AN INVESTIGATION OF THE USE OF AUDIO-VISUAL MATERIAL AS A TEACHING METHOD TO PROMOTE CREATIVE THINKING IN GIFTED JUNIOR HIGH STUDENTS

A Thesis
Presented to
The Graduate Faculty
California State College, Hayward

In Partial Fulfillment
of the Requirements for the Degree
Master of Science in Education

by
Jacquelyn M. Allen
February, 1972
AN INVESTIGATION OF THE USE OF AUDIO-VISUAL MATERIAL
AS A TEACHING METHOD TO PROMOTE CREATIVE THINKING
IN GIFTED JUNIOR HIGH STUDENTS

By
Jacquelyn M. Allen

Approved:          Date:
Phyllis Kaplan, Ph.D.  2-16-72
Steve E. Hopkins  16 Feb 1972

Committee in Charge
# TABLE OF CONTENTS

| ACKNOWLEDGEMENTS | ........................................................ | v |
| LIST OF TABLES | ...................................................... | vi |
| LIST OF FIGURES | .................................................... | vii |
| ABSTRACT | ......................................................... | viii |

## Chapter

### I. INTRODUCTION

- Historical Development of the Gifted Movement | 1
- The Significance of the Problem | 4
- The Problem | 5
- Definitions | 5

### II. REVIEW OF THE LITERATURE

- The Characteristics, Needs, and Educational Goals For The Gifted | 7
- Giftedness Versus Creativity | 13
- Creativity: Its Characteristics, Nurture, and Educational Ramifications | 15
- Creativity and Instructional Media | 23
- Conclusion | 25

### III. DESIGN AND PROCEDURE

- Specific Statement of the Problem | 27
- General Methodology | 27
- Research Design | 28
  - Definitions | 28
  - Research Sample | 30
  - Procedures | 31
- Statistical Procedures and Hypotheses | 33
- The Measuring Instrument | 36

### IV. RESULTS

- Experimental Analysis | 39
  - Hypothesis One | 39
  - Hypothesis Two | 41
  - Hypothesis Three | 41
  - Hypothesis Four | 41
ACKNOWLEDGEMENTS

I would like to express my appreciation to the two teachers and counselor who assisted me as judges in this study and to the principal of the intermediate school where I ran my study for permission to carry out this project.

My thanks also goes to Dr. Whalen whose assistance in setting up my research design and technical help to master the statistical manipulations necessary for this thesis was invaluable.

Lastly I would like to sincerely thank Dr. Kaplan, my thesis advisor, for her inspiration and encouragement in every step of my thesis preparation. And my thanks goes to Dr. Crapo, my reader, for his help in the final preparation of my thesis.
LIST OF TABLES

Table                                           Page

1. Summary Table of Analysis of Variance.       40
2. A Comparison of the Mean Scores For All Students
   Between Experimental and Control Groups.     42
3. A Comparison of the Mean Scores for Creativity
   Between Gifted and Nongifted Students.       43
4. A Comparison of the Mean Scores Between
   Experimental and Control Groups on a Basis
   of Giftedness.                               44
5. A Comparison of the Mean Scores Between
   Experimental and Control Groups on the Basis
   of Sex.                                      45
6. A Comparison of the Mean Scores For a Differential
   Effect on Creativity Between Gifted and Nongifted,
   Male and Female Students.                    47
7. A Comparison of the Mean Scores Between Gifted
   Experimental and Gifted Control in Terms of Sex. 48
8. A Comparison of the Mean Scores Between Nongifted
   Experimental and Nongifted Control in Terms of
   Sex.                                         50
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Experimental Design</td>
<td>34</td>
</tr>
</tbody>
</table>
ABSTRACT

It was the purpose of this study to investigate the use of a sound filmstrip and accompanying discussion as a teaching method to promote creative thinking in gifted junior high students.

Two major groups were used for the experiment. The Control Group did not see the sound filmstrip and was merely given the essay assignment, the measuring instrument of creative thinking. The Experimental Group was shown the sound filmstrip- "Values For Teenagers: The Choice Is Yours," followed by a short discussion on some relevant questions, and then was given the task of writing an essay on "Freedom of Choice." Each group contained 20 students; an equal number of gifted and nongifted students and also an equal distribution by sex in each level of giftedness.

A Pilot Study was run using an average, regular 8th grade English class. The three judges used these essays to determine the criterion of creativity; then they applied the criterion to the Control and Experimental group essays and gave each one a creativity score.

A three-way factorial analysis of variance was used on the groups to determine whether there were significant differences between them. Significance was set at the .05 level.

This study showed that the audio-visual method employed
to stimulate creative thinking in gifted junior high students was inadequate in facilitating such creative thinking in the sample group. The Control Group scored as well in creative thinking as the Experimental Group which was purposefully stimulated toward a creative product. It also pointed out that nongifted students have as great a potential, if not greater, for creative thinking as gifted students.

Although female students, especially in the Control Group, scored somewhat higher than males there does not seem to be a real sexual difference in creativity scores. Males and females have similar creative potential.

Creativity remains difficult to measure and perhaps future research will refine creativity measurement to the point that concrete knowledge may be gained by studies such as this one. Such a discovery will be a great contribution to mankind.
CHAPTER I
INTRODUCTION

Historical Development of the Gifted Movement

Interest in the intellectually gifted child is a relatively new development in the annals of educational history. Terman (1925) believes that Galton's Hereditary Genius, published in 1869, marked the inception of an era of strong interest in individual differences. There is also record of a multiple track system developed in Elizabeth, New Jersey, in 1866. This system permitted the bright and gifted pupil to advance more rapidly than the average pupil.

With the beginning of the twentieth century a real awareness of the need for special provisions for the education of the intellectually gifted child became evident, and a variety of experimental programs developed. In the early 1900's several school systems made rather extensive provisions for differences in pupil ability. Pupils were placed in groups on a basis of test results in Santa Barbara, California. Special classes for gifted pupils were formed throughout the United States: in Los Angeles, California; Cleveland, Ohio; and Rochester, New York.

From 1920 to 1930 provisions for the gifted consisted of acceleration or enrichment or by a combination of these practices. Edna Lamson (1930) in reviewing a vast body of scientific studies concerning the nature and needs of gifted children suggested four stages of development of this know-
ledge. Steps three and four specifically pertain to this study:

3. Experimenting with special classes and other methods designed to offer suitable opportunities for the gifted.

4. Making follow-up studies, including experimental studies in curriculum development at the high school and college level.

Interest and actual programs were diminished for almost twenty years until a renewed effort manifest itself in the late 1940's and early 1950's. This appeared to be the stage of rapid dissemination of knowledge about gifted children and of a renewed effort to offer gifted and talented children more adequate educational opportunities.

An editorial committee of the Association for Gifted Children after several months of study, drew up a list of essential topics to be included in their up and coming 1950 volume. The ninth topic was an annotated bibliography of investigations and reports dealing with gifted children and youth. This study hopes to add to such a bibliography by investigation of the use of audio-visual material in promoting creative thinking in gifted junior high students.

Educational provisions for gifted children to date can be categorized into five principal methods. First, the laissez-faire method in which children remain in the regular grades appropriate to their ages with only such attention to their intellectual needs as the individual teacher may provide.
This method has not proven too successful unless the class is small, and the teacher has special training.

The second method is acceleration. The student moves at an accelerated rate of progress through the grades by means of extra promotion but without any change or enrichment of the regular curriculum. In such cases double promotions have been employed more than any other method of providing for giftedness. Often this method greatly handicaps the bright child in social relationships.

Some enrichment of curriculum while children remain in regular classes is the third method. There are several ways of carrying out this method. The child may stay in the classroom doing supervised projects or be dismissed for certain periods of time to receive special instruction in foreign languages, music, etc.

There is a fourth method of segregating the most able children into special classes where they are given specialized instruction. This method has many advantages: it simplifies the problem of providing an enriched curriculum; it provides for acceleration without skipping grades; it gives the student intellectual competition from peers; and it gives him social advantages with classmates of similar interests. On the other hand such classes may be distinguished from regular classes to the point that name calling takes place and a stigma is attached to their attendance. The first class of this type was established in Cleveland, Ohio in
1921 and was known as "Major Work Classes." Other names used for similar classes include "Opportunity Classes;" "Individual Progress Classes," etc.

Finally, segregation of the gifted into special schools, either public or private, is a fifth method. This plan usually means both an enriched curriculum and some degree of accelerated progress (Goodenough, 1956).

The Significance of the Problem

Although diverse methods have been proposed and tried, much remains to be done in terms of developing adequate curriculum for gifted children. Those areas of curriculum most likely to need adjustment in dealing with the academically talented are those in which the greatest demands are made for the student to use abstract symbols, to think critically and creatively, to apply knowledge to novel situations, and to generalize (Saunders, 1961).

Torrance (1961) feels that perhaps the most promising area, if one is interested in what can be done to encourage creative talent to unfold, is that of experimentation with teaching procedures which will stimulate students to think independently, to test their ideas, and to communicate them to others. Thus it is evident that more research is needed in the area of promoting creative thinking in gifted children.
The Problem

This experimental research project is specifically directed to the question of the effectiveness of sound filmstrips and accompanying directed discussion as a teaching aid to promote creative thinking in gifted junior high students. This project is limited to junior high students, specifically seventh and eighth graders. All results and conclusions will be made only in terms of this designated group.

Definitions

Before a review of literature can adequately be made a few basic definitions need to be established. These definitions will act as a foundation and framework for an investigation of the gifted student and the stimulation of creative thinking in such students.

A gifted student is one in K-6 grades who scores at 130 or higher on the Revised Stanford-Binet Scale- Form L-M or is in the 98th percentile or higher in group achievement tests in Grades 7-12. The following words may also be used interchangeably for stylistic variety: gifted, superior, able, bright, academically talented, outstanding, or advanced.

A nongifted student is one in K-12 who is not designated as gifted in the above manner.

Creative thinking is autonomous, neither random nor controlled by some fixed scheme or external agent, wholly
self-directed thinking directed toward the production of a new form (unknown to the thinker before he began) (Suchman, 1962). Divergent thinking is usually the type involved in a creative endeavor (Guilford) although in the final evaluation convergent thinking is also involved in decision-making (Telford). In this research paper emphasis will be placed on individual creativity and primarily on divergent thinking.

It is hoped that as a result of this experimental research a small straw will be added to the growing stack of knowledge in order that the nation's greatest natural resource, her manpower, will be utilized to its fullest extent.
CHAPTER II
REVIEW OF THE LITERATURE

In reviewing the literature pertinent to this study two natural divisions occur: giftedness and creativity. The first section of this chapter will deal with the characteristics, needs, and educational goals for the gifted. The second section will contain a review of the literature pertaining to the question of I.Q. and creativity. In the third section the theories of creativity, the characteristics of a creative person, and methods of facilitating creativity will be discussed. Finally, the fourth section will elaborate on the use of instructional media to promote creativity.

The Characteristics, Needs, and Educational Goals For The Gifted

Ruth Strang (1960) has characterized gifted children as: mature earlier than the average; many are superior in school achievement while others show low achievement and an apparent lack of motivation; they are in most cases interested and avid readers; often there is difficulty in relating to one's peer group; many have the initiative and responsibility to make something of their gift in terms of a contribution to society; they sometimes have feelings of inferiority, even in academic work, and they tend to develop a philosophy of life earlier than the average. Marie Dellas (1969) views the creative student as having divergent thinking, an indepen-
dent spirit, and nonconformity; motivated by idiosyncratic values and goals; often manifesting inconsideration and indifference in social behavior.

The National Educational Association and American Personnel (1961) indicated that researchers who studied the gifted listed the following abilities which superior students often exhibit:

1. They use a large number of words easily and accurately.
2. They learn easily and rapidly without much rote drill.
3. They have a longer attention span on challenging material.
4. They ask meaningful questions.
5. They have an active interest in a wide range of topics.
6. They comprehend meanings, recognize relationships, and reason clearly.
7. They grasp abstract concepts.
8. They use original methods and ideas.
9. They are alert and observant.
10. They have great powers of retention.
11. Their questioning attitude makes them interested in finding out the reasons for observed phenomena. They constantly ask "why?"

Several researchers have been interested in studying sexual differences, if any, among gifted individuals. Havelock Ellis found only 55 women among 1,030 British
geniuses, and Cattell found only 32 women among one thousand most eminent persons in the world. Studies of superior children reveal a boy-girl ratio of 104 to 100 in the group with I.Q.'s above 140 and who are distributed in about the same relationship as the school population (Freehill).

Another study (Lewis, 1945) using group tests with highly verbal emphasis found ratios in favor of girls as high as 146.3 to 100.

In Terman's famous Stanford Genetic Studies of Genius (1925) the boy-girl ratio was 121 to 100; this ratio was later reduced to 116 to 100. The boys in the sample were not superior to the girls in the sample, but they were numerous enough to indicate statistically greater expectancy for intelligence above 140 among boys. The Stanford-Binet was the test instrument used in this experiment.

Although the gifted appear to have everything going for them, they do have some unique problems and needs. Self-discipline is something a gifted child needs to learn at an early age. Self-acceptance and an appreciation of the learning differences in others are also very important. Many times gifted children have difficulties in making vocational choices on account of their varied abilities and interests. Relations to peer groups and the resultant pressurus they impose on the individual to conform are often a source of great stress to the gifted student. Acceptance and understanding at home are sometimes lacking when parents take an
attitude that their child is so far beyond them intellectually that they cannot reach him.

In the area of learning gifted children have many unique problems and needs. Gifted learning is characterized by increasing adequacy of perception and organization more than by simple accumulation. It is less additive (quantitative) than usually supposed and is more organizational (qualitative) as fine discriminations and simpler orders or arrangements increase the validity of perceptions and behaviors. Gifted children learn through complex methods, discovery of generalizations, and independent work (Freehill, 1961).

Some of the problems gifted children face in learning are preciseness in scientific matters, closure in finishing a task when the end becomes apparent, and in general, adequate motivation. Sources of motivation for the gifted can be divided into two categories: intrinsic and extrinsic. Intrinsic needs include: curiosity, the need for love and self esteem, the need for self-actualization, and the need for achievement, a feeling of success and accomplishment. Extrinsic needs are the acceptance of the individual by his present society which includes teachers, peers, and family. Competition, often a real source of motivation for other children, is perhaps really detrimental to gifted children who can delay rewards longer than the normal child (Thomas).

Education for the gifted must be designed in terms of the children's individual differences. Ruth Martinson (1962)
in a bulletin of the California State Department of Education reported that the vast majority of parents of gifted children reported their children to be highly motivated toward school, yet in need of stimulation to put forth full effort. She further explained that the typical gifted pupil is delighted at the prospect of learning all about everything in the world. He thrives best in an atmosphere rich in opportunity for free discussion, independent thought, and high-level performance. He enjoys extending and exerting himself in the realm of creative thought. He requires, therefore, an environment in which individual progress, imagination, and originality are valued and nurtured (Martinson, 1962).

After studying the needs of gifted children, certain student-related goals were developed by the National Education Association (1960). The following goals were deemed necessary to help achieve effective programming for the able student.

1. Become intellectually curious, searching for meanings and seeking to find new relationships rather than old facts.

2. Improve the ability to do independent study and carry on research with attention to basic work habits, study skills, and methodology.

3. Learn to apply a wide range of knowledge and principles to the solution of many life problems.


5. Develop skills in critical thinking, gain a passion for truth, become open-minded with a sense of suspended judgment.

6. Realize the responsibilities as well as the power of knowledge.
7. Develop leadership ability including personal poise, respect for the worth of others, skill in group dynamics and person-to-person relationships.

8. Extend any tendency toward creativeness of various types.

9. Sense the implications of change.

10. Perfect skills in communication.

11. Develop the breadth of vision to see the possibilities of the future, the realities of the present, and the heritage of the past; to see in all this the continuing stream of man's ideas and questions and concerns.

In summary, it appears that the educational system can provide for the gifted child in many important ways in an effort to meet his needs. An educational environment where learning is important and his intellect is respected is essential. The gifted child must be exposed to larger bodies of knowledge than the normal child. Basic opportunities to interact with teachers who recognize that he sometimes requires more freedom, less control, and time to make discoveries are necessary. A climate where a student may discuss, examine, and support a position or a stand without fear or ridicule by his peers or the intervention of personalized teacher value judgments is a must.

The educational system also needs to provide opportunities for the gifted child to hear and speak with persons who can act as models, both implicitly and explicitly, and who intellectually represent the gifted community. The gifted
child needs also to be given training in the acquisition of work habits which will contribute to his success in school and in later professional or business activities. And finally, as an integral part of all other provisions for the gifted, opportunities and encouragement which enhance the development of a positive self-concept should be provided (Mirman, 1971).

**Giftedness Versus Creativity**

Giftedness is usually determined on the basis of I.Q. tests such as the Stanford-Binet. Crow (1963) insists that creativity is not directly related to I.Q. A 1958 study by Getzels and Jackson at the University of Chicago pointed out two exceptions to the generalization that the majority of gifted children are high on both I.Q. scores and in creativity. They found that by using specially designed measures of creativity and conventional I.Q. tests it was possible in a population of 500 students from grades six through twelve to distinguish between those who scored in the top 20 per cent of the total sample on I.Q. measures but were not in the top 20 per cent on creativity. There was a mean difference of 23 I.Q. points between the two groups (High I.Q. - 150; High Creativity - 127). The groups differed in other characteristics. The high I.Q. group favored high marks, pep, character, and goal directedness and desired to possess now those qualities which would lead to success in adult life. The creative group favored a wide range of interests, emotional stability, and,
above all, a sense of humor and were less apt to select present aspirations in terms of remote success goals.

The relationship between creative thinking and intelligence has been the subject of many studies. An increasing number of psychologists and educators have come to recognize that creative talent is not synonymous with academic intelligence and is rarely covered by tests yielding an I.Q. (Anastasi). The nature of the traditional intelligence tests does not directly involve the ability to create new ideas or new things. The abilities needed in sensing problems, in being flexible, and in producing new and original ideas tend to be unrelated or to have only low relations with the types of tests entering into current measures of intelligence (Taylor, 1960).

The abilities measured by tests of creative thinking emphasize divergent kinds of thinking (fluency of ideas, flexibility, originality, and elaboration); sensitivity to problems, defects, and missing elements; and the ability to redefine and restructure problems, information, visual or auditory stimuli, and the like. Traditional measures of intelligence emphasize memory, recognition, and logical reasoning and call for convergent thinking or getting the "one correct or best answer" (Torrance, 1969).

The words "gifted" and "creative" are more precise when they are not used interchangeably or as sub-classifications of each other. They are terms, as evidenced by research, which describe different kinds of persons or at least
different attributes which may be found separately or in combination in the individual. The "gifted" student is one with great academic aptitude. A great deal is known about them and about appropriate educational provisions for them. A second group of students are those who have great ability for original thought, that which is new to them; these are the "creative." Far less is known about the creative, but there is reason to believe that this ability for original thought may be cultivated and that these students do not necessarily constitute the same group as the gifted (Durr, 1964).

Creativity: Its Characteristics, Nurture, and Educational Ramifications

Rollo May has stated that creativity is encounter of the intensely conscious human being with his world. There are many theories as to the origin, nature, and development of creativity. Although emphasis in this paper is centered on individual creativity and primarily on divergent thinking, it is of value to enumerate several of the theories. The "structure of intellect theory" explains creativity in terms of those children who have abilities in the "divergent productions slab." In Maslowian "mental health theory" creativity is the outcome of good mental health and progress toward self-actualization (Gowan and Torrance, 1962).

"Anti-authoritarian theory" holds the idea that democratic backgrounds and styles of life produce less rigid and more
original persons who are more creative. The "oedipal" theorist explains that creativity is the product of the child's response to the close affectional approach of the opposite sexed parent during the initiative period from four to seven years. Gowan has developed an "eclectic theory" of creativity. He sees creativity as an emergent characteristic of the escalation of the developmental process when the right amount of mental health, mental ability, and environmental factors are present.

Lowenfeld (1958) in investigating the nature of creativity points out that creative arrangement is marked by coherence, by a striving for higher forms of organization; not through arbitrary or set patterns but through arrangements which are both economical and appropriate to the individual work. Guilford and Lowenfeld found that sensitivity to problems is a major characteristic of creative work. High level processes involve both ideational fluency and flexibility. Studies show that creativity depends on ready association and easy production of new ideas.

Creativity has been viewed also as a process which can be divided into five distinct levels (Taylor, 1959). Expressive creativity, level one, is exemplified in children's spontaneous drawings and involves independent expression with little emphasis on the quality of the end product. Productive creativity, level two, exhibits heightened realism, objectivity, and completeness over level one. The third level, inventive
creativity, is a new way of looking at old things, a new application of basic ideas. Innovative creativity which is level four is an understanding of basic principals, thus making a significant modification of them. Jung and Adler's modifications of Freud's basic principals are an excellent example of innovative creativity. The most profound and fifth level of creativity is called emergentive creativity. It involves the development of entirely new principals or assumptions such as the work of men like Einstein, Freud, and Picasso.

Other studies in the development of creativity suggest that steady growth does not occur. A developmental growth curve of divergent thinking can be drawn for children in this culture (Torrance, 1962). Beginning at age three, there is an increase until a peak is reached at about four and a half years. A drop at age five is followed by a steady increase through the third grade. A severe drop at about the fourth-grade level then occurs followed by a period of recovery in the fifth grade, especially for girls. The creativity curve drops again at early adolescence, perhaps because of increased anxieties and demands for conformity. After seventh grade the curve ascends again until near the end of the high school period. Most of the growth curves then show either a leveling off or a slight decline. These studies suggest to teachers and curriculum directors the possible optimum periods in which to promote creativity in
elementary and high school students.

The creative child, like the gifted, is unique. Creative children prefer to learn on their own. They like to attempt difficult tasks and are searching for purpose in most tasks they undertake. In terms of identity they are searching for an understanding and acceptance of their uniqueness. They are usually aware of cultural sanctions against devergency and sometimes feel a psychological estrangement from other children (Torrance, 1961). Getzels and Jackson (1962) explain a sense of playfulness in creative adolescents: a special delight in playful intellectual activity for its own sake. They involve themselves in the game-like task, seemingly because of the intrinsic pleasure that accompanies their use of fantasy.

Bonsall and Neumann (1968) have compiled from many research studies a list of the traits of a creative person. These unique characteristics need to be understood by all educators before attempting to work with the creative.

1. Prefers complexity rather than simplicity, and some degree on imbalance.

2. Displays aptitudes of elaboration, fluency, flexibility, originality with semantic and symbolic materials.

3. Is tough-minded and flexible enough to cope with environmental stimuli in a novel yet acceptable fashion.

4. Displays more independence in judgment, self-assertiveness, and dominance than the less creative.
5. Does not become frustrated or anxiety-ridden when his performances do not meet standards of others.

6. Is more willing to break with custom; has less fear of dissent and contradiction than those less creative.

7. Is less threatened by situations which would affect the noncreative adversely.

8. Is stubborn in the pursuit of an aim; can be markedly preoccupied.

9. Does not accept authority on its own terms but challenges the ideas of authority.

10. Is capable of considerable self discipline.

11. Is particularly observant, intense, and extremely curious.

12. Has a tendency to seek alternate possibilities in the solution of problems.


14. Respects his intuition.

15. Possesses risk-taking tendencies.


17. Has perseverance and low distractibility.

18. Has high aspirations for future achievements.

19. Is eager to tell others about his discoveries.

Out of these characteristics arise special needs which the educator must be aware of in planning successful programs to enhance and facilitate creative learning. The creative student needs, according to Bonsall and Neumann (1968):

1. To gain personal mastery over experiences.
2. To resist those who wish him to surrender aspects of his own personal, unique, fundamental nature.

3. To accept and understand objective criticism.

4. To place values on a priority list.

5. To learn how to work within imposed structures.

6. To understand that creative behavior is only one of many behaviors at his command.

7. To understand that creative behavior tends to evoke negative responses from others.

8. To enjoy looking for novel solutions to problems.

9. To learn to accept his intuition.

Like most behavior, creative activity probably represents to some extent many learned skills. There may be limitations set on these skills by heredity, but Guilford (1952) is convinced that through learning one can extend the skills within those limitations. He believes the intellectual characteristics most likely to be valid measures of creative talent include: originality, redefinition, adaptive flexibility, spontaneous flexibility, fluency of associations, fluency of expressions, fluency of ideas, fluency of words, elaboration, and probably some evaluation factors.

A thirteen year experience with a course in creative problem-solving at the University of Buffalo was analyzed and evaluated by two research studies. The first study by Meadow and Parnes (1959) found that on five to seven measures of creative ability, students who had taken the one semester
course were significantly superior to the group of matched control subjects who had not taken the course. Criteria used in the evaluation of the ideas produced included both uniqueness and usefulness. The former group also showed significant gain on a scale devised "to assess factors of leadership ability, dominance, persistence, and social initiative."

The second study examined the persistence or carry-over effects of the creative-solving courses. Results indicated that the improvement in creative productivity persisted for more than eight months after completion of the course (Elnora Schmadel, 1960).

Another effort to facilitate creativity is The Purdue Creative Thinking Program developed by the Purdue School of the air. The series includes a set of 28 audio tapes which can be used with a tape recorder in the classroom or received by radio in areas where local educational radio broadcasts the series. The series also includes three or four activities for each tape. Each taped program begins with a presentation designed to teach a principal for improving creative thinking. A story about a famous American Pioneer follows. The stories are each about eight to ten minutes long, are dramatized, and use sound effects.

The activities for each program consist of printed directions, problems, or questions which are designed to provide practice in the creative thinking functions of
originality, flexibility, fluency, and elaboration. Both verbal and nonverbal activities are used.

Susan Thomas and John Feldhusen (1971) evaluated the program and came to several conclusions. First, the program does help children develop creative thinking abilities. It was most effective with fourth graders, next with fifth graders, and finally with sixth graders. Second, the exercises where the children actually practiced writing down their creative ideas, were the most effective part of the program. Third, of all the creative thinking abilities nonverbal fluency, or the ability to create many ideas in drawings, was developed more than the other abilities. Finally, groups using one part of the program rather than two or three parts showed greater increases in creative thinking. It might be concluded in summary that exercises seem to be the most valuable part of programs in stimulating creative thinking.

The characteristics of learning activities that facilitate creative behavior can be summarized as: incompleteness or openness of the learning experience; a requirement to produce something; and then to use it (Torrance, 1969). Thus educators are challenged by the enormous task of facilitating creativity for all students, gifted and nongifted alike.

Creativity for the individual student, in the final analysis, involves: self reliance, independent thought, motive power, inner drive or desire, the ability to continue in the face of difficulties, patience, and persistence; working
without constant direction, supervision, or praise; knowing how to fail intelligently; studying and using what is already known; an appreciation of the contributions of others; a critical attitude toward one's own work; and recognizing what is good and what needs improvement.

Creativity and Instructional Media

Films are tremendously helpful in the initial phase of the creative process, the input phase. They aid in furnishing the necessary experiential elements for subsequent creative thought and action. Such materials should always allow sufficient time for reflective study or thought and should also encourage library research to gain new ideas. Television and films offer techniques for the clear and detailed presentation or a rich variety of material and as a tool for demonstrating skills and techniques at close range (Mackinnon).

Television programs and films can be used to demonstrate the possibilities of many different solutions to a single problem. The aesthetic viewpoint can also be reproduced through television and films; therefore excellence and elegance in all fields of knowledge can be experienced by numbers of students (Mackinnon, 1966).

Torrance is concerned about the teacher variable and emphasizes that in developing audio-visual aids to promote creativity, the teacher preview them before using them.
Another important consideration is that instructional materials should reinforce uniqueness that is not descriptive in a student's response. Texts and teaching materials may have to partly focus explicitly on unsolved problem areas with emphasis on a forward view, instead of merely on past knowledge with a backward viewpoint (Taylor and Williams, 1966).

In developing television clips and films Beck suggests some criteria for problem-solving audio-visual materials. First, in terms of content, information must be conveyed to the viewer or listener; and second, there must be involvement and motivation of the learner. A learning climate needs to be induced in which the cognitive processes are involved. Every film or television program must be evaluated on its ability to keep issues open to induce reflective thinking and problem-solving (Beck, 1966).

Group discussion in conjunction with audio-visual aids also needs to be directed toward certain ends. An increase in ideas and discussion about a topic will probably occur among students after having a rich, active experience pertaining to that topic. Such enrichment can be provided by instructional media. Then discussion wherein some help by setting the stage while others make crucial leaps ahead by not meticulously following the discussion needs to be recognized and fostered (Taylor and Williams, 1966).

Mackinnon (1966) concludes that the greatest task in attempting to develop instructional media to encourage
creativity is to develop media which will be used for those who are not of the highest intelligence.

Richard S. Crutchfield at the Institute of Personality Assessment and Research attempted to facilitate creative thinking in problem-solving in fifth and sixth grade children by means of an autoinstructional training program. He used three matched pairs of classes, one class of each pair receiving the training and the other serving as a control. Detective stories were used because of their general interest to children.

The results showed that the experimental children had a three to one advantage over the controlled in solving problems of the type presented. This was measured after three weeks of training by a five hour battery of criterion tests of problem-solving, with several creative thinking tasks, and a report of an attitude questionnaire which was given previously. Five months later experimental students showed a two to one advantage over controlled students with regard to both the number of ideas generated and the originality of the ideas.

Conclusion

Gifted students must build a solid background of information and a wide array of thinking skills as a requisite for creative thought.

The fostering of self-discipline gives the gifted
student the perservance he needs for creative thought.

The promotion of individuality allows for creativity rather than conformity to the group.

The development of confidence in one's own abilities allows one to accept and use his unusual abilities.

Sensory awareness can be heightened by training and seems to be used to a greater extent in creative people.

The ability to approach problems in a variety of ways (Flexibility used as a measure on many tests) is one of the most important for the creative act and can be cultivated through proper instruction.

Instructional media are being developed and studied for use as effective facilitative techniques for promoting creativity. It remains to employ such instructional media in an effort to stimulate creativity in gifted students and then test the results of those efforts.
CHAPTER III
DESIGN AND PROCEDURE

Specific Statement of the Problem

It was the purpose of this study to investigate the use of audio-visual material as a teaching method to promote creative thinking in gifted junior high students.

Two major groups were used for the experiment. The Control Group did not see the sound filmstrip and was merely given the essay assignment, the measuring instrument of creative thinking. The Experimental Group was shown the sound filmstrip followed by a short discussion on some relevant questions, and then was given the essay assignment. Each group contained 20 students: an equal number of gifted and nongifted students and also an equal distribution by sex in each level of giftedness.

A three-way factorial analysis of variance was used on the groups to determine whether there were significant differences between them.

General Methodology

The junior high students were assigned to both the Experimental and Control groups by means of stratified randomization, keeping in mind sex and the level of giftedness distribution, during the fall quarter of 1971, late October.

The Experimental Group was shown the sound filmstrip

The Experimental Group participated in the accompanying discussion of the filmstrip topic after each section of the filmstrip.

On the next day, November 12, 1971, following the showing of the filmstrip and the accompanying discussion, both groups were given a piece of lined paper with the essay topic dittoed on the top and asked to write an essay on that topic.

All the data was gathered by December 1, 1971.

The essays were evaluated by three judges (two teachers and a counselor) and assigned a creativity score.

Research Design

This study proposes to answer the following question:

Will the showing of a selected sound filmstrip to junior high students stimulate creative thinking in the designated gifted?

Definitions

The definitions of "gifted" and "nongifted" students as well as "creative thinking" have been previously given. The reader is referred to Chapter I for these definitions.

The Sound Filmstrip According to the suggestion made by Chubb (1964), the following information is being given about the filmstrip:

1. Title: "Values For Teenagers: The Choice Is Yours"
2. Two full-color filmstrips on forming teenage values.  
   Part One- "Confusions"- 18 minutes  
   Part Two- "Decisions"- 14 minutes

3. The manual provides a group of questions to be used after showing each filmstrip for group sessions.

4. One filmstrip will be shown each day and a short discussion will follow each showing.

5. Both filmstrips are in full color.

6. Two 12" long playing 33 1/3 records provide the narration.

7. A regular filmstrip projector and school record player will be used for the showing.

8. The Experimental Group will be shown the filmstrip.

9. The filmstrip was borrowed from the San Francisco office of Guidance Associates, Harcourt, Brace & World.

10. The showing of the filmstrips and accompanying discussion will take two days (two separate 45 minute class periods).

The Experimental Group had a chance to discuss the ideas presented by each filmstrip following each individual showing. Chairs were prearranged in a semi-circle. The discussion leader sat among the students and tried to promote an atmosphere of informality which would encourage open discussion. The students were to lead the discussion with whatever issues or questions they felt were important. The manual gave a list of questions which might be used to stimulate discussion if the students did not take the initiative. The following is a list of some of the questions which were used as discussion starters:
Part I: Confusions

1. Do you think confusion is common to all teenagers... that it's just part of being a teenager?

2. What about that whole question of developing habits?

3. How do you feel when you do something for someone else?

4. Why do you think parents may have such a difficult time explaining why they do or do not want you to do something?

5. In your dating experience, do you think there is always one partner who is more aggressive than the other?

6. Everyone says cheating is wrong, yet a lot of people do it regularly... a small thing here, another there. Why, then, do you think people feel guilty when cheating?

7. Do you think you will feel more or less pressure on you when you are (A) holding down a job? (B) married, with children?

Part II: Decisions

1. How well do you think adults understand teenagers and their problems?

2. How do you think adults might come to understand you better?

3. What happens when the group wants to do something and you just don't want to do it and refuse to go along?

4. Does it bother you if the group criticizes you for being independent?

Research Sample

The population from which the sample groups were drawn was an intermediate school in Central Contra Costa County. The sample groups were equally composed of designated
gifted students (those students whose scores are 130 or higher on the Revised Stanford-Binet Scale—Form L-M or are in the 98th percentile or higher in group achievement tests) and the general population (those students who are not identified as gifted).

The intermediate school in this study is composed of over 800 7th and 8th grade students. Most of the students come from middle and upper-middle class homes; their parents are predominantly white collar workers and professionals. Out of the total population there were around 125 designated gifted 7th and 8th grade students.

Twenty gifted students (10 male and 10 female) were randomly chosen and assigned to the Experimental and Control groups. Likewise twenty nongifted students (10 males and 10 females) were randomly chosen and assigned to the Experimental and Control groups. Thus the Experimental Group consisted of 10 gifted students (5 males and 5 females) and 10 nongifted students (5 males and 5 females). The Control Group consisted of 10 gifted students (5 males and 5 females) and 10 nongifted students (5 males and 5 females). N=40

**Procedures**

This experimental research study attempted to promote or stimulate the creative process in the Experimental Group of junior high students. Schultz (1967, pgs. 61-62) summarizes the creative process as follows:
1. FREETING OR ACQUISITION. Before one is able to use his experience in unusual, productive, and satisfying (that is creative) ways, he must acquire a repertoire of experiences. He must be open to experience, able to perceive and sense his environment, and be aware of his own internal feelings.

2. ASSOCIATION. After being acquired, the experiential elements within a person must be related to each other. An individual must have the ability to associate two or more experiences which can lead to a useful product when they are joined.

3. EXPRESSION. Once these elements are connected, they must be emitted in spoken, or written, or bodily expressive form. The association remains useless unless it can be communicated adequately.

4. EVALUATION. Many products may be generated in the course of creative activity, but the evaluation as to which of these satisfy the situation, and which are worthless, is essential. This phase distinguishes the bizarre from the creative, and the productive from the mundane.

5. PERSEVERANCE. After the generation of an original idea or product, detailed work is usually in order. An enduring contribution involves much underlying effort.

The first four steps of the above described creative process were generated in this study. The fifth step was not included. In step #1 the student was shown the sound filmstrip. This served as an experience to add to his repertoire of previous experiences. ASSOCIATION was encouraged by the method of presentation in the filmstrip and also by discussion.
Some EXPRESSION was displayed during the discussion periods, but the main body of EXPRESSION was considered to be the essays which the students wrote. Finally, the EVALUATION of the essays by three judges attempted to determine the creativity level attained by each student in his essay.

**Statistical Procedures and Hypotheses**

A 2x2x2 factorial analysis was performed to determine the F ratios and an F Distribution Table (Bruning and Kintz, p. 225) consulted for the significance level. The hypothesis was rejected unless a .05 level of significance was reached. The data analysis was performed by use of a Control Data 3150 Computer System.

A Duncan Multiple Range Test would be used, if needed, to determine which specific groups actually differed significantly in terms of a comparison of means (Bruning and Kintz, p. 115).

Figure 1 illustrates each cell that was analyzed.

**Hypotheses** The following hypotheses were tested in this research study: (.05 level of significance)

- **H_1** There is a significant difference for all students between treatment and control. This hypothesis was tested by an F ratio.

- **H_2** There is a significant difference in creativity scores between gifted and nongifted students. This hypothesis was tested by an F ratio.
FIGURE 1

Experimental Design

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>T  = Treatment</td>
<td>Creativity- from scores on the essays</td>
</tr>
<tr>
<td>G  = Giftedness</td>
<td></td>
</tr>
<tr>
<td>S  = Sex</td>
<td></td>
</tr>
<tr>
<td>Interactions among above</td>
<td></td>
</tr>
</tbody>
</table>
H₃ There is a significant difference between Experimental and Control groups on a basis of giftedness level. This hypothesis was tested by an F ratio. (TxG)

H₄ There is a significant difference between Experimental and Control groups on a basis of sex. This hypothesis was tested by an F ratio. (TxS)

H₅ There is a significant differential effect on creativity, a different response to treatment, between gifted and nongifted. This hypothesis was tested by the triple interaction F ratio. (TxGxS)

H₆ There is a significant difference between male and female gifted students in the Experimental Group. This hypothesis was to be tested by comparing the means using a Duncan Multiple Range Test.

H₇ There is a significant difference between male and female gifted students in the Control Group. This hypothesis was to be tested by comparing the means using a Duncan Multiple Range Test.

H₈ There is a significant difference between male and female nongifted students in the Experimental Group. This hypothesis was to be tested by comparing the means using a Duncan Multiple Range Test.

H₉ There is a significant difference between male and female nongifted students in the Control Group. This hypothesis was to be tested by comparing the means using a Duncan Multiple Range Test.
The Measuring Instrument

Both groups were given a piece of lined paper and after a preliminary explanation of the topic were asked to write on the following subject:

Do you think you really have a choice these days, or do you think a combination of group pressures and the desire on the part of many people to conform--to "fit in"--has denied you freedom of choice?

The students had an entire class period of 45 minutes to write whatever they wanted to say. All participants were told that this in no way influenced their grade in any class or their academic, social, etc. standing. They were told that it was an experiment, and that they were free to write whatever and as much as they wanted. When each student finished he had his paper collected, and he was free to return to his regular class.

Scoring The Essay The Torrance Tests of Creative Thinking (1966)-Verbal Forms were studied as a possible model for scoring the creative essay. Fluency, flexibility, and originality were used by Torrance as his main criteria for scoring. Fluency refers to the relevance of ideas to the main theme. Guilford (1962) refers to this as "associational fluency" when thinking by analogy is employed as strategy in solving problems. Flexibility refers to the number of ideas in different categories that can be generated by the student. Originality refers to the uniqueness of
ideas, explained by Guilford (1962) as empirical signs of novelty judged in terms of the statistical infrequency of a response among members of a certain population that is culturally relatively homogeneous.

On account of the difficulty involved in assessing creative work a Pilot Study was run. An average, regular, 8th grade English class was asked to write an essay on the assigned topic, as previously quoted, without seeing the filmstrip or being involved in the accompanying discussion. The class was told to write what they wished and that the essay would not be graded. The 23 essays were given to the three judges to rank in order of creativity, keeping in mind Torrance's three criteria. The judges were then asked to specify which elements of the essays contributed to their overall creativity judgment. The judges then met and decided upon their own norms for the research study essays. The judges decided upon the following criteria:

1) Relevance of ideas to the main theme
2) Depth of analysis- cause and effect relationship
3) Number of thoughts or ideas in relation to the topic
4) Uniqueness of ideas, especially involving self and one's feelings

When the experimental study was run, the judges applied their criteria to the 40 essays, reading them carefully, and scoring each essay in the following manner:
4- most creative
3- creative
2- average
1- below average
0- no creativity

The judges did not see the filmstrip nor hear any of the discussion before scoring the essays. All essays were completely anonymous, and each judge independently scored the 40 essays without knowledge of the other two judges' scores.
CHAPTER IV
RESULTS

After conducting the experimental research study, all the hypotheses were tested in terms of the data. The results are presented in this chapter. In all cases, the rejection or acceptance of the nine hypotheses was made at the .05 level of significance. All significant data are indicated by an (*) in the tables. When another probability level was found, it was also noted. Data which were not significant were identified by the abbreviation (NS).

Experimental Analysis

Each of the 40 essays was scored by the three judges. Then the cumulative points were added together to make a total score for each essay. The scores were then typed on data control cards, and a three-way analysis of variance was run on the 3150 Computer.

From this analysis of variance between the Experimental and Control groups, F ratios were obtained. The results of this experimental analysis of the variance are found in Table 1.

Hypothesis One

Hypothesis One which asked if there was a difference for all students between treatment and control proved negative. No significant difference was found between the Experimental and Control groups as measured by the main effects F ratio.
TABLE 1
Summary Table

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F Ratios</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment (T)</td>
<td>1</td>
<td>6.40</td>
<td>6.40</td>
<td>1.5284</td>
<td>NS</td>
</tr>
<tr>
<td>Giftedness (G)</td>
<td>1</td>
<td>.90</td>
<td>.90</td>
<td>.2149</td>
<td>NS</td>
</tr>
<tr>
<td>Sex (S)</td>
<td>1</td>
<td>10.00</td>
<td>10.00</td>
<td>2.3881*</td>
<td></td>
</tr>
<tr>
<td><strong>Interaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T x G</td>
<td>1</td>
<td>.00</td>
<td>.00</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>T x S</td>
<td>1</td>
<td>2.50</td>
<td>2.50</td>
<td>.5970</td>
<td>NS</td>
</tr>
<tr>
<td>G x S</td>
<td>1</td>
<td>.00</td>
<td>.00</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>T x G x S</td>
<td>1</td>
<td>.099</td>
<td>.099</td>
<td>.0239</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Within Groups</strong></td>
<td>32</td>
<td>134.00</td>
<td></td>
<td>4.1875</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>39</td>
<td>153.90</td>
<td></td>
<td>3.94615</td>
<td>NS</td>
</tr>
</tbody>
</table>

*Significant at the .15 level.

F .95 (1.32) = 4.17
(Table 1) or as indicated by the grand mean scores (Table 2); thus Hypothesis One was rejected.

**Hypothesis Two**

Hypothesis Two which asked if there was a difference in creativity scores between gifted and nongifted students proved negative. No significant difference was found between the gifted and nongifted students as measured by the main effects ratio (Table 1) or as indicated by the grand mean scores (Table 3); thus Hypothesis Two was rejected.

**Hypothesis Three**

Hypothesis Three which asked if there was a difference between Experimental and Control groups on a basis of giftedness level proved negative. No significant difference was found between the Experimental and Control groups in terms of giftedness as measured by the interaction F ratio (Table 1) or as indicated by the grand mean scores (Table 4); thus Hypothesis Three was rejected.

**Hypothesis Four**

Hypothesis Four which asked if there was a difference between the Experimental and Control groups on a basis of sex proved negative. No significant difference was found between the Experimental and Control groups in terms of sex as measured by the interaction F ratio (Table 1) or as indicated by the grand mean scores (Table 5); thus Hypothesis Four was rejected.
### TABLE 2

A Comparison of the Mean Scores For All Students Between Experimental and Control Groups

<table>
<thead>
<tr>
<th></th>
<th>MALE Gifted</th>
<th>MALE Nongifted</th>
<th>FEMALE Gifted</th>
<th>FEMALE Nongifted</th>
<th>Grand Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPERIMENTAL</td>
<td>5.0</td>
<td>4.8</td>
<td>5.6</td>
<td>5.2</td>
<td>5.15</td>
</tr>
<tr>
<td></td>
<td>Submean 4.9</td>
<td></td>
<td>Submean 5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONTROL</td>
<td>5.4</td>
<td>5.0</td>
<td>6.8</td>
<td>6.6</td>
<td>5.95</td>
</tr>
<tr>
<td></td>
<td>Submean 5.2</td>
<td></td>
<td>Submean 6.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 3

A Comparison of the Mean Scores for Creativity Between Gifted and Nongifted Students

<table>
<thead>
<tr>
<th></th>
<th>MALE</th>
<th></th>
<th>FEMALE</th>
<th></th>
<th>Grand Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
<td>Experimental</td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>GIFTED</td>
<td>5.0</td>
<td>5.4</td>
<td>5.6</td>
<td>6.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Submean 5.2</td>
<td></td>
<td>Submean 6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NONGIFTED</td>
<td>4.8</td>
<td>5.0</td>
<td>5.2</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Submean 4.9</td>
<td></td>
<td>Submean 5.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.7

5.4
TABLE 4

A Comparison of the Mean Scores Between Experimental and Control Groups on a Basis of Giftedness

<table>
<thead>
<tr>
<th></th>
<th>EXPERIMENTAL</th>
<th></th>
<th>CONTROL</th>
<th></th>
<th>Grand Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>GIFTED</td>
<td>5.0</td>
<td>5.6</td>
<td>5.4</td>
<td>6.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Submean 5.3</td>
<td></td>
<td>Submean 6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NONGIFTED</td>
<td>4.8</td>
<td>5.2</td>
<td>5.0</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Submean 5.0</td>
<td></td>
<td>Submean 5.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TABLE 5**

A Comparison of the Mean Scores Between Experimental and Control Groups on the Basis of Sex

<table>
<thead>
<tr>
<th></th>
<th>EXPERIMENTAL</th>
<th></th>
<th>CONTROL</th>
<th></th>
<th></th>
<th>Grand Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gifted</td>
<td>Nongifted</td>
<td>Gifted</td>
<td>Nongifted</td>
<td>Gifted</td>
<td>Nongifted</td>
</tr>
<tr>
<td>MALE</td>
<td>5.0</td>
<td>4.8</td>
<td>5.4</td>
<td>5.0</td>
<td>5.2</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>Submean 4.9</td>
<td></td>
<td>Submean 5.2</td>
<td></td>
<td>6.8</td>
<td>6.6</td>
</tr>
<tr>
<td>FEMALE</td>
<td>5.6</td>
<td>5.2</td>
<td>6.8</td>
<td>6.6</td>
<td>6.7</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>Submean 5.4</td>
<td></td>
<td>Submean 6.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hypothesis Five

Hypothesis Five which asked if there was a differential effect on creativity, a different response to treatment, between gifted and nongifted, male and female, proved negative. No significant difference was found in terms of treatment, giftedness, or sex as measured by the triple interaction F ratio (Table 1) or as indicated by the grand mean scores (Table 6); thus Hypothesis Five was rejected.

Hypothesis Six

Hypothesis Six which asked if there was a difference between male and female gifted students in the Experimental Group was negative. No significant difference in terms of sex was found in the Experimental Group as indicated by the triple interaction F ratio (Table 1) and the mean scores (Table 7); therefore a Duncan Multiple Range Test was not needed to reject the hypothesis.

Hypothesis Seven

Hypothesis Seven which asked if there was a difference between male and female gifted students in the Control Group was negative. No significant difference in terms of sex was found in the Control Group as indicated by the triple interaction F ratio (Table 1) and the mean scores (Table 7); therefore a Duncan Multiple Range Test was not needed to reject the hypothesis.
<table>
<thead>
<tr>
<th></th>
<th>EXPERIMENTAL</th>
<th></th>
<th>CONTROL</th>
<th></th>
<th>Grand Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>GIFTED</td>
<td>5.0</td>
<td>5.6</td>
<td>5.4</td>
<td>6.8</td>
<td>Submean 5.3</td>
</tr>
<tr>
<td>NONGIFTED</td>
<td>4.8</td>
<td>5.2</td>
<td>5.0</td>
<td>6.6</td>
<td>Submean 5.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Submean 6.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Submean 5.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MALE</td>
<td>FEMALE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GIFTED EXPERIMENTAL</td>
<td>5.0</td>
<td>5.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GIFTED CONTROL</td>
<td>5.4</td>
<td>6.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hypothesis Eight

Hypothesis Eight which asked if there was a difference between male and female nongifted students in the Experimental Group was negative. No significant difference in terms of sex was found in the Experimental Group as indicated by the triple interaction F ratio (Table 1) and the mean scores (Table 8); therefore a Duncan Multiple Range Test was not needed to reject the hypothesis.

Hypothesis Nine

Hypothesis Nine which asked if there was a difference between male and female nongifted students in the Control Group was negative. No significant difference in terms of sex was found in the Control Group as indicated by the triple interaction F ratio (Table 1) and the mean scores (Table 8); therefore a Duncan Multiple Range Test was not needed to reject the hypothesis.
## TABLE 8

A Comparison of the Mean Scores Between Nongifted Experimental and Nongifted Control in Terms of Sex

<table>
<thead>
<tr>
<th></th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONGIFTED EXPERIMENTAL</td>
<td>4.8</td>
<td>5.2</td>
</tr>
<tr>
<td>NONGIFTED CONTROL</td>
<td>5.0</td>
<td>6.6</td>
</tr>
</tbody>
</table>
Interpretations

This study hypothesized that gifted junior high students would be stimulated in creative thinking by the use of a sound filmstrip with accompanying discussions. It was assumed that this creative thinking would be measurable by means of an essay on an assigned topic and that judges could adequately evaluate these essays and assign them valid creativity scores.

The three-way analysis of variance resulted in a series of F ratios (Table 1) which did not reach the .05 designated level of significance. Hypotheses One through Five were all rejected. The results prove that the audio-visual method used in this study did not successfully promote creativity in gifted junior high students. There was no significant difference between Experimental and Control groups for the students in general, nor on a basis of sex or giftedness. Creativity scores between gifted and nongifted students exhibited no significant difference. The triple interaction ratio accounting for a differential effect on creativity between gifted and nongifted was overwhelmingly insignificant ( .0239 when F .95 (1,32)= 4.17).

It was not necessary to perform the Duncan Multiple Range Tests, as suggested in the experimental design, on account of the insignificant triple interaction F ratio which indicated that there was no significant difference from the main effects. Therefore Hypotheses Six through
Nine were also rejected. Sexual differences in gifted and nongifted students in both Experimental and Control groups were not significant.

A further examination of the data reveals that the main effects F ratio (Table 1) indicating overall differences in sex, although not directly tested in a hypothesis, was significant at the .15 level. This was not significant enough to influence the study as a whole because significance was set at the .05 level. Nevertheless this data indicates that there is a possible sexual difference in creativity scores. By consulting Tables 7 and 8 it becomes apparent that both gifted and nongifted females scored higher than both gifted and nongifted males in the Control Group. The respective female mean scores were 6.8 and 6.6 in contrast to the male scores of 5.4 and 5.0. Thus statistically the sexual difference is approaching significance and should be explored further in the future.

Implications of This Study

Because all hypotheses tested were rejected it is difficult to draw many implications from this study. Only a few general conclusions can be made:

1. The particular treatment used to promote creative thinking was not an adequate stimulus to achieve the proposed goal.

2. There is no significant evidence to indicate that gifted students have any more creative potential than nongifted students.
3. In testing creativity the sex variable does not appear to make a significant difference in terms of creativity scores.

4. Creativity remains difficult to measure and perhaps there are more reliable and efficient methods than the one used in this study.
Conclusions

This study showed that the audio-visual method employed to stimulate creative thinking in gifted junior high students was inadequate in facilitating such creative thinking in the sample group. The group of students not receiving the treatment scored as well in creative thinking as did those who were purposefully stimulated toward a creative product. It also pointed out that nongifted students have as great a potential, if not greater, for creative thinking as gifted students.

Although female students, especially in the Control Group, scored somewhat higher than males there does not seem to be a real sexual difference in creativity scores. Males and females have similar creative potential.

Recommendations For Further Research

Keeping in mind that the goal of this research study was not accomplished, the researcher would definitely encourage others to make similar studies in an effort to add validity to these results or produce contrary evidence. The first area which needs to be examined carefully is the measuring instrument and scoring procedure. No doubt there is a more accurate instrument for measuring creativity which measures both verbal and nonverbal creative responses. The search
for a scoring procedure is also interminable; flexibility, fluency, and originality may not be the only criteria. Much research still needs to be done in terms of evaluating responses to determine whether they are creative or not and to what degree.

During the discussion periods in the treatment group there were many original ideas generated in response to the questions. No measurement instrument was being used at that time. In collecting the papers written on the third day the researcher noticed that many who had been so verbal just a day before turned in a paper with no more than one or two short paragraphs covering less than half a page. Had these students (they were notably males) done their creative thinking previously and expressed it orally and now saw no need for further expression? This is a variable which definitely needs to be considered and controlled in future research.

A second area of further research, or it might be called search, is to find a treatment which in all probability will produce significant measurable creative thinking. The researcher is convinced that audio-visual techniques which stimulate divergent thinking and avoid emphasis on closure can be successfully used to promote creativity. Many such audio-visual methods need to be investigated and tested in a research study in order to refine knowledge concerning techniques for facilitating creativity.
Environmental conditions is another area in which much research needs to be done. Is it possible that treatment given in one place at a set hour in another place at another time will produce contradictory results? What are the components of a creative environment? Perhaps it was presumptuous to assume that one could facilitate creative thinking in two short days in a normal classroom situation. The time element also warrants investigation. How long does the treatment need to be before results are measurable? How much fluctuation in length of treatment needs to be allowed for individual differences?

It is evident through this study and many others which have preceded this one that gifted students are not necessarily "gifted in creativity." Many of the characteristics given to gifted children apply to all children. The potential for creativity manifests itself in many ways in the general population, not in the gifted alone. Perhaps it would be more valuable to work with nongifted students in future studies, in an attempt to develop their natural abilities and help them also to realize self fulfillment.

The last element which effected this study and may also effect future studies is the sex variable. Did females score a bit higher in creativity because they seem to excell over males in verbal skills at this particular developmental period in their lives? Why do other studies show that adult males seem to outnumber females in creative endeavors? Is
this evidence contradictory or can it be explained by the age-old cliche that the woman's place when she becomes an adult is "in the home" as mother and housewife? Do females perhaps have creative talent that is being surpressed and wasted in their mature years on account of traditional roles? Certainly this area merits more research to discover whether junior high females are more creative than junior high males and if so, does this creative potential diminish as they grow older?

Limitations of This Study

Before concluding this paper it is necessary to enumerate the limitations under which the research study was conducted. The treatment was administered in a regular classroom with no special preparation for a creative environment. The sample size of 5 for each cell was small, and it is difficult to make accurate evaluations from such a small sample group.

The treatment lasted for only two days. During the treatment only one sound filmstrip unit was shown. This sound filmstrip was limited mainly to one theme: "choices or decision making."

In terms of the evaluation process, the judges were not given any special training for judging creativity. They developed their own criteria which may have reflected personal bias. Also all creativity was judged purely in terms of verbal expression, measured only by the essay.
And finally, there was no specific motivation for the junior high students to be expressive or creative. Motivation in this case is explained as an inner drive to be expressive. It can be triggered off by an outside stimulus, such as the sound filmstrip attempted to do, or by a promised reward. In this research experiment no catalyst other than the sound filmstrip was used. It appears to not have been a sufficient stimulus; therefore lacking any other specific motivation to be expressive, creativity occurred in an insignificant quantity and this research study proved negative.
REFERENCES


Parnes, Sidney J. Education and creativity. Teachers College Record, 1963, 64, 331-339.


