A comparison of the judges' scores on each garment demonstrated a high level of agreement among judges. Reliability of the clothing evaluation form was demonstrated by the agreement in judge's scores.

#### IV. RESULTS

Analysis of results was based on a three-step process. The test results, Match Problem and Decorations, were evaluated; the garment scores were independently evaluated; and then the tests and garment scores were statistically compared.

##### Tests of Creative Ability

The first step in analyzing the test results was to compare the experimental (N = 22) and control groups (N = 24) using the means of pretests and post tests and the standard deviations as shown in Table 1.

A t-value, the comparison of two means, was calculated for the experimental and control groups for each test: "Match Problems" (on a combined pretest and post test basis) and "Decorations" (on a combined pretest and post test basis). The t-value of two or more would indicate a significant relationship.

The control group scored higher than the experimental group on the Match Problems test with a mean score of -1.769 to -.727 and also scored higher on the Decoration test with a mean score of 10.8821 vs. 10.000. The differences for both tests were not significant. The raw data for the range of individual scores on the creative tests is included in Appendix F.

Table 1. Comparison of Mean and Standard Deviation Between the Experimental and Control Groups on Two Tests for Creative Ability.

	Mean		Std. Deviation		t-value
	Exper.	Control	Exper.	Control	
Match Prob.	-.727	-1.769	3.480	4.107	0.934
Decorations	10.000	10.882	8.903	10.956	0.302

df = 44

t.05 = 2.0

### Creative Product Results

A comparison of the mean and standard deviation for the experimental and control groups on creative product scores is shown in Table 2.

Table 2. Comparison of Mean and Standard Deviation Between the Experimental and Control Groups on Creative Product Score.

Mean		Standard Deviation	
Exper.	Control	Exper.	Control.
2.173	2.208	1.851	0.937

N = 46

The means of the creative product score for the experimental and control groups were approximately equal; however, the standard deviation for the experimental group (1.857) was twice that of the control group (.937).

The comparison of the five classes on the creative ability test, using mean and standard deviation; and creative product, using mean and standard deviation, is shown

Table 3. Group Mean and Standard Deviation for the Creative Ability Tests and Creative Product Scores.

	I Pre (MP)	II Pre Test (DEC)	I Post Test (MP)	II Post Test (DEC)	Garments	Number	
Experimental I							
Mean	10.11	34.78	10.89	44.33	3.13	9	6 dropped
Standard D.	3.69	9.08	5.06	13.94	2.42		
Experimental II							
Mean	13.77	46.85	14.46	58.54	1.55	13	2 dropped
Standard D.	4.59	8.54	5.47	10.59	1.14	<u>22</u>	
Control I							
Mean	10.00	46.50	14.00	47.50	2.25	4	3 dropped
Standard D.	3.56	9.11	3.46	12.40	.91		
Control II							
Mean	12.11	50.22	12.9	67.30	2.0	10	9 dropped
Standard D.	3.82	11.87	3.8	18.5	1.0		
Control III							
Mean	10.50	41.83	12.4	52.22	2.4	12	12 dropped
Standard D.	3.7	10.7	4.5	11.7	1.0	<u>26</u>	



in Table 3. All classes exhibited a gain in creative ability scores between the pretests and post tests.

A comparison of the means and standard deviations of the five groups for just the creative product score (garments) is shown in Table 4. The three control classes were approximately equal with means of 2.25, 2.0, and 2.4 and standard deviations of .91, 1.0 and 1.0 respectively.

The scores might indicate all progressed relatively evenly with little range of creative scores within the classes. Experimental group I exhibited a mean of 3.13 with a standard deviation of 2.42, whereas experimental group II had a mean of 1.55 and a standard deviation of 1.14.

A higher standard deviation indicates a broader range of creative scores in the class and a higher mean indicates larger raw creative scores in the class. In both cases a high mean and a high standard deviation indicated the group exhibited a broad range between the high and low score in creativity, and less adherence to the group norm.

Table 4. Comparison of Means and Standard Deviations the Five Groups on the Creative Product.

Groups	Mean	Standard Deviation
Experimental I	3.13	2.42
Experimental II	1.55	1.14
Control I	2.25	.91
Control II	2.0	1.0
Control III	2.4	1.0

### Correlations

The Pearson Product Moment Correlation Coefficient was used to test the relationship between the creative product scores and the creative ability of the students as measured by the different creative ability tests (Decorations and Match Problems). A significant relationship was indicated by the F-value. For the total population a low correlation existed between the tests of creative ability and the creative product scores as shown in Table 5. None of the tests were found to be significant.

Table 5. Comparison of Class Creative Ability Test Scores and Class Creative Product Scores.

Tests	Std. Dev.	F-value
Pretests		
Match Problems	-0.101	-0.46
Decorations	-0.248	2.87
Post tests		
Match Problems	-0.149	1.01
Decorations	-0.150	1.02

N = 46  
df = 44  
F<sub>.05</sub> = 4.08

### Regression Analysis

A multiple regression analysis was used to determine if any tests of creative ability were good predictors of creative production in the finished garments. The following

equation was used:

$$\begin{array}{l} \text{garment} \\ \text{rating} \end{array} \quad Y = \beta^{\circ} + \beta_1 \hat{X}_1 + \beta_2 \hat{X}_2 + \beta_3 \hat{X}_3 + \beta_4 \hat{X}_4$$

Pretests                      Post tests

The equation used all the information from the pretests and post tests to determine if any of the tests were good predictors of the garment creative production scores.  $\beta^{\circ}$  was a constant 3.190.

The t-value indicates how close the regression coefficient is to zero. In this study the t-value must be approximately two to indicate that a test would be a good predictor of garment creativity. A multiple regression analysis assumes the distribution of error will be the same for all tests. A standard error of estimate must be calculated. All the tests of creative ability were poor predictors of creative production scores, as indicated in Table 6. None of the t-values exceeded 2.0. The total of the entire sample was used in determining the predictability of the pretests and post tests.

Table 6. Comparison of Creative Production Scores with Creative Test Scores as Predictors of Creative Production.

Independent Variable	Regression Coefficient	t-value
I Pretest	.086	-1.26
II Pretest	.041	-1.37
I Post test	.106	1.84
II Post Test	.0083	.40

N = 46  
 $t_{.05} = 2.0$

$df_1 = 1$   
 $df_2 = 41$

Dr. Wayne Newberger, Coordinator of Program Planning and Evaluation of the Beaverton School District, supervised the statistical analysis and its interpretation. The Beaverton School District made computer service available for the study.

## V. CONCLUSION AND DISCUSSION

The following conclusions have been derived for the null hypothesis regarding the relationship between introductory lessons on creativity and the creativity exhibited in students' finished clothing construction projects.

H<sub>0</sub>1. There is no relationship between creative ability of the student and the creative production of the clothing item constructed by the student.

The null hypothesis cannot be rejected. Neither test was determined to be a good indicator of creative production, as a low correlation existed. Creative production did not increase in the scores on the tests.

H<sub>0</sub>2. There is no relationship between the presentation of lessons designed to emphasize creativity and the creative production exhibited in the finished student's garment.

The null hypothesis cannot be rejected. The mean of the garment scores for the experimental group (2.173) was approximately equal to the mean of the control group (2.208). However, the standard deviation for the experimental group (1.85) was twice as great as the standard deviation for the control group (.937). The variance in the experimental groups might indicate that some of the students

demonstrated greater creativity and less adherence to group norms than the control group. Visually, ideas from the lessons presented were definitely evident in one experimental class. Experimental Group I also exhibited a wider range of creative ideas.

H<sub>0</sub>3. There is no relationship between teacher assistance and student creative production, as evidenced in the finished garment.

Insufficient data was collected using the Checklist of Classroom Instruction to make any determination of this hypothesis. After five days one teacher discontinued recording assistance given to students. Therefore this hypothesis can neither be accepted nor rejected.

The study was based on the use of creative ability tests, a Creative Product Evaluation Form, and teaching lessons. Variables among the groups were the students, the teachers and the classroom environment. Several explanations of the data might be made.

The non-verbal tests measure originality and elaboration which are two of the areas involved in creative effort. Experience gained in using the tests indicated that there was an explanation for the consistency between the control and experimental classes for the pretest and post test results. The students were not directly instructed as to the concepts measured by the tests. There were five weeks

between the lessons on creativity and the post tests. The lessons would have had a negligible influence on any student's performance on the test of creative ability. Perhaps the tests of creative ability should have been administered earlier in the research if the influence of the lessons was to be measured.

No standardized criteria for judging a creative clothing product were found; therefore a measure had to be developed. The Creative Clothing Evaluation Form could have had an effect in rating the garments. Visually in several cases, evidence of creative production was not revealed by the score. A second score on elaboration would have added more dimension. A different system of calculating creative production scores might also influence the score. Such a system might calculate the duration of an individual score from the mean of the group.

The control and experimental groups of students were not equal in sample size because a large number of students were dropped from the sample for absenteeism. While the schools reported that the classes were not grouped by ability, indirect grouping may have resulted from other class scheduling. The possibility is not excluded because creativity increases with IQ up to 120; therefore ability grouping could have affected the results.

The two experimental classes exhibited differences in their creative production. Experimental group I's creative

product score was 3.13, indicating higher number of changes, whereas experimental group II's creative product score was 2.55 (Table 4). The results are consistent with the investigator's visual evaluation of the two experimental classes. Experimental group I had used more decorative detail, more individually designed garments, and less expensive fabric or previously used fabric. Examples of creativity in the Experimental group I consisted of remaking old garments; using trims and embroider; designing and constructing patterns; decorating with felt tip pens and rubber stamps; and changing fabric type and color from pattern envelope.

Experimental group II had more expensive fabrics, commercial trims and better construction detail. Examples of creativity in experimental group II consisted of changing fabric type and color from the pattern envelope illustration, using commercial trims, and using a border print design. The differences in the two groups might be attributed to the differences in the teachers' values on creativity and the emphasis on construction techniques during the research project.

The environment created by the teachers apparently was more influential on the creative production than the initial creative ability as measured by the tests or the influence of the introductory lessons. The teachers were excluded from the introductory lessons to prevent contamination of the control classes. Because the teachers' techniques were



not influenced by the presentation, their usual teaching methods could either enhance or restrict the value of the introductory classes. For purposes of the study, it is possible that participation by the teachers in the introductory lessons would have enhanced the continuing value of the introductory lessons. Such teacher participation, however, would require closer monitoring of the control classes to prevent contamination.

## VI. SUMMARY AND RECOMMENDATIONS

### Summary

Creative ability and introductory lessons on creativity were each studied as related to the creativity displayed in students' finished clothing projects.

The participants in this study were intermediate level clothing construction students in three high schools in Beaverton, Oregon. The sample consisted of twenty-two students in the experimental group and twenty-six students in the control group.

In order to test the hypotheses, the control and experimental groups were given two tests relating to the creative abilities of originality and elaboration. The experimental groups participated in lessons taught by the investigator. The lessons were designed to give experiences in creative ideas applicable to clothing construction and included slides, brainstorming, participation in group work using a variety of materials, a matrix chart from which to create trim and design ideas for garments, the redesign of five old garments, and a free line drawing. When the students' garments were finished five weeks later, the groups were retested (using the previously described tests of creativity). The garments of both the control and experimental groups were rated by a five member panel on the quantity of

creative production evident in the garments. There was no standardized form available for evaluation; therefore, an evaluation form was developed.

Statistical analysis included the Pearson Product Moment Correlation Coefficient to study the relationship between the garments and the test of creative ability. A regression analysis was used to determine if any of the tests were good predictors of creative production as evidenced in the garments. The mean of the garment scores and the test scores were used to calculate the t-values. The standard deviation showed the range of scores in the groups.

The first hypothesis cannot be rejected because no statistically significant differences were found between the creative ability of students and their creative production with the clothing item constructed. The environment, tests of creative ability, sample size, or the clothing rating device, may have influenced the lack of significant results.

The second hypothesis cannot be rejected because no statistically significant relationship was found between the presented lessons and the creative production. In one experimental class, it was observed that many ideas stimulated by the lessons were incorporated in the garments.

The third hypothesis cannot be either accepted or rejected because of insufficient data collected on the teachers' assistance as it may have influenced student creative production.

In conclusion, the results suggest that creative lessons could affect increased creativity for some students. The Creative Clothing Evaluation Form has potential for providing a means for students to self-evaluate their creative efforts. Adding a quality rating to the device would enhance its value but make garment evaluation more subjective.

### Recommendations

A research project is a learning tool which often generates more questions than it answers. As with any learning experience, reviewing and evaluating the information learned are important steps. The knowledge gained in this study may be useful in achieving a greater understanding that significant responsibility is placed on the teacher to establish an environment which encourages creative production. Stimulation of student creativity is difficult unless nurtured by the teacher throughout the duration of the class.

The lesson plans used in this study provided ideas for teachers to offer experiences in creativity in clothing construction. Classes in clothing construction provide a good opportunity and medium through which to develop students' creative potential.

The students' basic ability as rated by the tests was apparently not as critical in creative production as the

environment. The environment created by the teachers apparently was more influential than the introductory lessons on creativity.

#### Recommendations for Improvement of the Study

Several recommendations can be made for improving the study. Better control of classroom daily activities would have facilitated the research. This might have been accomplished by having the teachers stress creative production in the experimental classes or by having the investigator visit the classroom regularly. Such visitation would have provided concrete data on the environment and would also have reminded the teacher to stimulate creativity.

Calculations for the creative product score might have utilized a different system, such as computing the deviation of an individual score from the mean score of the group.

Student performance might have been different if this research had been carried out at a time other than May, as the classroom environment was well established and absenteeism was high.

### Recommendations for Further Study

Everyone has creative ability; it only needs to be activated. Therefore creativity is an exciting area for study, with many possible teaching opportunities.

Recommendations for further study can be divided into three categories: (1) research related to the learning or teaching of creative activities; (2) the teacher; and (3) improving measurements of creative production. Further research might study methods of teaching creative skills. For example, one-to-one teaching could be compared with small or large group instruction using both visual presentations and samples of creativity.

Research investigating the role of teacher assistance on student creative production would be helpful to the teacher for daily classroom activity. Further study involving the teacher's creative activities or ability as compared to student creative production might be of interest to administrators and teachers attempting to enhance creative production in students.

A limited reliability check of the evaluation form was made for the present study. Further investigation should be conducted to improve the Creative Clothing Evaluation Form. The evaluation device could be used as a measure for rating student creativity on an upgraded basis.

The Creative Clothing Evaluation Form could be expanded to score both quality and quantity of creative production, as certain aspects of creative production were underrated in the form used in this study. For example, a second score on elaboration would contribute more information. Elaboration might have been rated on a scale from 0 to 5 so that a student who, for example, designed and embroidered a train with detail would get five points, while a change in color from the suggestions on the pattern envelope would receive zero points. In such a study the selection of judges might be crucial, since accurate measure of quality in addition to quantity would be involved. Further, requiring each student to submit a list of changes differing from the pattern envelope would guarantee that no changes were overlooked.

Although influenced by class duration, composition and subject matter, the evaluation of students' garments prior to stimulating creativity through lessons could be considered as another indicator of change induced by the introduction of creativity. Group product scores for the pre-stimulus garments would then be compared with garments completed after class emphasis on creativity.

If a reliable Creative Clothing Evaluation Form could be developed, one might test the relative effectiveness of general lessons (as reported by Osborne) and the specific

lessons used in the project on creative production in clothing construction.

Further research could investigate the relationship between the differences in creative production by comparing creative ability, general motivation, motivation of the specific project, the background of related experiences, time for creative work, classroom atmosphere, and IQ.



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## APPENDICES

APPENDIX A

OUTLINE FOR TEACHER WORKSHOP

## OUTLINE FOR TEACHER WORKSHOP

### 1. Explanation of Research Project - Goals and Hypothesis

#### A. Blocks to Creativity:

Everything done must be useful.  
 Everything done must be successful.  
 Results should be perfect.  
 Preference for activities in cooperation with other people.  
 No excessive emotional feeling.  
 No ambiguity or intellectual playfulness.  
 The cultural boat should not be rocked.  
 Reliance on an authority, i.e., books, teachers, friends.

#### B. Ways to Encourage Creativity:

Give recognition to those trying new ideas.  
 Encourage everyone to experiment.  
 Have working materials in hand or have available money for purchase.  
 Develop self-confidence through development of skills.  
 Give credit and praise whenever possible.  
 Assign original work.  
 Discourage conformity. How will you make it different?  
 Have a resource file for yourself and class.  
 Respect the unusual.  
 Recognize and encourage freedom of exploration.  
 Help students to be independent and have courage to share new ideas.  
 Respect each other's ideas.  
 Provide a classroom rich in experiences, permissiveness, security and encouragement and freedom from threats.

### 2. Control Class:

Do not change your usual teaching method.

### 3. Order of Activities for Projects:

Administration of creative ability pretest to experimental and control group.  
 Instruction of lessons on creativity by investigation to experimental groups.



Five weeks for garment construction.  
Administration of creative ability post test to  
control and experimental groups  
Rating of garments

4. Teacher Checklist for Classroom Instruction.
5. Rating all Garments from Control and Experimental Classes.
6. Other Questions?

APPENDIX B

CHECKLIST FOR CLASSROOM INSTRUCTION

Class \_\_\_\_\_  
 Period \_\_\_\_\_  
 Date \_\_\_\_\_

## CHECKLIST FOR CLASSROOM INSTRUCTION

Check quickly if and how you assisted each student during the class period.

Student's Name	Made a specific suggestion	Made more than one suggested alternative	Helped student clarify an idea	Taught a construction technique	Gave no assistance	Specific Situation
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						

Were any specific methods used? Please list or identify.

APPENDIX C  
OUTLINE OF TEACHING LESSONS

## LESSON PLANS - DAY 1

Goal: The students will complete the standardized test on creativity and the questionnaire. The students will develop an understanding of goal on creativity.

45 min. Administer the (DEC) and (MP) Tests of Creative Thinking. Follow directions given in teacher's manuals for the (DEC) and (MP) tests.

5-10 min. Explain the purpose of the tests and plan for the next two days. Answer questions concerning the research project.

## LESSON PLAN - DAY II

Goal: The students will apply the concepts of creative fluency and flexibility in developing a variety of different ideas related to creative clothing production.

<u>Time</u>	<u>Activity</u>
5 min.	Read: "What is Creativity?"
10 min.	Brainstorn the different ways one can be creative. Record ideas on blackboard.

Ways to be Creative

snaps	old buttons sewn in a pattern
eyelets	felt tip markers
grommets	embroidery paints
velcro tape	block printing - rubber stamps
fancy hooks & eyes	stencilling - acrylic paint
novelty buttons & buckles	several brushes
iron-on patches	applique
use of zippers	patchwork
fancy embroidery	quilting
novelty trims	trapunto
ribbons	match embroidery
pattern change	add pockets
10 min.	Slides showing creative ideas as applied to clothing. Supplement with garments.
40 min.	Divide the class into five groups. Each group is given slip of paper and corresponding supplies to demonstrate as many ways as they can to use the materials on garments.
	1. String, cording, rickrack, braid, ribbon

2. Variety of fabrics - patches shapes, appliques, quilting, trapunto
3. Decorate fabrics - fabric paint on dye, rubber stamp, embroidery paints, felt tip pen
4. Uses for beads, buttons, trims, nail heads, sequins, snaps
5. Stitching - smocking, embroidery, quilting, machine decorative stitching.

5 min.

Have each group share and demonstrate its ideas to the class.

Display results on bulleting boards.

15 min.

Have the class do Magic Squares for dress design.

Share ideas orally.

## LESSON PLAN - DAY III

Goal: The student will apply the concepts of originality and creative elaboration (that of working out the details of an idea) to garment creative production.

<u>Time</u>	<u>Activity</u>
30 min.	<p>Display five old garments. Each student write down or draw methods to make each garment currently fashionable.</p> <p>Randomly request the students to share ideas.</p> <p>"By everyone adding her ideas we probably have a more workable plan for each garment than many of us had imagined."</p>
10 min.	<p>Each student will complete the free line drawing, "Let your imagination go."</p>



APPENDIX D  
TEACHING AIDS AND EXERCISES

Tape on cassette for easy use in the classroom.

### What is Creativity?

We all assume that artists and musicians are creative people, but had you thought of creative carpenters, lawyers, teachers, secretaries or parents? Each vocation has its creative possibilities. Without creative individuals, the school or the company would cease to move ahead and grow.

What is creativity? Creativity usually means combining, relating and reorganizing materials and ideas in different ways to achieve something different. It usually involves invention, discovery, curiosity, experimentation, originality and imagination. Most things in the world can be improved on with new and different ideas. Creativity is using your talent. It's doing your own thing.

It is important that you develop your creativity! Why, you ask? The answer lies in two questions:

1. Would you like to feel better about yourself?
2. Would you like to feel more important?

The need to grow and create is basic in each individual. The results of not using your potentialities, your abilities, and your talents might be unhappiness, frustration or lack of meaning for your life.

Thinking up new ideas is deliberate and systematic. A majority of times a good idea is found only after many

inadequate ones have been considered. A creative person is not an undisciplined thinker. There are several guidelines to help you.

1. be motivated -- it takes work to think up ideas or answers.
2. be enthusiastic about your ideas -- the best ideas are not always easily accepted by others.
3. have "stickability" -- don't quit or give up too soon.
4. maintain a questioning, curious attitude -- you never know where an idea will come from.
5. keep exercising your mind. Your brain needs exercise just like your muscles. It takes self-discipline.
6. keep an open mind so ideas won't be blocked.

Creative living starts now! To begin to develop a creative attitude ask this question honestly -- Do you have the capacity to be puzzled. Are you industrious? Do you let yourself get excited or enthusiastic? In other words, are you alive?

Life should be adventure. It should be exciting, not boring. The imaginative, searching attitude will not only make you a creative person, but will make life exciting as you seek problems that need answering.

Directions for the Five Groups to Use in Experiencing Different Ways of Being Creative in Clothing

Group I

Take out your sewing supplies. Now look at the materials you have been given. What creative uses can you think of? Now do several different things with the materials. Find scraps in the scrap boxes. Have fun!

Demonstrate decorative uses for: string, cording, rickrack, braid, ribbon.

Group II

Demonstrate: patches, shapes, appliques, quilting, trapunto.

Group III

Decorate fabric: felt tip pens, rubber stamps, stenciling with acrylic paints, and brushes, embroidery paints.

Group IV

Use beads, trims, nail heads, buttons, snaps.

Group V

Use of stitching such as smocking, embroidery, quilting, machine decorative stitching.

### MAGIC SQUARES

You are a dress designer for the young market and would like to develop a new fashion look that would be appealing to that age group, and make you lots of \$\$\$\$. Make a checkerboard with different types of garments such as slacks, blouses, dresses on one side and different trims and design ideas along the top.

#### Trim and Design Ideas

Types of Garments	Trim and Design Ideas									

Types of Garments

Trim and Design Ideas

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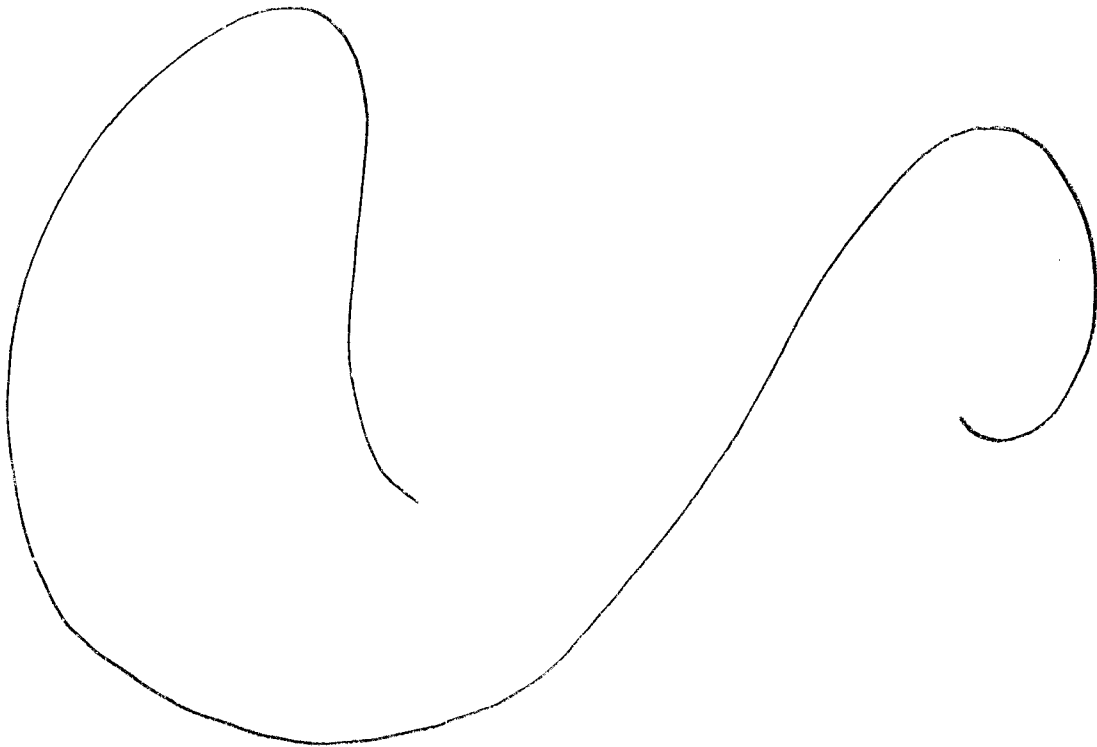
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## LET YOUR IMAGINATION GO

Finish this drawing and give it a title. Complete this figure in such a way as to make an interesting picture. Add details to make it tell an interesting story.



Title: \_\_\_\_\_

Source: (Gade, 1974, p. 3-s)

APPENDIX E  
CREATIVE CLOTHING EVALUATION FORM

Name \_\_\_\_\_

## CREATIVE CLOTHING EVALUATION FORM

Directions: Each idea incorporated in the garment which is different from the suggestions on the pattern envelope receives one (1) point. This would include a change in color, fabric, design lines, trims, decorative effects, adding pockets, embroidery, and stenciling.

Garment Number	Scoring
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	



APPENDIX F

RAW SCORES OF CONTROL AND EXPERIMENTAL GROUPS

## EXPERIMENTAL CLASS I

Student Number	I Pretest	II Pretest	I Post test	II Post test	Garment
1.*	10	50			
2.	4	42	6	52	2.6
3.*	13	39	13	39	3.2
4.	7	28	9	40	2.4
5.	13	41	10	40	1.4
6.	7	43	6	53	1.4
7.*		53			1
8.	12	45	12	30	2.2
9.*	15	33			
10.	12	42	5	73	3.4
11.	16	42	20	48	4.4
12.*	8	21			2.2
13.	9	19	15	34	9
14.*	8	48			3
15.*					
16.	11	29	15	29	1.4

\* Dropped

## EXPERIMENTAL CLASS II

Student Number	I Pretest	II Pretest	I Post test	II Post test	Garment
1.	24	52	22	68	1
2.	15	37	13	46	1
3.	20	41	23	58	1
4.	14	55	15	72	3
5.*	4	39			0
6.	12	43	10	57	3
7.	10	33	14	39	2.6
8.*	9	34			2.8
9.	13	46	12	66	0
10.	10	59	18	62	1.4
11.	17	45	21	52	3
12.*					3
13.	9	59	5	67	.6
14.	10	38	8	43	0
15.	16	55	16	68	1
16.	9	46	11	63	2

\*Dropped

Pretest I and Post-test I = Match problems

Pretest II and Post-test II = Decorations

## CONTROL CLASS I

Student Number	I Pretest	II Pretest	I Post test	II Post test	Garment
1.	9	45			
2.	13	49	15	59	1.2
3.	5	42	9	49	2
4.*	0				
5.*	0	20	1	26	
6.	12	37	15	30	2.4
7.	10	58	17	52	3.4
8.*	18	55			
9.*	13	31			2

\*Dropped

## CONTROL CLASS II

Student Number	I Pretest	II Pretest	I Post test	II Post test	Garment
1.	18	56	16	52	1.4
2.*	15	56			
3.	11	58	19	70	3.6
4.	8	45	14	72	2
5.	10	40	12	53	1.2
6.*	13	27			
7.*	7	59			
8.*	4	24			
9.	12	43	15	51	2
10.	10	44	8	49	1
11.*	12	37			
12.*	15	56			1.2
13.*	18	42			3
14.	18	73	14	95	2.6
15.	9	41	9	45	
16.*	15	61			
17.	14	58	11	99	1
18.	8	35	7	55	3.2
19.*	10	53	10	53	

\*Dropped

## CONTROL III

Student Number	I Pretest	II Pretest	I Post test	II Post test	Garment
1.	14	19	8	25	2
2.*	17	59	14	64	
3.	10	31	16	46	1
4.	15	56	10	44	2
5.	9	35	9	44	4
6.	15	45	14	57	4
7.	7	49	7	50	1
8.	17	49	21	69	3
9.	7	31	14	52	2
10.	10	42	15	56	2
11.*	6	61		69	
12.	7	53	16	65	3
13.	7	46	6	59	2
14.*	2	57		61	
15.	8	46	13	59	0
16.*	19	45			
17.*	5	24	6		
18.*	6	36	7		
19.*	14	52			
20.*	7	50			1
21.*	10	36			
22.*	14	52			5
23.*	9	35			
24.*	8	38			

\*Dropped