# AN EXPERIMENTAL STUDY: COMPARING A PATTERN APPROACH TO A CREATIVE APPROACH IN TEACHING MACRAME

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Deena Horst

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D.L.H.

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#### CHAPTER I

### INTRODUCTION

Many books have recently been published which deal with the revived art, macramé. In addition to the books a great many of the women's, school art, and crafts magazines have published articles dealing with macramé. Most of these articles and books dealt with teaching the art of macramé to their readers. The approaches to teaching macramé used by the articles and books were quite varied. For the purpose of this study the researcher grouped the articles and books into the following approaches to the problem of teaching this art:

- a. Books and articles with step-by-step instructions for the production of like projects, often included the colors and materials used.
- b. Basically source books or articles for knots and inspiration in which there was very little or no step-by-step instructions except in learning to tie the knots. These encouraged creativeness by the manner in which they were written.
- c. Those books and articles which were a combination of the first two approaches--some step-by-step and some encouragement for creativeness.

If the reading of the above-mentioned literature and learning the art of macramé from this literature was the manner in which most teachers of art learned macramé, the amount of creativity which these individuals required of their students' macramé could be based upon the amount of creativity encouraged by the articles or books to which they were exposed. Lowenfeld<sup>1</sup> spoke of studies done by various educators in his book, <u>Creative and Mental Growth</u>, which indicated that coloring books and patterns had a devastating effect upon the aspects of creativity of children, especially in their drawings of objects after having been introduced to drawings of like objects in coloring books and workbooks.

Literature reviewed led the writer to conclude that being able to be creative in making decisions is, no doubt, a factor in solving problems effectively; thus, creativity should be encouraged in each student in the classroom. Should the future creativity of students when working in macrame (or any other art project) be stifled because of his having followed a pattern then art educators would fall short of their obligation to teach students to be creative.

### Statement of the Problem

The purpose of this study was to compare the creative performance in the macramé projects of eighth grade craft students after having been introduced to the art through either (a) a pattern-approach or (b) a creative approach and to determine which, if either, approach was more advantageous when teaching for creativity.

### Definitions of Terms Used

<u>Abstract</u>. This term referred to the aspect of creativity which involved the skill of one to analyze the various parts of a problem or to see specific relationships.<sup>2</sup>

<sup>&</sup>lt;sup>1</sup>Victor Lowenfeld and W. Lambert Brittain, <u>Creative and Mental</u> <u>Growth</u>, fourth edition, (New York: The Macmillan Co., 1964) p. 22-25. <sup>2</sup>Ibid., p. 9.

<u>Aesthetic Sensitivity</u>. This term referred to a state of mind which is the sensitivity for harmonious relationships with the outside world or one's interest in what is beautiful.<sup>3</sup>

Associational Fluency. This term pertained to the completion of relationships, being involved in having ideas that fit a particular area, as when symbols are used in a drawing.<sup>4</sup>

<u>Auditive Sensitivity</u>. This term referred to the ability to use the ears not only for hearing but for listening for detailed characteristics and relationships of sounds.<sup>5</sup>

<u>Creative Macramé</u>. In this study this term was meant to refer to that macramé in which the creator had designed his/her own and which the process or the finished product satisfies the definition of creativity.

<u>Creative Process</u>. In speaking of the creative process, reference throughout this research was to the <u>process</u> of creating, not the created <u>product</u>. This was also referred to as the close and intense involvement one displayed during the process of creating.

<u>Creativity</u>. The word, creativity, when mentioned in the study, referred to the ability to invent new ideas and symbols, to rearrange established objects, patterns, or ideas into new ideas, objects, patterns, and to integrate new or borrowed ideas into previously organized systems or situations.<sup>6</sup>

<sup>3</sup>Victor Lowenfeld, "Creativity and Art Education", <u>School Arts</u>, 59: (October, 1959), p. 10-11.

<sup>4</sup>J.P. Guilford, "Factors That Aid and Hinder Creativity", <u>Crea-</u> <u>tivity: Its Educational Implications</u>, compiled by John C. Gowan and others, (New York: John Wiley and Sons, 1967) p. 110.

<sup>5</sup>Lowenfeld, op. cit., p. 8.

<sup>6</sup> June King McFee, <u>Preparation For Art</u>, (San Francisco: Wadsworth Publishing Company, Inc., 1961) p. 142-143. <u>Aesthetic Sensitivity</u>. This term referred to a state of mind which is the sensitivity for harmonious relationships with the outside world or one's interest in what is beautiful.<sup>3</sup>

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Lowenfeld, op. cit., p. 8.

<sup>6</sup> June King McFee, <u>Preparation For Art</u>, (San Francisco: Wadsworth Publishing Company, Inc., 1961) p. 142-143. <u>Criterion of Connectedness</u>. This term expressed the idea that creativity deals largely with relational structures; "it implies a fusion of elements into these new structures rather than a mechanical arranging of them; it means that connections are actually produced and are not found."<sup>7</sup> This criterion implied a condition imposed upon the creator by bringing already existing elements into a distinctive relationship with each other. <u>Criterion of Nonrationality</u>. Nonrationality was more than a condition of novelty; it was a cause of novelty. This term referred to the nonrational processes which "account for the seemingly effortlessness and the spontaneity of creativity."<sup>8</sup>

<u>Criterion of Openness</u>. This term designated these characteristics: sensitivity to the world, to other people, to impulses, tolerance of the unknown and the ambiguous from which meaning is acquired, acceptance of self as a source of values and the quality of freshness, freeness, and undetermined. All of these facilitated "the creative person's moving from the actual state of affairs which he is in at a given time toward solutions which are only possible and as yet undetermined."<sup>9</sup>

<u>Criterion of Originality</u>. According to Hallman, originality was defined as being "essential to the products which have emerged from the creative process and must have novelty, unpredictability, uniqueness, and surprise. Novelty means referring to newness, freshness, and inventiveness... Unpredictability refers to the relationship of the created object to other states of

<sup>7</sup>Ralph J. Hallman, "The Necessary and Sufficient Conditions of Creativity", <u>Creativity: Its Educational Implications</u>, compiled by John C. Gowan and others, (New York: John Wiley and Sons, 1967), p. 19-20.

<sup>8</sup>Ibid., p. 22-25. <sup>9</sup>Ibid., p. 27.

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affairs in the real world... . Uniqueness asserts that every instance of creativeness differs from every other... . Surprise refers to the psychological effect of novel combinations on the beholder."<sup>10</sup>

<u>Criterion of Self-Actualization</u>. Self-actualization asserted that creativity involved a fundamental change in personality structure, and that this change occurred in the direction of fulfillment towards becoming creative.<sup>11</sup>

Curiosity. The urge to explore, and the desire for novelty.<sup>12</sup>

<u>Elaboration</u>. The ability to work out the appropriate details of a plan, idea, or outline for a work of art was elaboration.<sup>13</sup>

<u>Empathy</u>. Empathy was akin to perception. It gave the faculty of identification with those things which are outside the body. Actually, it involved identifying the self through perception.<sup>14</sup>

Expressional Fluency. This term dealt with the ease of presenting ideas in a particular form.<sup>15</sup>

<u>Fantasy</u>. Fantasy was determined to be a form of curiosity that functions in the world of the imagination. In this study fantasy referred to those mental images which occur with the process of creating. "Ideas are conjured up and put together and rearranged for the sheer pleasure of the exercise."<sup>16</sup>

<sup>10</sup>Ibid., p. 21-22 <sup>11</sup>Ibid., p. 25.

<sup>12</sup>Guy Hubbard, <u>Art In The High School</u>, (Belmont, Calif.: Wadsworth Publishing Company, Inc., 1967) p. 88.

<sup>13</sup>Ibid., p. 85.

14 Manfred L. Keiler, <u>The Art In Teaching Art</u>, (Lincoln: University of Nebraska Press, 1961) p. 23.

<sup>15</sup>Guilford, op. cit., p. 110. Hubbard, op. cit., p. 90.

<u>Flexibility</u>. A factor of creativity, this term referred to one's capability to adjust swiftly to new situations which are new or to rapidly change one's thinking.<sup>17</sup>

<u>Fluency</u>. This term implied the ability "to create a large number of ideas in a short period of time, to be capable to think rapidly and freely."<sup>18</sup> <u>Functional Creativity</u>. This term referred to "that part of an individual's creativeness which he uses or expresses itself in his work or actions."<sup>19</sup> <u>Ideational Fluency</u>. This term dealt with the rate of generation of a quantity of ideas that fulfill particular specifications.<sup>20</sup>

<u>Imagination</u>. This term indicated the reproduction of a perception without the object which gave rise to that perception being present.<sup>21</sup> <u>Independence</u>. To be creative implied that a person will, from time to time, be alone in his views, and that he will have to trust his own convictions which is a type of independence.<sup>22</sup>

<u>Intellectual Sensitivity</u>. This was the "ability to distinguish from a bulk of knowledge what is essential from what is non-essential for its understanding and communication."<sup>23</sup>

<u>Kinaesthetic Sensitivity</u>. This was the type of sensitivity which referred to our detailed experience of our body motions throughout life in general.<sup>24</sup> <u>Macramé</u>. Macramé was an art form made by knotting cords. Many decorative and utilitarian objects have been made with this early textile art.

17 Lowenfeld and Brittain, op. cit., p. 18. <sup>18</sup>Ibid. <sup>19</sup>Lowenfeld, op. cit., p. 7. <sup>20</sup>Guilford, op. cit., p. 109. <sup>21</sup>Keiler, op. cit., p. 24. <sup>22</sup>Hubbard, op. cit., p. 90. <sup>23</sup>Lowenfeld, op. cit., p. 12. <sup>24</sup>Ibid., p. 8. 6

<u>Manipulation</u>. This term was defined as the ability to work with materials 25 and ideas.

Organize. An area of creativity which referred to one's "ability to put parts together in a meaningful way" was organize.<sup>26</sup>

<u>Originality</u>. Originality was a creativity aspect which implied the ability of one to think of new or unique responses and was the opposite of the usual or the accepted.<sup>27</sup>

<u>Perception</u>. Perception as used in this study referred to the "significant impression which an object or an event produced on the mind through various senses. It also implied that although an individual is consciously aware of the external world, he simultaneously-even, if largely subconsciouslyjudges and exercises discrimination in what he perceives."<sup>28</sup>

<u>Perceptual Sensitivity</u>. The refined use of our senses referred to the term perceptual sensitivity.<sup>29</sup>

<u>Potential Creativeness</u>. The creativeness which an individual has but does not necessarily use was termed potential creativeness. In the process of 'learning' or 'maturation' this part of his personality may have become neglected, inhibited, or buried. Potentially, he may be a creator, but his creativeness has been inhibited.<sup>30</sup>

<u>Reorganize</u>. This term referred to an area of creativity which included the capacity to rearrange ideas and to shift the uses and functions of objects, or to see them in a new light. It apparently referred to a quality that utilizes what was known, but for purposes which were new or different.<sup>31</sup>

<sup>25</sup>Hubbard, op.cit., p.88.
<sup>26</sup>Lowenfeld and Brittain, op.cit., p. 9.
<sup>27</sup>Ibid., p. 8.
<sup>28</sup>Keiler, op. cit., p. 19.
<sup>29</sup>Lowenfeld, op. cit., p. 8.
<sup>30</sup>Ibid., p. 7.
<sup>30</sup>Lowenfeld and Brittain, op. cit., p. 8.

<u>Sensitivity</u>. This referred to the ability of one to use "eyes not only for seeing but for observing, ears not only for hearing but for feeling" thus having a high degree of awareness of a material, a situation or anything unusual or promising.<sup>32</sup>

<u>Serendipity</u>. This term dealt with the discovery of unexpected things during a search for other things.<sup>33</sup>

<u>Social and Emotional Sensitivity</u>. "The ability to completely identify with one's own work and actions, to face one's own potentialities as well as one's limitations." referred to social and emotional sensitivity.<sup>34</sup> <u>Synthesize</u>. The factor of creativity which referred to one's capability "to combine several elements into a new form or whole" was called synthesize.<sup>35</sup>

<u>Tactile Sensitivity</u>. The ability one would have to differentiate and enjoy by touch the intricate varieties of forms which are textural and threedimensional and their relationships to each part.<sup>36</sup>

<u>Visual Perception</u>. This particular term referred to the use of one's eyes not only for seeing, or simply recognizing things, but for observing, or, in other words, penetrating into the detailed visual relationships which form the total impression.<sup>37</sup>

<sup>32</sup>Ibid., p. 7.
<sup>33</sup>Hubbard, op. cit., p. 89.
<sup>34</sup>Lowenfeld, op. cit., p. 12.
<sup>35</sup>Lowenfeld and Brittain, op. cit., p.
<sup>36</sup>Lowenfeld, op. cit., p. 8.
<sup>37</sup>Ibid.

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#### CHAPTER II

### REVIEW OF THE LITERATURE

Much has been written, recently, about creativity. Some psychologists, such as Torrance and Guilford, have become concerned about the seemingly lack of creativity, particularly, in the solving of world problems. Many writers, as Lowenfeld, Torrance, and Parnes, have attributed this lack of creativity to the methods of educating the young people, indicating that the mere memorization of facts had hardly prepared the leaders of today with the flexibility and understanding which was needed. With the rapidly changing world there came bigger and newer problems to which answers can not just be memorized, they must be created.

### Literature On The Creative Process

Creativity was described by Torrance<sup>38</sup> as being a process which had a dimension of time and which involved originality, adaptiveness, and realization. The time it took to be creative may have been as brief as in the jam session of a jazz band, or it may have involved a considerable span of years as was required for Einstein's creation of the theory of relativity.<sup>39</sup>

<sup>&</sup>lt;sup>38</sup>E. Paul Torrance, "Creative Teaching Makes A Difference", <u>Crea-</u> <u>tivity: Its Educational Implications</u>, compiled by John C. Gowan and others, (New York: John Wiley and Sons, 1967), p. 174-175.

<sup>&</sup>lt;sup>39</sup>Donald W. MacKinnon, "Identifying and Developing Creativity", <u>Creativity: Its Educational Implications</u>, compiled by John C. Gowan and others, (New York: John Wiley and Sons, 1967), p. 228.

The three phases of the creative process which were listed by MacKinnon are:

(1) a period of preparation during which one acquires the skills and techniques and the elements of experience which make it possible for one to pose a problem to oneself. (2) a period of concentrated effort to solve the problem, which may be suddenly solved without much delay or difficulty, but which perhaps more often involves so much frustration and tension and discomfort that out of sheer self-protection one is led to (3) a period of withdrawal from the problem, a psychological going out of the field, a period of renunciation of the problem of recession from it, (4) a period of insight accompanied by the exhilaration, glow, and elation of the "aha" experience, and (5) a period of verification, evaluation, 40 and elaboration of the insight which one has experienced.

Victor Lowenfeld said that "every individual is a potential creator, but not everyone's creativeness has been developed so that it can properly function."<sup>41</sup> This led the researcher to conclude that every person can be said to have both potential creativeness and functional creativeness.<sup>42</sup>

According to Keiler the creative process as such was referred to as being one of constant change, evolutionary in character, the purpose of which was to transform thoughts and feelings into constructive action.<sup>43</sup> This involved perception, empathy, and imagination.<sup>44</sup>

Ralph J. Hallman listed the following criterion on creativity:

The Criterion of Connectedness
 The Criterion of Originality
 The Criterion of Nonrationality
 The Criterion of Self-actualization
 The Criterion of Openness.

Lowenfeld also listed four other aspects of the creative process: sensitivity, of which there are four types;<sup>46</sup> fluency, of which Guilford<sup>47</sup>

<sup>40</sup>Ibid., p. 228. <sup>41</sup>Lowenfeld, op. cit., p. 6. <sup>42</sup>Ibid., p. 6-7. <sup>43</sup>Keiler, op. cit., p. 46. <sup>44</sup>Ibid., p. 18. <sup>45</sup>Hallman, op. cit., p. 19-27. <sup>46</sup>Lowenfeld, op. cit., p. 8. <sup>47</sup>Guilford, op. cit., p. 109-110. named three types; flexibility, of which two types were named by Guilford<sup>48</sup>; and the ability to reorganize or define.<sup>49</sup>

According to Lowenfeld there were four kinds of sensitivity which are termed essential to the creative process. They were as follows:

1. Perceptual sensitivity which includes visual perception, tactile sensitivity, kinaesthetic sensitivity, and auditive sensitivity.

2. Aesthetic sensitivity in which fundamental to any promotion of it in the arts is the recognition that the aesthetic product is only a record of the degree to which the individuals sensibilities have developed and have been brought into harmonious relationship with the external world.

Social and emotional sensitivity in which one identifies with materials so that he can predict the behavior of the media.
 Intellectual sensitivity in the arts is highly subjective although outside the arts can be objective.<sup>50</sup>

Guilford differentiated between three fluency factors and two flexibility

factors. The three fluency factors mentioned were

1. Ideational fluency has to do with the rate of generation of ideas.

2. Associational fluency pertains to the completion of relationships, in distinction from the factor of ideational fluency.

3. Expressional fluency deals with the facile construction of sentences.

The two flexibility factors were

 Spontaneous flexibility is the performance of one in terms of the number of times an idea changes a category of usage.
 Adaptive flexibility is where changes of some kind are made.<sup>52</sup>

In <u>Art In The High School</u> Hubbard designated one intellectual trait of creative behavior not mentioned by the other researchers: elaboration. Non-intellectual elements of creative behavior were designated by Hubbard as curiosity, manipulation, serendipity, fantasy, and independence.<sup>53</sup>

<sup>49</sup>Lowenfeld and Brittain, op. cit., p.7-8. <sup>50</sup>Lowenfeld, op. cit., p. 8.
<sup>51</sup>Guilford, op. cit., p. 109-110. <sup>52</sup>Ibid., p. 111.
<sup>53</sup>Hubbard, op. cit., p. 85-90.

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### Literature On The Cause Of Diminishing

### Powers Of Creativity

In "Training for Creativity" by Bryson the following statements were made:

It is common judgement that children are more free and fruitful in imaginative work than when they are older. This would suggest either that inventive powers fade with growth or that the education we provide for our youth tends to diminish these powers.<sup>54</sup>

Despite the fact that many research studies done earlier by researchers such as Witt (1959) which stated that creativity in an individual goes through specific developmental stages. (These stages supposedly were crisis periods and only a few were lucky enough to have creativity return after the crisis period was over.), Susan Nichols Pulsifer (1960) took another position when she stated that the abandonment of creativity at about the age of five was not a developmental change but was due to the sharp man-made change with which the fiveyear old was confronted and impeled him to follow its rules and regulations.<sup>55</sup>

E. Paul Torrance has written that one of the first bits of evidence that the Pulsifer study was correct

came from my experiences in studying the creative development of two fourth grade classes taught by teachers who are highly successful in establishing creative relationships with pupils and who give them many opportunities to acquire information and skills in creative ways. He continued to say that there was no fourth-grade slump in these classes, either, in measured creative activities.<sup>56</sup>

<sup>55</sup>Torrance, op. cit., p. 174-175. <sup>56</sup>Ibid., p. 175.

<sup>&</sup>lt;sup>54</sup>L. Bryson, "Training for Creativity", <u>School Arts</u>, 60: (September, 1960), p. 5.

With the administration of tests of creative thinking in different cultures it had been found that each culture treated curiosity and creative needs differently. If the loss or gain of creativity was purely developmental, the drop in creativity which occurred in U.S. children around the age of nine would also occur in other cultures. However, according to Torrance, this does not happen in the other cultures.

For purposes of illustration, let us examine the developmental curve for Somoan subjects. The level of originality begins in the first grade at the lowest level of any of the cultures studied but the growth is continuous from year to year. The second greatest continuity in development is shown by the U. S. Negro sample, although some of the specific cultural groups in India show curves almost identical to those of the Somoan subjects. Through the fourth grade, German and Australian children seem to show about the same level and pattern of development. Pressures towards standardization and conformity apparently occur quite early and continue for the Australian child but not for the German child. The overall pattern of growth among the children in India is much the same as in the United States, especially in the mission schools and public schools.<sup>57</sup>

L. Bryson, in an article of the <u>School Arts</u> magazine stated that "education damages possible creative abilities, partly because it is not made clear to students the differences between skill, which should be made as automatic as possible, and cultural conventions or objective information.<sup>58</sup>

Society teaches young children from birth how to behave, think, feel, and perceive. The home and school are basically institutions for drilling children in cultural orientations. The transmission of the cultural heritage is the implicit or explicit task of much of what is done by the parent and teacher. To a certain degree, this goal is commendable. Carried to an extreme, however, it loses sight of the fact that the creative individual-to some extent-must stand apart from his culture in order to produce a new idea, a novel image, or an original product.

<sup>57</sup>Ibid. p. 175-176. <sup>58</sup>Bryson, op. cit., p. 5-6.

<sup>59</sup>Stanley Krippner, "The Ten Commandments that Block Creativity", <u>Education Digest</u>, 33: (January, 1968), p. 23. Lowenfeld stated that step-by-step procedures counteract the experimental atmosphere and suppress flexible and fluent reactions...examples of these are coloring books, workbooks, and 'paint-by-number sets'.<sup>60</sup>

Studies by Torrance<sup>61</sup> and Pulsifer (1960) indicated that creativity continued to develop in children who lived in less-restricting cultures such as Western Somoa rather than to show a drop in creative development at about the fourth-grade level or earlier as was found in children from cultural communities such as Germany and the U.S. The researcher concluded that because of environmental pressures children have been encouraged to become less creative and thus the manner in which children were taught in the classroom could have made a difference in the development of their creativity. A statement made by Torrance seemed to effectively summarize this thought: ..."I believe creative needs and abilities are universal enough to make creative ways of learning useful for all children though not an exclusive way of learning for any children."<sup>62</sup>

### Literature On The Teaching Of Creativity

Several of those psychologists who have done studies on creativity in individuals contrary to earlier belief (and which is still held as fact by some) that creativity was inherited and can't be developed. Prior to 1955 neither Dr. J. P. Guilford, nor Richard Youtz uncovered any record of any research which concerned programs for the deliberate development of creative thinking.<sup>63</sup>

In summarizing the findings of four years of research Guilford wrote: "like most behavior, creative activity probably represents to some

63 Sidney J. Parnes, "Can Creativity Be Increased?", <u>Studies In Art</u> <u>Education</u>, No. 1, Fall, 1961, p. 42.

<sup>&</sup>lt;sup>60</sup>Lowenfeld, op. cit., p. 13-14. <sup>61</sup>Torrance, op. cit., p. 175-176.

<sup>&</sup>lt;sup>62</sup>Ibid., p. 176.

extent many learned skills. There may be limitations set on these skills by heredity; but I am convinced that through learning one can extend the skills within those limitations."<sup>64</sup>

At the University of Buffalo a research project dealing with teaching creativity in which students taking the course on creative problemsolving and those in the control group were carefully matched as to intelligence, age, sex, and time of class. Results of this phase of the research were analyzed and included these major findings:

1. The creative problem-solving students showed substantial gains in quantity of ideas on two tests of idea quantity repeated at the end of the course. Students in the control group showed relatively insignificant gains on these tests at the end of the semester.

2. On three tests of idea quality, the creative problemsolving students showed clear superiority over the students in the control group. On a fourth test in this area, the creative problem-solving students showed improvement greater than that shown by the control students, but not sufficiently greater to be regarded as significant. The fifth measure of quality showed no superiority for the creative problem-solving students.

3. Three tests were designed to measure personality traits designated by psychologists as 'dominance', 'self-control', and 'need to achieve'. The creative problem-solving students gained substantially in dominance as a result of the course, but showed no significant changes in self-control or need to achieve. The dominance scale used is regarded by psychologists as measuring such chacteristics as confidence, self-reliance, persuasiveness, initiative, and leadership potential. Other researchers previously had determined that dominance is a personality trait associated with creative persons.<sup>65</sup>

Researchers in creativity have become interested in art education as a means to developing creative talent. Sidney Parnes has said that "Victor Lowenfeld had strong feelings about this. He felt that creative problem-solving programs might develop creativity which can carry over to

<sup>64</sup>Sidney J. Parnes, "Can Creativity Be Increased", <u>Studies in</u> <u>Art Education</u>, No. 1, (Fall, 1961), p. 42 citing J. P. Guilford, "Some Recent Findings On Thinking Abilities and Their Implications," <u>T.A.</u> <u>& D. Informational Bulletin</u>, U. S. Air Force, Vol. 3, No. 3, 1952, p. 61.

other fields of endeavor. In Lowenfeld's research, he discovered that the creative factors involved in art were practically identical to those which J. P. Guilford isolated in the sciences."<sup>66</sup>

The Terman Junior High School Study was another study which investigated the growth in creativity of a group of thirty early-adolescent art students. These students were carefully selected and served as experimental subjects in a study which was designed to stimulate original thinking. "Having completed the study, we can say that the results suggest that divergent art experiences tend to develop creativity and imagination in early adolescent children. More specifically, we can say that these art experiences develop the following characteristics in individuals: (1) a higher degree of sensitivity, (2) an increased tendency to complex representation, (3) greater originality or freedom from stereotype, and (4) more skill in handling art media."<sup>67</sup>

### Literature On The History Of Macramé

The majority of authors writing on macramé agreed that macramé originated in Arabia in the 13th century although "knotted textiles were used as the fringes of costumes of Babylonian and Assyrian sculptures."<sup>68</sup>

Virginia Harvey, in her book, <u>Macramé: The Art of Creative Knotting</u>, suggested that knotting was an art that was so old that there was no record of its beginnings. One can only guess, but it seemed logical that man would have used a knot when he attached two vines together making his first step

<sup>67</sup>Cramer Owen, "An Investigation of Creative Potential At the Junior High Level", <u>Studies in Art Education</u>, 3: (Spring, 1962), p. 31.

<sup>68</sup>Sally Jones, "Macramé", <u>School Arts</u>, January, 1970, p. 37.

<sup>&</sup>lt;sup>66</sup>Ibid., p. 39.

toward forming a textile, preceding both spinning and weaving. The earliest knotted textiles that have survived were mentioned as being game bags and nets used for catching wild beasts, these being at the Kircheriano Museum in Rome, Italy. After 1500 macramé developed into its present form (mostly in Italy and Spain).<sup>69</sup>

The handmade fringe on woven ends of fabric was a technique long practiced by rugmakers in Mediterranean villages, and by French and Belgian nuns as ornament for ecclesiastical vestments and altar clothes... In the days when American ships pursued great whales, sailors whiled away empty hours sitting in macramé hammocks making scrimshaw and macramé belts and fringes as gifts for their families back home.<sup>70</sup>

Dona Meilach, in <u>Creative Design in Knotting</u>, wrote of the popularity of macramé until the "radio became popular and books more plentiful.... Through the early twentieth-century, belts, purses, leashes, lanyards, bell, light and shade pulls, and other strictly utilitarian objects were knotted in traditional designs and styles."<sup>71</sup>

Macramé was sometimes widely popular (even the Incas and the American Indians had their own versions), but at other times it was kept alive only by seamen to whom knotting was both work and diversion. Until recently, macramé had been dormant in the U.S. since 1857.<sup>72</sup>

Knotting in some form is native to most cultures, but knowledge of the more complex macramé was spread by travelers. No doubt some of the credit for spreading the technique to other parts of the world must be attributed to the missionaries of

<sup>69</sup>Virginia Harvey, <u>Macramé: The Art of Creative Knotting</u>, (New York: Van Nostrand Reinhold Company, 1967), p. 9.

<sup>70</sup>"How to Make Macramé", <u>House and Garden</u>, February, 1967, p. 141.

<sup>71</sup>Dona Meilach, <u>Macramé: Creative Design in Knotting</u>, (New York: Crown Publishers, Inc., 1971), p. 4-7.

<sup>72</sup>"Knotty But Nice", May 17, 1971, p. 50.

the religious orders. This credit must be shared by sailors, who found the craft a worthwhile way to spend idle hours of a long sea voyage.

Dona Meilach described the rebirth of macramé in the U.S. as

### follows:

Macramé, an art form made by knotting cords in imaginative combinations, is capturing the attention of contemporary artists and craftsmen. Fibers normally associated with industrial and domestic use are being applied to an expressive art statement, thus adding a new chapter to the history of modern textile arts.

### Methods Used In Books and Articles

### To Teach Macramé

Little was found to have been written on teaching macramé per se; however, the investigator observed that the way in which the writer of a book on macramé approached teaching the art to the reader implied, by example, how they believed macramé should be taught.

Handicraft magazine articles by such people as Mary Walker Phillips and Virginia Isham Harvey taught readers macramé only through diagrams of knots. No particular designs for projects are discussed, but types of projects are casually mentioned as possible beginning points.

In her book, Introducing Macramé, Eirian Short stated that

No recipes are given in the book, for, once the knots are learned and understood, it is a simple matter to 'read' a pattern from a photograph or drawing. It is hoped, however, that the reader, having grasped the principles of macramé will go on to create original and exciting designs.<sup>75</sup>

Other than telling the reader how to tie the knots through written directions and diagrams, Mrs. Short makes no attempt to have readers copying

<sup>73</sup>Harvey, op. cit., p. 14. <sup>74</sup>Meilach, op. cit., p. 3.

<sup>75</sup> Eirian Short, <u>Introducing Macramé</u>, (New York: Watson-Guptill Publications, 1970), p. 7-8.

the macramé which she pictures in her book, although she inferred this possibility.

Sally Jones suggested that "a diagram illustrating basic knots should be provided for each student and some samples can be tied as a prelude to tying a major piece. A small wall hanging is a good beginning project because it is large enough to try several designs and small enough so that it does not become too fatiguing before it is completed."<sup>76</sup>

In <u>Macrame: Creative Design in Knotting</u>, Dona Meilach discussed her intentions for her book by stating:

The emphasis is on creativity, expressiveness, and investigation into the artistic possibilities of string, twine, yarn, rope, and other cords. It is a stimulating art form for serious artists and craftsmen and for teachers at almost every grade level. ... The resulting line-space relationships make Macramé an excellent technique for exploring pure form and design as well as for creating individualized utilitarian items: clothes, belts, purses, and furnishings.<sup>77</sup>

Knots were taught to readers through photographs and written directions. Mrs. Meilach also guided readers to finding sources in nature, etc., for ideas to use in their macramé designs. She also discussed sculptural macramé and using macramé with other materials.

Virginia Harvey described her book, <u>Macramé: The Art of Creative</u> <u>Knotting</u> as having been "meant to serve as a springboard for the knotter who wishes to design his own work, as well as a guide for the craftsman who prefers to work from a pattern... The chapter on design will show you how the knots fit together to form patterns and serve as a reference and inspiration for designing your own patterns."<sup>78</sup>

<sup>76</sup>Jones, op. cit., P. 37.
<sup>77</sup>Meilach, op. cit., p. xi.
<sup>78</sup>Harvey, op. cit., p. 6-7.

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LeJeune Whitney Ackerman offered the following 'words for beginners':

Don't be influenced by others when planning your projects. Work with the materials you enjoy and the colors which please you. Your taste is your own individual property--resist letting others impose their tastes on you. ...Give yourself a chance to create something which is all yours--all the way!"<sup>79</sup>

Ironically, Mrs. Ackerman has included in this book, patterns for the reader to follow. These patterns require of the reader what this same writer previously warned against.

The writers of <u>Simply Macramé</u> made the following statements about their book:

This book teaches you these basic knots and then shows you how to combine them into a variety of beautiful designs. Simple diagrams and instructions accompany the knotting exercises which prepare you for any of the six final projects. By the time you have finished the belts...you will have a good basic knowledge of macramé and you will be eager to experiment with your own creations.<sup>80</sup>

The teaching in this book was as is suggested: patterns for the reader to use in order to learn macramé and then presumably the reader is left to design his own. The idea given to the reader to create his own after following patterns was a noble one, but there was a great possibility that the reader may instead only be graduated to more advanced patterns.

The literature reviewed implied to the researcher that while the books most generally taught the reader how to macramé, the crafts magazines featured the macramé of recognized artists and articles about those respective artists, rather than teaching readers the way to macramé.

Speculation by the investigator implied that perhaps because of the reading public's lack of desire to be or the fear to be creative, the

<sup>&</sup>lt;sup>79</sup>LeJeune Whitney Ackerman, <u>Macramé: A New Look At An Ancient Art</u>, (Sunnyvale, Calif.: LeJeune, Inc., 1971), p. 3.

<sup>&</sup>lt;sup>80</sup>Mary F. Singleton, William J. Singleton, Betty J. Weber, and P. Wes Weber, <u>Simply Macramé</u>, (Berkely, Calif.: Webton Enterprises, 1971) p. 2.

majority of the articles in women's magazines tended to teach the knots by having the reader make a project, such as a belt, following a pattern step-by-step. Following this first pattern or patterns are more intricate and more difficult patterns plus there also may be information giving addresses to which to send for kits or more 'exciting' patterns of things to make. Some encouraged the reader to first practice tying the knots then to "create your own patterns as you work."<sup>81</sup> In nearly the same breath step-by-step patterns were given.

Examples of such directions were found in the May, 1971 issue of the <u>Family Circle</u>:

Beaded Headband--Materials: 4 lengths of fine nylon twine, 5' long (dye 2 orange, 2 yellow); 2 lengths of fine nylon twine, 4' long (dye blue). Three beads (2 purple, 1 blue). Directions: Tie a Josephine knot in center of 2 yellow cords. Pin knot vertically on foam and tie 2 more Josephine knots, above and below it (see fig. 16, page 110). String 2 orange cords through middle yellow Josephine knot. Tie a Josephine knot on each side of middle yellow Josephine knot. Tie a Josephine knot on each side with the yellow and orange cords together. Repeat another orange and then yellow-and-orange Josephine knot on each side. String a blue plastic bead in center of headband; then string the 2 blue cords together. Place over middle yellow Josephine knot at center of headband; then string blue cords into top and bottom yellow knots, adding purple beads. Separate the 2 blue cords and run them along top and bottom of headband, stringing them in and out of yellow-and-orange knots. About 2" from last knot on each side, join 2 blue cords in a single Josephine knot. Using blue cords as holding cords, tie on each yellow and orange cord in a half-hitch. Then about 2" further along on each side, tie blue cords around other 4 cords. Knot ends of all cords."82

A variety of approaches to teaching macramé through written matter were available for those persons interested in learning macramé. Basically, these articles and books were divided into two different approaches:

<sup>81</sup>Morley B. Smith, "Macramé-Not as Knotty as It Looks", <u>Better</u> <u>Homes and Gardens</u>, February, 1971, p. 61.

<sup>82</sup>Deborah Harding and Patricia Curtis, "Macramé", <u>Family Circle</u>, May, 1971, p. 104. teaching macramé through patterns and teaching macramé without patterns. The majority of articles and small booklets approached teaching macramé through patterns and the books more broadly covering macramé tended to teach macramé without patterns.

#### CHAPTER III

### PROCEDURE

The experiment was designed to investigate the creative performance of students after having been introduced to the art of macramé by either a pattern-approach or an approach designed to encourage creativity. It was hoped to determine which, if either, approach was more advantageous when creativity was the ultimate goal. This study involved a sample composed of 34 hetrogeneous students who were members of two eighth grade crafts classes at South Junior High School in Salina, Kansas. One class, known in the research as Group I, was taught macramé by a pattern-approach to teaching macramé. A second class, known as Group II in the research, was taught the art of macramé by an approach designed to encourage creativity.

Observations were made daily by the teacher and recorded on a checklist which was devised to record the creative performance of each pupil during the time the class was working on the final and experimental piece of macramé. Each observation was designed to give information on one of the different aspects of creativity mentioned by Lowenfeld (sensitivity, fluency, flexibility, originality, reorganize, abstract, synthesize, and organize)<sup>83</sup> Checklist questions for the observer were rated as very little, little, some, much, or very much for each student in both Group I and Group II. The questions were as follow on the succeeding page.

<sup>83</sup>Lowenfeld and Brittain, op. cit., p. 7-9.

- 1. Student's own ideas were used. (originality)
- Ease of working with the chosen materials. (abstract)
- 3. Combined different types of materials (beads, other tying material, etc.) (synthesize)
- 4. Seeked to learn new knots or invented their own versions or variations of knots. (sensitivity)
- 5. Degree to which student changed and adjusted plans to solve problems. (flexibility)
- Looked for new ways to use knots as worked on final project. (reorganize)
- 7. The combinations of knots chosen fit the function of the project. (organize)
- Number of times student asked the teacher for ideas\_\_\_\_\_. (fluency)
- Length of time taken to think of the idea the student finally decided upon \_\_\_\_\_. (fluency)

A copy of the checklist form is found in Appendix A, page 60.

Student questionaire questions were used to supplement the observations of the teacher and the ratings of the three art experts. These questions were intended to record what feelings the student had as he worked on the final project in regard to the aspects of creativity.<sup>84</sup> Students rated the questions on the questionaire as very little, little, some, much, or very much. The questions were

- How much would you have liked to have had a pattern to follow? (flexibility)
- 2. How easy was it to think of ideas as you planned the final project for macramé? (fluency)
- 3. How many of the knots used are knots you made up on your own? (originality)
- 4. How many times did you follow the knots you had already learned? (flexibility)
- 5. How many new knots or new combinations of knots did you learn so they could be used in your final macramé? (sensitivity)
- 6. How much did you try to tye the knots so that new and different patterns were formed within your macramé? (sensitivity)
- 7. How many of the ideas used in your macramé were only yours? (originality)

(continued on page 25)

<sup>&</sup>lt;sup>84</sup>Lowenfeld and Brittain, loc. cit.

(continued from page 24)

- 8. How much did you attempt to rearrange the knots you had used before so they were placed differently? (reorganize)
- 9. How much were you concerned with the function of your final macramé piece when you chose the materials you used? (abstract)
- How much did you use more than one type of material in your final macramé piece (for examplebeads or wood, yarn and twine)? (synthesize)
- 11. To what extent did you combine other types of art procedures (for example: weaving) with your final macramé piece? (synthesize)
- 12. How much did you think about whether combinations of knots used fit the function of the final macramé projects? (organize)
- 13. I had \_\_\_\_\_\_ ideas of what I'd like to make with macramé and forms I'd like to use for the project. (fluency)
- 14. It took me \_\_\_\_\_ day(s) to think of the idea I used in my final macramé piece. (fluency)

A copy of the questionaire given to the students may be found in Appendix A, page 61. Also, each student was asked to produce a plan for the macramé project with the date placed on the plan. An example of a plan completed by a student can be found in Appendix C, page 72. After the macramé piece was completed the student could complete the questionaire more accurately because he/she had something to refer to for answers to some of the questions. Also, besides having a copy of the student questionaire, the questions were explained to each student in hopes of helping each subject interpret the questions correctly.

A rating scale was used by three art experts who individually checked the final macramé project of each pupil and rated each work according to the degree to which it satisfied each factor of creativity.<sup>85</sup> A plan for the macramé piece and the first attempt at macramé was included with the final work of macramé. Numbers were assigned to each student's projects to avoid favoritism in case the evaluator knew the stu-

<sup>85</sup>Lowenfeld and Brittain, loc. cit.

dent. (The group of art experts was composed of three junior high art teachers in the public schools of Salina, Kansas, who taught macramé to their pupils and also practiced macramé personally. Their names are included in the Acknowledgments, page ii.) Questions for the rating scale were rated as either very little, little, some, much, or very much for each student in both Group I and Group II. The questions were as follows:

- Degree to which the idea is new (none other has it). (originality)
- 2. Rate at which student used different patterns of knots as compared to those done in the first macramé work. (sensitivity)
- 3. Extent to which material fits intended function of the finished piece. (abstract)
- 4. Degree to which combinations of knots are used in a functional manner. (organize)
- 5. Rate at which student made use of more than one type of material (i.e.--beads or wood, yarn and twine, etc.) (synthesize)
- 6. Extent of knot combinations. (reorganize)
- 7. Degree to which student showed development of new ideas as worked on final macramé piece. (flexibility)
- Number of different knots and combinations of knots used \_\_\_\_\_. (fluency)

A sample of this rating scale may be found in Appendix A, page 63.

Because the emphasis of the research was on specific knowledge about the creativity of the subjects involved in specific classroom situations, the type of research designs used were action research techniques.<sup>86</sup> Furthermore, since the study compared the creativity of students taught macramé by a pattern-approach with the creativity of students taught macramé by an approach designed to encourage creativity, the study also employed a causal-comparative analysis<sup>87</sup> of the data.

<sup>86</sup>Walter R. Borg, <u>Educational Research: An Introduction</u>, (New York: David McKay Company, Inc., 1963), p. 313.

<sup>87</sup>Ibid., p. 263.

On the first day of the unit those students being taught macramé via patterns were shown slides of macramé by persons well-known for their work in macramé. The macramé by the teacher was also available to be touched and examined. A history of macrame was given in short lecture form and an introduction to tying knots then began. Students were given cord and instructed to cut it into the required lengths. When the cutting was accomplished students were shown enlarged diagrams of the basic knots; half knot, square knot, and the half hitch. Also they were each given handouts, examples of which can be found in Appendix B, page 65, and which included diagrams and written explanations. The overhead projector was used to show how the knots are tied. A shadow effect was achieved which showed the movements used in tying the knots and which could be copied by students as they learned the process of tying the knots. In Group I the number of knots each could tie was limited. Following the learning of the basic knots each student then learned to put knots together. All did a sampler for which the instructions can be found in Appendix B. page 69. Each student in Group I had the same pattern. The number of knots, type of knots, direction of knots was dictated and they were told what color combination to use. An example of the sampler completed by a student in Group I may be found in Appendix D, Plate I, page 74. The final project was to be experimental in design. It was to be either two-dimensional or three-dimensional and could either be functional or decorative. It was to include basic knots, experimental knots, and different types of material. Also, a different art media could be used with the macramé such as painting, weaving, etc. A plan showing what knots were going to be used, the form the macrame would take, and its function was to be given to the teacher. An example of the instructions for the plan are found in Appendix B, page <sup>70</sup> and the example of a plan completed by a student may be found in Appen-

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dix C, page 72. Examples of some of the final macramé projects from Group I may be found in Appendix D, Plates II and III, pages 75 and 76.

Students of Group II were introduced to macramé in the same manner as were the students of Group I until the point of actually beginning to tie the knots. Instead of being limited on the number of knots they could tie, the students were instructed to tie each basic knot until they knew how to tie that particular knot. After learning the basic knots they were to then tie knots which they had made up on their own and to experiment with combining knots. They were challenged to think about what would happen if...? Each student was then asked to make a small project which would be two- or three-dimensional. The form was to be different from everyone elses. They were to use knots they had learned, make up some of their own and experiment with adding materials. Ideas for forms were to come from nature, or...? Slides of macrame done by well-known artists in this field were again shown to students to point out sources of ideas so that the students might look in similar places for ideas for their personal macramé projects. In Appendix D. Plate IV, page 77, examples of samplers completed by Group II students can be found. As in Group I the final project for Group II was to be experimental including basic knots, experimental knots, different types of material, and different art media could also be combined with the macrame such as painting, weaving, etc. A plan showing what knots were going to be used, the form the macrame would take, and its function was to be given to the teacher. The instructions for making the plan may be found in Appendix B, page 70 and in Appendix C, page 72, one will find an example of a plan by a student. Some of the final projects from Group II are to be found in Appendix D, Plates V, VI, VII, pages 78-80.
dix C, page 72. Examples of some of the final macramé projects from Group I may be found in Appendix D, Plates II and III, pages 75 and 76.

Students of Group II were introduced to macramé in the same manner as were the students of Group I until the point of actually beginning to tie the knots. Instead of being limited on the number of knots they could tie, the students were instructed to tie each basic knot until they knew how to tie that particular knot. After learning the basic knots they were to then tie knots which they had made up on their own and to experiment with combining knots. They were challenged to think about what would happen if...? Each student was then asked to make a small project which would be two- or three-dimensional. The form was to be different from everyone elses. They were to use knots they had learned, make up some of their own and experiment with adding materials. Ideas for forms were to come from nature, or...? Slides of macramé done by well-known artists in this field were again shown to students to point out sources of ideas so that the students might look in similar places for ideas for their personal macramé projects. In Appendix D, Plate IV, page 77, examples of samplers completed by Group II students can be found. As in Group I the final project for Group II was to be experimental including basic knots. experimental knots, different types of material, and different art media could also be combined with the macramé such as painting, weaving, etc. A plan showing what knots were going to be used, the form the macrame would take, and its function was to be given to the teacher. The instructions for making the plan may be found in Appendix B. page 70 and in Appendix C, page 72, one will find an example of a plan by a student. Some of the final projects from Group II are to be found in Appendix D, Plates V, VI, VII, pages 78-80.

As the students worked on their final projects the teacher checklist for both Group I and II was filled out daily. Following the completion of the final project each student was asked to complete the student questionaire. Along with the final project, the small project and the plan for the final project were given to the three art experts who separately rated the students' work.

All of the data from observation forms, student questionaires, and the rating scales were compiled and presented in tables. The onetailed t-test<sup>88</sup> was used to determine the significance of the differences between the means of the two groups on each question.

<sup>&</sup>lt;sup>88</sup>Floyd L. Ruch and Neil D. Warren, <u>Elementary Statistics in</u> <u>Psychology and Education</u>, (Columbia, Missouri: Lucas Brothers, 1957), p. 90.

#### CHAPTER IV

#### ANALYSIS OF DATA

Because a difference was recorded between two uncorrelated means, a one-tailed t-test designed for this type of problem was used to determine whether the difference referred to could be termed a significant one.<sup>89</sup> A description of the instrument to test the data, an examination of the tabulated results of the computations and a report of the examination of the hypothesis of this research can be found in this chapter.

# Description of the Instrument

The t-test used by the investigator involved the formulation of the null hypothesis and the testing of the differences between the means of Group I and Group II: "In order to interpret the significance of a t-ratio, we must know not only the value of t but also the number of degrees of freedom is a value which takes into account the sample size in interpreting the significance of a t-ratio."<sup>90</sup> It must be assumed that the standard deviations were equal for the two populations from which the samples were chosen. If the value of t is found to fall within the range of 1.645, the null hypothesis should be accepted. If the difference between the two group means result in a t-score which is outside the range of 1.645 then one group mean was obviously significantly larger than the other group mean and it can be concluded that the expectations were false.

<sup>89</sup>Ibid., p. 90. <sup>90</sup>Ibid., p. 87.

thus, the null hypothesis would be rejected. Symbolically, this is Written as:

$$t = \sqrt{\frac{M_1 - M_2}{\left(\frac{\xi x_1^2 + \xi x_2^2}{N_1 + N_2 - 2}\right)\left(\frac{N_1 + N_2}{N_1 N_2}\right)}$$

where  $(M_1)$  is the mean of Group I,  $(M_2)$  is the mean of Group II,  $(\leq x_1^2)$  is the sum of squared deviation scores for Group I,  $(\leq x_2^2)$  refers to the sum of squared deviation scores for Group II,  $(N_1)$  is the number of cases in Group I, and  $(N_2)$  is the number of cases in Group II. For this test, the number of degrees of freedom is  $(N_1 + N_2 - 2)$ .

Before stating the calculations for this test, a table for each question was needed. The procedure for establishing this table was by (1) placing the ungrouped raw scores in column 1, (2) tabulating the raw scores in column 1 and recording the total, (3) finding the mean of the ungrouped raw scores, (4) computing the deviation score for each raw score and entering the values in column 2, (5) squaring each deviation score and entering the values in column 3 and (6) summing the squared deviations to obtain the sum of the squared deviations and placing the value at the bottom of column 3. An example of this table may be found in Appendix E, page 82. A table of this type was established for each group in regards to each question.

For the purpose of reporting data and results the researcher used the following tables: Table I was reporting data received from questions on flexibility, Table II was reporting on originality data, Table III was concerned with questions on sensitivity, Table IV represented data received from questions on the abstract aspect, Table V dealt with data from questions on synthesize. Table VI was concerned with fluency data, Table VII referred to the data received from questions on the reorganize aspect, and Table VIII represented data from questions dealing with the aspect of organize. Tables I through VIII may be found on pages 33 through 49. The results the tables contain are discussed in detail on the pages mentioned.

# Test of the Major Hypothesis

In this research .05 was set as the level of significance. This implied that there was less than five chances per one hundred cases of obtaining by chance such a distribution. For the number of degrees of freedom used for each question in this research the critical value remains at 1.645, according to the t-distribution table.<sup>91</sup>

The null hypothesis was stated as: there is no significant difference in the creative performance in macramé projects of pupils having been taught the art of macramé by an approach designed to encourage creativity and of pupils having been taught the art by a pattern-approach. Symbolically, this is:  $H_0 p \leq .05$ .

Results were calculated by the researcher from tables such as the one found in Appendix E, page 82. t was then calculated by (1) subtracting the mean of Group I (M<sub>1</sub>) and the mean of Group II (M<sub>2</sub>); (2) adding the sum of the squared deviation scores for Group I ( $\Sigma x_1^2$ ) to the sum of the squared deviation scores for Group II ( $\Sigma x_2^2$ ); (3) adding together the number of cases in Group I (N<sub>1</sub>) and Group II (N<sub>2</sub>) and subtracting 2 from that total; (4) dividing the total of step 2 ( $\Sigma x_1^2 + \Sigma x_2^2$ ) by the total of step 3 (N<sub>1</sub> + N<sub>2</sub> - 2) (5) adding together the number of cases in Group I (N<sub>1</sub>) and Group II (N<sub>2</sub>); (7) dividing the total of step 5 (N<sub>1</sub> + N<sub>2</sub>) by the product of step 6 (N<sub>1</sub>N<sub>2</sub>);

<sup>91</sup>Ibid., p. 89.

(8) multiplying the quotient of step 4 and the quotient of step 7; (9) finding the square root of the product of step 8; and (10) dividing step 1 by step 9. Symbolically this is:

$$\sqrt{\frac{\mathbf{\Sigma}\mathbf{x}_{1}^{2} + \mathbf{\Sigma}\mathbf{x}_{2}^{2}}{\frac{\mathbf{N}_{1} + \mathbf{N}_{2} - 2}} \left(\frac{\mathbf{N}_{1} + \mathbf{N}_{2}}{\frac{\mathbf{N}_{1}\mathbf{N}_{2}}{\mathbf{N}_{1}\mathbf{N}_{2}}}\right)}$$

# TABLE I

# ASPECT OF CREATIVITY-FLEXIBILITY

Question	Group	Means		Significant or
Number	I	II	<u>t-value</u>	Not Significant
Student Question- naire Question-1	2.1	1.8	.866	not significant
Student Question- naire Question-4	4.0	3.6	1.033	not significant
Teacher Check- list Question-5	2.7	3.9	4.900	* significent
Three Art Experts Rating Scale Question-7	3.3	4.4	4.920	* significant

Note: \*signifies that the t-value is significant at the .01 level.

The following are the calculations and the results that were obtained for t for flexibility:

# Student Questionaire-1

$M_1 = 2.1$ $M_2 = 1.8$	$\sum \frac{2}{x_2^2} = 19.16$
$\Sigma \mathbf{x}_1^2 = 13.35$	$N_1 = 15$ $N_2 = 19$
.3	= <u>.3</u> = .866 .3464
V(1.02) (.12)	

The result .866 lies below the .05 level of significance so the null hypothesis must be accepted. The computation indicates that the students in Group I and Group II were not significantly different when asked how much they would have liked to have had a pattern to follow.

# Student Questionaire-4

The result 1.033 lies below the critical value of 1.645 so, again, the null hypothesis must be accepted. The two groups indicate that there was no significant difference between the amount members of each group followed the knots which had already been learned.

# Teacher Checklist-5

The above calculation, 4.900, is well above the 1.645 needed to reject the

null hypothesis. Thus, it can be said that Group II shows a significantly greater amount of change and adjustment of plans to solve problems which arose during the completion of the final project than does Group I.

# 

The above result, 4.920, is large enough to reject the null hypothesis and to indicate that Group II shows a significantly greater degree of development of new ideas in the final macramé projects than does Group I.

Results from Table I indicate that the feelings of the students in relation to the flexibility aspect of creativity show no significant difference between the groups. However; the teacher and three art experts indicated Group II as having showed significantly greater flexibility than Group I

# TABLE II

Question Number	Group Means I II		<u>t-value</u>	Significant or Not Significant	
Student Question- naire Question-3	2.1	2.1	0	not significant	
Student Question- naire Question-8	2.7	3.2	1.066	not significant	
Teacher Check- list Question-1	3.1	4.2	3.890	* significant	
Three Art Experts Rating Scale Question-1	3.4	4.1	3.131	* significant	

#### ASPECT OF CREATIVITY-ORIGINALITY

Note: \*signifies that the t-value is significant at the .01 level.

Following are the calculations and the results that were obtained for t for originality:

# Student Questionaire-3

The O value of t indicates that for this particular question the Group I and II students show no significant difference in the amount of knots they felt had been made up on their own. Thus, the null hypothesis must be accepted.

The results, 1.066, are not great enough to reject the null hypothesis, so, it must be accepted. Again, the students of Group I and Group II show no significant difference between the amount of ideas they had used which were only their own.

 $\frac{\text{Teacher Checklist-1}}{M_1 = 3.1}$   $M_2 = 4.2$   $\sum_{x_1^2} = 14.95$   $M_1 = 15$   $N_2 = 19$   $\frac{1.1}{\sqrt{(.69)} (.12)} = \frac{1.1}{.2828} = 3.890$ 

The above computation, 3.890, indicates a significant difference between Group I and Group II in relation to what extent the students used their own ideas. The results indicate that students of Group II used a significantly greater amount of their own ideas than did Group I. Thus, the null hypothesis is rejected.



The result is 3. 131 which is great enough to reject the null hypothesis. In this question Group II is shown to have a significantly greater amount of new ideas than did Group I.

The computations show that the students' feelings in student questionaire questions 3 and 8 supported the null hypothesis. The results for questions from the teacher checklist and the three art experts' rating scale indicate that Group II showed a significantly greater amount of originality than did Group I, thus, rejecting the null hypothesis.

#### TABLE III

Question Number	Group Means I II		t-value	Significant or Not Significant
Student Question-				
Student Question-5	2.3	3.1	2.412	* significant
naire Question-6	2.9	2.6	. 707	not significant
list Question-4	2.1	3.2	3.890	* significant
Three Art Experts Rating Scale Question-2	3.2	4.1	3.675	* significant

# ASPECT OF CREATIVITY-SENSITIVITY

Note: \*signifies that the t-value is significant at the .01 level.

Calculations and results for t for questions on sensitivity are as follows:

# Student Questionaire-5

$M_1 = 2.3$ $M_2 = 3.1$	$\mathcal{Z}_{x_2^2} = 18.99$
$\xi_{x_1}^2 = 10.53$	$N_1 = 15$ $N_2 = 19$
.8	= = 2.412
$\sqrt{(.92)}$ (.12)	.3317

The calculations show the result 2.412 which indicates that students in Group II felt that they had learned a significantly greater amount of new knots or new combination of knots for use in their final macramé than did students in Group I. The null hypothesis, thus, may be rejected. Student Questionaire-6  $M_1 = 2.9$   $M_2 = 2.6$   $\sum_{n_1}^{2} x_1^2 = 19.20$   $\sum_{n_1}^{2} x_1^2 = 19.20$   $M_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 19$   $N_2 = 19$   $N_1 = 15$   $N_2 = 10$   $N_2 = 10$   $N_1 = 15$   $N_2 = 10$   $N_1 = 10$   $N_2 = 10$   $N_2 = 10$   $N_1 = 10$   $N_2 = 10$   $N_1 = 10$   $N_2 = 10$   $N_1 = 10$   $N_2 = 10$  $N_2$ 

The results, .707, indicate that the difference between the amount of time the students in Group I and II spent tying knots so that new and different patterns were formed in their macramé was not significant. Therefore, the null hypothesis must be accepted in this case.

# Teacher Checklist-4

The calculations show the result to be 3.890 which indicates that students in Group II seeked to learn new knots or invented their own version or variations of knots to a significantly greater extent than did students in Group I. These results allow the null hypothesis to be rejected.

# Three Art Experts-2

The result is 3.675 which allows rejection of the null hypothesis. The result indicated that the students in Group II used different patterns of

knots in the final macramé than were used in the first macramé at a larger rate than did students in Group I.

For originality, results shown in Table III show one question from students which indicated acceptance of the null hypothesis; however, the students, the teacher, and the three art experts, in a question apiece, rated Group II as showing a significantly greater amount of sensitivity than Group I in the remaining questions for this aspect of creativity. This called for the rejection of the null hypothesis.

#### TABLE IV

Question Number	<u>Group</u> I	Means II	<u>t-value</u>	<u>Significant</u> or Not Significant
Student Quest- ionnaire Ques- tion-9	3.3	3.4	.236	not significant
Teacher Check- list Question-2	2.9	3.7	3.023	* significant
Teacher Check- list Question-7	3.8	4.3	2.887	* significant
Three Art Ex- perts Rating Scale Question- 3	3.7	4.4	4.042	* significant

#### ASPECT OF CREATIVITY-ABSTRACT

Note: \*signifies that the t-value is significant at the .01 level.

The calculations and results obtained for t in questions for abstract follow:

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Student Questionaire-9  $M_1 = 3.3$   $M_2 = 3.4$   $\Sigma x_1^2 = 20.55$   $\sum_{n_1}^{n_1} = 15$   $N_2 = 19$  $\frac{1}{\sqrt{(1.47)(.12)}} = \frac{.1}{.4243} = .236$ 

The result of the calculation is .236 which requires acceptance of the null hypothesis. Students in Group I and Group II indicate no significant differences between them in the amount of consideration they had given to the relationship between the type of material they used and the function of the final macramé.

 $\frac{\text{Teacher Checklist-2}}{M_1 = 2.9} \qquad \qquad \begin{array}{c} & & & & & \\ M_2 = 3.7 & & & & & \\ N_1 = 15 & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ \hline \end{array} \begin{array}{c} & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ \hline \end{array} \begin{array}{c} & & & \\ & &$ 

The result being 3.023 the null hypothesis must be rejected. The result indicates that Group II showed a significantly greater amount of ease in working with the materials chosen than did Group I.

Teacher Checklist-7

$M_1 = 3.8$ $M_2 = 4.3$	$\Sigma x_2^2 = 3.71$
$\xi x_1^2 = 3.00$	$N_1 = 15$ $N_2 = 19$
.5	= .5 = 2.887
√ (.21) (.12)	.1/32

Because the result is 2.887 the null hypothesis is rejected. The result signifies the fact that Group II chose combinations of knots which fit the function of the project to a significantly greater extent than did Group I. Student Questionaire-9

The result of the calculation is .236 which requires acceptance of the null hypothesis. Students in Group I and Group II indicate no significant differences between them in the amount of consideration they had given to the relationship between the type of material they used and the function of the final macramé.

 $\frac{\text{Teacher Checklist-2}}{M_1 = 2.9} \qquad \qquad \underbrace{\sum x_2^2 = 12.11}_{N_1 = 15} \\ \sum x_1^2 = 7.75 \qquad \qquad N_2 = 19 \\ \frac{.8}{\sqrt{(.62) (.12)}} = \frac{.8}{.2646} = 3.023$ 

The result being 3.023 the null hypothesis must be rejected. The result indicates that Group II showed a significantly greater amount of ease in working with the materials chosen than did Group I.

# Teacher Checklist-7

$M_1 = 3.8$ $M_2 = 4.3$	$\Sigma x_2^2 = 3.71$
$\xi x_1^2 = 3.00$	$\begin{array}{rcl} N_1 &=& 15\\ N_2 &=& 19 \end{array}$
$\frac{.5}{\sqrt{(.21)(.12)}}$	= <u>.5</u> = 2.887 .1732

Because the result is 2.887 the null hypothesis is rejected. The result signifies the fact that Group II chose combinations of knots which fit the function of the project to a significantly greater extent than did Group I.



The result, 4.042, indicates that the finished macramé of the students in Group II used materials which fit the intended function of the piece to a significantly greater extent than did the macramé of students in Group I. Thus, the null hypothesis is rejected.

According to computational results recorded in Table IV the student questionaire questions show support for the null hypothesis. However, results tabulated for the teacher checklist questions and the question from the three art experts' wating scale indicate that the null hypothesis must be rejected.

#### TABLE V

Question Number	Group I	Means II	<u>t-value</u>	<u>Significant</u> of Not Significant
Student Question- naire Question-10	1.8	3.7	6.333	* significant
Student Question- naire Question-11	1.7	2.5	2.309	** significant
Teacher Check- list Question-3	1.9	2.3	.970	not significant
Three Art Experts Rating Scale Question-5	1.8	4.0	8.983	* significant

#### ASPECT OF CREATIVITY-SYNTHESIZE

Note: \* signifies that the t-value is significant at the .01 level. \*\* signifies that the t-value is significant at the .05 level. The computations and results of the value of t for synthesize are as follows:

#### Student Questionaire-10

The result of the calculation, 6.333, indicates that students in Group II felt that they had used more than one type of material in their final maccramé piece to a significantly greater extent than had students in Group I. Because of the results, the null hypothesis is rejected.

# Student Questionaire-11

The result is 2.309 which shows Group II as having combined other types of art procedures with the final macramé piece to a significantly greater extent than had Group I. Thus, the null hypothesis must be rejected.

Teacher Checklist-3

$M_1 = 1.9$ $M_2 = 2.3$	$\mathcal{Z}_{x_2^2} = 28.11$
$\Sigma x_1^2 = 17.75$	$N_1 = 15$ $N_2 = 19$
.4	_ =4 = .970
√ (1.43) (.12	.4123

The result is .970 which shows no significant difference between Group I and Group II in relation to the extent which different types of materials were combined. Thus, the results require that the null hypothesis be accepted.



The result of the computation is 8. 983 which indicates that Group II used, at a significantly greater rate than Group I, more than one type of material. Because of this result the null hypothesis is rejected.

Student questionaire questions and the three art experts question indicate a rejection of the null hypothesis for synthesize. The results from the teacher checklist question show support for the null hypotheis.

## TABLE VI

Quedition	Grow	Group Means		Significant or	
Number	I	II	<u>t-value</u>	Not Significant	
Student Question- naire Question-2	3.3	3.6	.832	not significant	
Student Question- naire Question-13	3.5	3.9	.676	not significant	
Student Question- naire Question-14	1.7	1.6	.289	not significant	
Teacher Check- list Question-8	1.3	1.0	.949	not significant	
Teacher Check- list Question-9	1.4	1.1	2.122	** significant	
Three Art <b>Expe</b> rts Rating Scale-8	2.4	5.2	11.433	* significant	

#### ASPECT OF CREATIVITY-FLUENCY

Note: \*signifies that the t-value is significant at the .01 level. \*\*signifies that the t-value is significant at the .05 level. For fluency the computations and results for t follow:

# Student Questionaire-2

The result, .832, indicates that the students in Groups I and II showed no significant difference in the ease they had in thinking of ideas as they planned the final macramé project. Therefore, the null hypothesis must be accepted.

#### Student Questionaire-13

The computational result, .676, shows that the students in Groups I and II indicated no significant difference between them in the number of ideas they had of what they'd like to make with macrame and the forms that the object could take. Thus, the null hypothesis must be accepted.

# Student Questionaire-14

The result is .289 and indicates that students in Groups I and II showed no significant difference in the number of days it took them to think of the idea they had used in their final macramé piece. The null hypothesis, then, must be accepted.

#### Teacher Checklist-8

$$M_{1} = 1.3 \qquad \qquad \sum_{n_{2}} 2 = 8.00 \qquad \qquad M_{1} = 1.5 \qquad \qquad \sum_{n_{2}} 2 = 8.00 \qquad \qquad M_{1} = 15 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{2} = 19 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M_{2} = 19 \qquad \qquad M_{1} = 15 \qquad \qquad M$$

The result of .949 is not significant and indicates that the null hypothesis must be accepted. The result shows that the differences between the number of times students in Groups I and II asked the teacher for ideas were insignificant.

Teacher Checklist-9

$$M_{1} = 1.4 \qquad \qquad \sum x_{2}^{2} = .99$$

$$M_{2} = 1.1 \qquad \qquad N_{1} = 15 \qquad \qquad N_{2} = 19$$

$$\frac{.3}{\sqrt{(.14)(.12)}} = \frac{.3}{.1414} = 2.122$$

The result, 2.122, indicates that there was a significant difference between the length of time students in Groups I and II used to think of the idea which they decided to use for their final macrame. Group II is shown as having taken less time than Group I. Thus, the null hypothesis must be rejected.

#### Three Art Experts-8

Since the result of 11.433 is much greater than 1.645, It gives support

for rejection of the null hypothesis. The result indicates that Group II used a significantly larger number of different knots and combinations of knots than Group I.

The results for fluency show all three student questionaire questions and one teacher checklist question supporting the null hypothesis while Teacher Checklist Question 11 and the Three Art Experts' Rating Scale Question 8 indicated that Group II was significantly more fluent than Group I, thus the null hypothesis would be rejected for those two questions.

#### TABLE VII

Question Number	<u>Group</u> I	Means II	<u>t-value</u>	<u>Significant</u> or Not Significant
Student Question- naire Question-7	3.8	3.5	.655	not significant
Teacher Check- list Question-6	2.5	3.8	4.597	* significant
Three Art Experts Rating Scale Question-6	3.1	4.2	4.919	* significant

#### ASPECT OF CREATIVITY-REORGANIZE

<u>Note</u>: \*signifies that the t-value is significant at the .01 level. The computations and results for t as found for the creativity aspect, reorganize are as follows:  $\frac{\text{Student Questionaire-8}}{\sum_{1}^{N_{1}} = 3.8} \qquad \qquad \sum_{2}^{N_{2}} = 38.75$   $M_{2} = 3.5 \qquad \qquad N_{1} = 15$   $\sum_{1}^{N_{1}} = 16.40 \qquad \qquad N_{2} = 19$   $\frac{3}{\sqrt{(1.72)(.12)}} = \frac{3}{.4583} = .655$ 

The result of .655 indicates that students in Groups I and II show no significance in the difference between how many of them felt they had attempted to rearrange knots they had used before so they were placed differently. Therefore, the null hypothesis must be accepted.

Teacher Checklist-6

Since the result is 4.597 it can be said that students in Group II looked for new ways to use knots as they worked on the final project to a significantly greater extent than the students in Group I. Thus, the null hypothesis must be rejected.

Three Art Experts-6

The result of 4.919, shows that the null hypothesis may be rejected. It indicates that projects of Group II students showed a significantly greater amount of rearrangement of knot combinations than did projects of Group I students. For the creativity aspect, reorganize, Table VII indicates that the student questionaire question showed results which gave support to the null hypothesis. But, the two questions from the teacher checklist and the three art experts' rating scale indicate that Group II students had shown more ability to reorganize in their final macramé projects than had Group I students.

#### TABLE VIII

Question Number	Group Means I II		<u>t-value</u>	Significant or Not Significant		
Student Question- naire Question-12	3.3	3.1	.667	not significant		
Teacher Check- list Question-7	3.9	4.3	2.000	** significant		
Three Art Experts Rating Scale Question-4	3.6	4.4	4.624	* significant		

# ASPECT OF CREATIVITY-ORGANIZE

Note: \*signifies that the t-value is significant at the .01 level. \*\*signifies that the t-value is significant at the .05 level.

The following computations and results are for the value of t in the aspect of creativity, organize:

Because the result is .667 the null hypothesis must be accepted. The result indicates that students in Groups I and II showed no significant

differences in how much they thought about whether the combinations of knots they were using fit the function of the final project.

#### Teacher Checklist-7

The result of 2.000 indicates that Group II students chose combinations of knots which fit the function of the project to a significantly greater extent than did Group I students. Thus, the null hypothesis is rejected.

#### Three Art Experts-4

The result of the computation is 4.624 which indicates that the null hypothesis must be rejected. It shows that the degree to which combinations of knots were used in a functional manner was greater in Group II projects than in Group I projects.

The null hypothesis was accepted by results taken from the student questionaire question. The results of questions from the teacher checklist and the three art experts' rating scale reject the null hypothesis and show Group II students as superior to the Group I students in the creative aspect, organize.

The support (below the 1.645 significant level on the t-scale) or rejection (above the 1.645 significant level on the t-scale) of the null

hypothesis may be quickly seen in relation to results from the Student Questionaire, the Teacher Checklist, and the Three Art Experts' Rating Scale by reading Table IX.

# TABLE IX

SUPPORT OR REJECTION OF THE NULL HYPOTHESIS

Questions	<u>Support of</u> Null Hypothesis	Rejection of Null Hypothesis		
Student Questionnaire	11	3		
Teacher Checklist	2	7		
Three Art Experts Rating Scale	0	8		
Total Number of Questions Supporting The Null Hypothesis	13	Total Number of Questions Reject- ing the Null Hy- pothesis 18		

Because 18 of 31 calculated numbers of the t-test for measuring the differences between two uncorrelated means for Group I and Group II were significantly above the 1.645 required to reject the null hypothesis, the null hypothesis is rejected. The accepted alternative hypothesis is: The creative performance in macramé projects of pupils having been taught the art of macramé by an approach designed to encourage creativity will be significantly greater than the creative performance of pupils having been taught the art by a pattern-approach.

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#### CHAPTER V

# CONCLUSIONS, FACTORS, AND RECOMMENDATIONS

# Review of the Study

The main purpose of this study was to determine whether there was a significant difference between the creative performances in macramé projects completed by eighth grade craft students who were introduced to the art through the pattern-approach and the creative performances in macramé projects completed by eighth grade craft students who were introduced to the art through a creative-approach.

Daily observations were made by the teacher and observations were recorded on a checklist. Each item on the checklist was designed to give information on the following different aspects of creativity: sensitivity, fluency, flexibility, organize, reorganize, synthesize, abstract, and originality. Following the completion of the macrame project each student was given a questionaire to complete. The questionaire included questions which were designed to give data for the aspects of creativity. A panel of three junior high art teachers (who taught the art of macramé to their students and practiced macramé) also completed, individually, a rating scale of which the questions were to return infomation dealing with the eight aspects of creativity.

#### Conclusions

Based upon the statistical analysis collected in the research, the following conclusions may be drawn: (Plates I through VII in Appendix D, pages 74 through 80 may be referred to as the conclusions are read.) 1. Results computed from data on the creativity aspects: sensitivity, abstract, synthesize, reorganize, and organize indicated that a student taught macramé by an approach designed to promote creativity would perform at a higher rate in these factors of creativity than would the student taught the art by a pattern-approach.

2. Data on the creativity aspects: flexibility, originality, and fluency gave computational results which strongly indicated the possibility of creativity being present for these aspects even when persons were taught by a pattern-approach.

3. The findings cannot be said to conclusively support the accepted hypothesis which states that the creative performance in macramé projects of pupils having been taught the art of macramé by an approach designed to encourage creativity will be significantly greater than the creative performance in macramé projects of pupils having been taught the art by a pattern-approach. Because eighteen of thirty-one questions show results favoring the creative approach it is suggested that creativity is more likely to be found when teaching for creativity exists, but since thirteen of the thirty-one questions showed insignificant differences in the creative performance of students taught by the experimental and control approaches, it does not rule out the possibility of the existence of creativity when a child learns macramé by a pattern-approach. However, because the majority of the results favored the creative approach there was an indication that the liklihood of creativity existing is minimized when the pattern-approach is used.

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## Factors That Seemed To

#### Affect the Study

The researcher felt that several of the following factors may have affected the study and therefore caused the results to vary.

1. Results from the teacher checklist and the three art experts generally agreed that the creative-approach produced a significantly more creative performance than did the pattern-approach. However, in eleven of fourteen student questionaire questions the results were insignificant. Several reasons may have caused this wide variance: a) perhaps the students feared overrating themselves, b) some students may have overrated themselves to save face, or c) the questions may not have been fully understood by some students despite efforts by the investigator (outlined earlier in the study) to avoid any misunderstanding.

2. The study did not last for a long enough period to produce a real change in the creativity of any student so the results would be affected by the amount of functional creativity the students already possessed. (The researcher felt that a time period equal to a semester would produce more significant results.)

#### Recommendations for Future Study

Future studies resulting from this investigation might:

 study the possibility of a correlation between self-concept and creativity in individuals,

2. study the possible advantages of teaching all subjects with a creative approach striving to satisfy needs for nurturing creativity as well as meeting expected knowledge and skill levels for that subject,

3. investigate the possibility of the obtainment of a broader knowledge and skill area for a subject when teaching for creativity,

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4. study the feasibility of developing an in-service workshop to show teachers in the field how to design and teach units with goals for the teaching of creativity as well as for the satisfaction of expected knowledge and skill levels,

5. implement a similar study for a longer period of time (for example-a semester period) to determine if more significant differences appear between students taught by pattern-teaching and students taught to be creative and then, perhaps, make a speculation of the effects of a long-term exposure to pattern teaching, or

6. research the possibility of a correlation between the amount of creativity a person is recognized by others to have shown in a creative endeavor and the amount of creativity that he allows himself to recognize. This could progress into a study of the possibility that a person accepts or denies the presence of creativity within himself at certain ages and a determination could be made of why this occurs, if, indeed, it does.

#### **BIBLIOGRAPHY**

#### A. PRIMARY SOURCES

Ackerman, LeJeune Whitney, <u>Macramé, A New Look At An Ancient Art</u>, Sunnyvale, California: LeJeune, Incorporated, 1971.

Andes, Eugene, <u>Practical Macramé</u>, New York: Van Nostrand Reinhold Company, 1971.

Borg, Walter R., <u>Educational Research: An Introduction</u>, New York: David McKay Company, Inc., 1963.

Bryson, L., "Training for Creativity", <u>School Arts</u>, 60: 5-8, September, 1960.

Guilford, J. P., "Factors That Aid and Hinder Creativity", <u>Creativity:</u> <u>Its Educational Implications</u>, by John C. Gowan and others, New York: John Wiley and Sons, 1967.

Hallman, Ralph J., "The Necessary and Sufficient Conditions of Creativity", <u>Creativity: Its Educational Implications</u>, by John C. Gowan and others, New York: John Wiley and Sons, 1967.

Harvey, Virginia Isham, "Macramé, Knotting Can Add Pattern", <u>Handweaver</u> and <u>Craftsman</u>, Summer, 1967, pp 13-17.

Harvey, Virginia Isham, "Macramé, Ideal for Finishing Edges", <u>Handweaver</u> and <u>Craftsman</u>, Summer, 1967, pp 15-17.

Harvey, Virginia Isham, <u>Macramé: The Art of Creative Knotting</u>, New York: Van Nostrand Reinhold Company, 1967.

Lowenfeld, Victor, "Creativity and Art Education", School Arts, 59: 5-15.

Lowenfeld, Victor and W. Lambert Brittain, <u>Creative and Mental Growth</u>, Fourth edition, New York: The Macmillan Co., 1964.

McFee, June King, <u>Preparation For Art</u>, San Francisco: Wadsworth Publishing Company, Inc., 1961.

Meilach, Dona Z., <u>Macramé: Crestive Design in Knotting</u>, New York: Van Nostrand Reinhold Company, 1971.

Owen, Cramer, "An Investigation of Creative Potential At The Junior High Level", <u>Studies in Art Education</u>, 3: 16-33, Spring, 1962.

Parnes, Sidney J., "Can Creativity Be Increased?", <u>Studies in Art Education</u>, 1: 39-46, Fall, 1961. Phillips, Mary Walker, "Macramé", Design, Winter, 1970, pp 34-37.

Phillips, Mary Walker, Step-By-Step Macramé, New York: Golden Press, 1970.

Ruch, Floyd L. and Neil D. Warren, <u>Elementary Statistics in Psychology</u> and <u>Education</u>, Colombia, Missouri: Lucas Brothers, 1957.

Short, Eirian, <u>Introducing Macrame</u>, New York: Watson-Guptill Publications, 1970.

Singleton, Mary F., William J. Singleton, Batty J. Weber, and P. Wes Weber, Simply Macramé, An Introduction To An Exciting New Craft, Berkeley, California: Webton Enterprises, 1971.

Stewart, Evelyn Stiles, <u>The Right Way To Macramé, A Macra-Manual For</u> <u>Basic Knots</u>, Columbus, Ohio: Knit Services, Inc., 1971.

Stone, Candace and Nancy Terman, <u>Advanced Macramé</u>, Stone Mountain, Georgia: Cunningham Art Products, Inc., 1972.

Stone, Candace and Nancy Terman, <u>Macramé, Knotting Your Own Personal</u> <u>And Decorative Acessories</u>, Stone Mountain, Georgia: Cunningham Art Products, Inc., 1971.

Torrance, E. Paul, "Creative Teaching Makes A Difference," <u>Creativity:</u> <u>Its Educational Implications</u>, compiled by John C. Gowan and others, New York: John Wiley and Sons, 1967.

Znamierowski, Nell, "Spencer Depas and Knotting", Craft Horizons, March/ April, 1965, pp 32-33, 51.

#### **B. SECONDARY SOURCES**

"Cord + Knots Make Macramé", Woman's Day, July 1969, pp 40-43.

"Creative Textile Design", American Home, May, 1968, pp 40.

Halstead, Whitney, "Claire Zeisler and the Sculptured Knot", <u>Craft Horizon</u>, September, 1968, pp 10-15.

Harding, Deborah and Patricia Curtis, "Macramé", Family Circle, May, 1971, pp 56-59.

"How to Make Macramé", <u>House and Garden</u>, February, 1967, pp 140-141, 166-167.

Hubbard, Guy, Art In The High School, Belmont, California: Wadsworth Publishing Company, Inc., 1967.

Keiler, ManfredL., <u>The Art In Teaching Art</u>, Lincoln: University of Nebraska Press, 1961.

"Knotty But Nice", Time, May 17, 1971, pp 50.

Krippner, Stanley, 'The Ten Commandments That Block Creativity', <u>Education</u> <u>Digest</u>, 33: 23-26, January, 1968.

MacKinnon, Donald W., "Identifying and Developing Creativity", <u>Creativity:</u> <u>Its Educational Implications</u>, compiled by John C. Gowan and others, New York: John Wiley and Sons, Inc., 1967.

"Macramé Ties Country in Knots", McCalls, April, 1971, pp 43.

"Make Your Own Jewelry", Redbook, May, 1971, pp 69-71, 84-85.

Schwartz, Fred, "Glen Kaufman", Crafts Horizon, January, 1967, pp 14-16.

Smith, Morley B., "Macramé-Not as Knotty as It Looks", <u>Better Homes and</u> <u>Gardens</u>, February, 1971, pp 60-61, 80-85, 107.

The Dictionary of Macramé Knots, U. S. A. : Fawcett Publications, Inc., 1969.

<u>Twelve Belt and Bag Macrame Designs</u>, Temple City, California: Craft Cource Publishers, 1971.

Williams, Hazel Pearson, craft consultant, <u>Macramé, Start to Finish</u>, Temple City, Clifornia: Craft Course Publishers, Incorp., 1971. APPENDIX A

EXAMPLES OF METHODS OF COLLECTING DATA

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# Checklist--(Questions for Observer)

		very little	little	some	much	very much
1.	Students own ideas were used					
2.	Ease of working with chosen materials					
3.	Combined different types of materials (beads, other tying material, <b>e</b> tc					
4.	Seeked to learn new knots or invented their own versions or variations of knots					
5.	Degree to which student changed and adjusted plans to solve problems.					
6.	Looked for mew ways to use knots as worked on final project					
7.	The combinations of knots chosen fit the function of the project					

8. Number of times student asked the teacher for ideas\_\_\_\_\_.

9. Length of time taken to think of idea student finally decided

upon\_\_\_\_\_.

#### Student Questionaire

1.	How much would you have liked to have had a pattern to follow?	Very Little	Little	Some	Much	Very Much
2.	How easy was it to think of ideas as you planned the final project for macramé?					
3.	How many of the knots used are knots you made up on your own?					
4.	How many times did you follow the knots you had already learned?					
5.	How many new knots or new combina- tions of knots did you learn so they could be used for your final macramé?					
6.	How much did you try to tye the knots so that new and different patterns were formed within your macramé?					
7.	How many of the ideas used in your macramé were only yours?					
8.	How much did you attempt to rearrange the knots you had used before so they were placed differently?					
9.	How much were you concerned with the function of your final macramé piece when you chose the materials you used?					

# Student Questionaire (continued)

10.	How much did you use more than one type of material in your final macramé piece (for example- beads or wood, yarn and twine)?	Very Much	Little	Some	Much	Very Much
11.	To what extent did you combine other types of art procedures (for example: weaving) with your final macramé piece?					
12.	How much did you think about whether combinations of knots used fit the function of the final macramé projects?					

- 13. I had\_\_\_\_\_ideas of what I'd like to make with macramé and forms I'd like to use for the project.
- 14. It took me \_\_\_\_\_ day(s) to think of the idea I used in my final macramé piece.
# Rating Scale--Three Art Experts

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1.	Degree to which the idea is new (none other has it)	VERY LITTLE	LITTLE	SOME	мисн	VERY MUCH
2.	Rate at which student used different patterns of <b>knots</b> as compared to those done in the first macramé work					
3.	Extent to which material fits intended function of the finished piéce					
4.	Degree to which combin- ation of knots are used in a functional manner					
5.	Rate at which student made use of more than one type of material (1.ebeads or wood, yarn and twine,etc					
6.	Extent of rearangement of knot combinations					
7.	Degree to which student showed development of new ideas as worked on final macramé piece					

8. Number of different knots and combinations of knots used-----.

APPENDIX B

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EXAMPLES OF HAND-OUT MATERIAL ON MACRAME

(Copy of this handout **a**heet was received by both groups before knotting began)

Each cord is mounted on the holding cord by folding it in half and attaching it with a Reversed Double Half Hitch, as shown in the following four steps: (dowel rod or similiar object may be used in place of the holding cord.)

- 1. The knotting cord is folded, bringing ends A and E together.
- The top of the loop C is brought down over the cords A and E, forming loops B and D.
- 3. B and D are folded back until they are touching. This wraps C around the two cords A and E. (3)
- 4. The holding cord X-Y is placed through loops B and D, and the knot is tightened by pulling firmly on A and E.
- 5. Additional cords are added in the same manner. (5)



HALF KNOT



Pull tight and repeat. (Knots will cause a twisting sinnet.)



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HORIZONTAL DOUBLE HALF HITCH

the length of other cords.)

HALF HITCH

#### SQUARE KNOT

Follow Step One for Half Knot: complete the square with the following



(If the last cord on the left <u>curves</u> under the loop on the left, then the next cord on the right goes under the filler cords.)



#### JOSEPHINE KNOT

(In the braid every other knot is reversed to keep the cord from twisting: The reverse knot starts with a loop in the right hand cord, rather than in the left hand cord.)





DIAGONAL DOUBLE HALF HITCH

The only difference between the Horizontal Double Half Hitch and the Diagonal Double Half Hitch is the position in which the knot-bearing cord is held as the knotting is done.

Divide your cords into two groups (Half of the cords in one group and the other half in the other group). Cord 1 becomes the knot-bearer, and it is held in the right hand at a 45-degree angle to the last row of knots. It is kept taut at all times. Cords 2,3,4,5,6,7, and 8 are tied in Double Half Hitches over cord 1, which is kept at a 45-degree angle as each cord is knotted over it. 1



In the second group of eight cords, cord 16 becomes the knot-bearer, and it is held in the left hand at a 45degree angle. Cords 15,14,13,12,11, 10, and 9 are knotted over it, in that order, in Double Half Hitches. (2)

Now we come to the intersection of the two knot-bearing cords, 1 and 16; They must be knotted together, and cord 16 becomes the knot-bearer. It is placed over cord 1 and held taut with the left hand. A Double Half Hitch is tied with Cord 1 and Cord 16. (3)

Complete the lower part of the X in the same manner as the top part of the X. (4)

VERTICAL DOUBLE HALF HITCH

In the vertical double half hitch the cord which has been the knotbearing cord in the horizontal and diagonal double half hitch becomes the cord with which all the tying is done. The double half hitch is tied vertically instead of horizontally or diagonally. This takes a lot of cord so quite a long tying cord is needed.

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STEPS IN PLANNING PROJECTS

First, decide what you would like to make, then, decide the type of material to use. Also determine that shape it will be and the size it should be.

Determine the number of pieces of cord are in an inch by wrapping them around a ruler. Divide the number of cords in an inch by two since the cords are doubled for mounting.





(3)





Depending upon how thick the cord is, multiply the length needed by 4 or if it is thick (approximately 1/16 of an inch or more) multiply by 5.

## PLANNING AND EXECUTING PIECES

Pieces are drawn out by shape and size wanted on paper and knotted on top of the paper. (In vests and similar items cords not knotted when the armhole is shaped will be finished off, and a braid will be used as an edge trimming.)

#### ADDING ON

Any piece that becomes wider as the knotting progresses is shaped by adding cords.

### TAKING AWAY

Width is reduced by leaving unneeded cords inactive. After the piece is completed, they are knotted or worked into the back of the piece and trimmed.

#### I. SAMPLER INSTRUCTIONS

(Group 1-Pattern Approach)

Materials:

Cut strands of yarn 100 inches long

Cut 1 strand of yarn 170 inches long for the left-hand cord.

Cut 1 strand of yarn 6 inches long for the holding cord; or use a dowel stick.

Directions: First, mount cords on holding cord or dowel stick. Long cord outside. Knot cords on holding cord with reversed double half-hitch. The left-hand cord is folded so that the outside cord, cord 1, measures 120 inches; cord 2 will measure 50 inches or the same as the rest of the cords. 4 rows horizontal double half-hitch...begin at left-hand side.

Diagonal double half-hitch to form S.

1 row horizontal double half-hitch...(long cord should be at the left) start with lefthand cord; this knot uses a great deal of cord so make certain you are using the long cord.

1 row of horizontal double half-hitch Sinnets of half knots: knot 7 half knots in each sinnet. 1 row horizontal double half-hitch---start with right-hand cord.

Square knot sinnets---5 rows.
1 row horizontal double half-hitch: start with left-hand cord.
5 rows alternating square knot.
1 row horizontal double half-hitch: start with right-hand cord.
Diagonal half-hitch to form V. Cut off uneven ends.

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# KEY FOR KNOTS

Both groups I and II received this key before planning their final macramé project.)

Key for knots used in drawing to be done for visualization and to convey idea to others.

-Square Knot -Half Knot \Lambda -Double Half Hitch **∆** -Half Hitch **\$\$** -Loose strings (without knots) 6 -Overhand Knot

\*For beads, wood, etc. and for knots you've made up or new knots you have found make up your own symbols.

CHECK YOURSELF

\* Are you using more than one type of material? (such as yarn, thread, reed, etc.)

\* Are you using another type of art technique?

\* Is your project different from anything you've seen?

\* Is the form designed to help it meet its function?

\* Have I created my own knots?

\* Am I using the knots I've learned in a different way?



APPENDIX C

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EXAMPLE OF STUDENT'S PLAN FOR FINAL MACRAME

# EXAMPLE OF STUDENT'S

# PLAN FOR FINAL MACRAME

(Copied from original plan by one of the students in Group II.)



APPENDIX D

PHOTOGRAPHS OF MACRAMÉ COMPLETED BY GROUPS I AND II



Example of first macramé project - Group I (All followed the same pattern for this sampler)



PLATE II

Examples of final macramé project - Group I



Examples of final macramé project - Group I



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Examples of first macramé project - Group II (All were different in design.)

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An example of the final macramé - Group II



Examples of the final macrame - Group II

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APPENDIX E

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EXAMPLE OF TABLE USED TO COMPLETE DATA

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An example of the thirty-one tables used to compile data before computing the results is shown below. Only one table is shown here because the large number of tables used, made it impractical to include them all in the Appendix.

### TABLE X

### Teacher Checklist

## Question 11

# <u>Group 1</u>

	<b>L</b>	- 2	3
Raw	Scores	Deviations	Squared Deviations
2	X	$\mathbf{x} = \mathbf{X} - \mathbf{M}$	x <sup>2</sup>
	1		16
•	1	4	.10
	1	4	.10
	2	+.6	• 36
	2	+.6	• 36
	2	+.6	• 36
	1	4	.16
	1	4	.16
	1	4	.16
	1	4	.16
	2	+.6	.36
	2	+.6	. 36
	1	4	.16
	1	4	.16
	2	+.6	• 36
	1	4	.16
ΣX=	21	x= 0	$\overline{2}$ = 3.60

The following number values were given to the word ratings used to record observations: very little - - 1 point, little - - 2 points, some - - 3 points, much - - 4 points and very much - - 5 points.