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The Relationship of the Creativity of Teachers and Their Students

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THE RELATIONSHIP OF THE CREATIVITY OF TEACHERS
AND THEIR STUDENTS

A Thesis
Presented to
the Graduate Faculty
Central Washington State College

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

by
Norman Frederick Erken

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DEDICATION

I wish to dedicate this thesis to my wife, Nancy, and my children, Sharon, Kristine, and Angela. Without their company and patience, the job would have been much more difficult and less pleasant.

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CHAPTER I
INTRODUCTION

There has been a great deal of work done in the area of creativity in the last twenty years. From the research have been made suggestions and recommendations as to the type of atmosphere that should be established to facilitate the optimum of creative behavior.

Eyring (1959), speaking from the scientist's viewpoint, has this to say about conditions for creativity:

Even the gifted individual requires a stimulating environment, including freedom from distractions which deflect attention from the question at issue, and freedom from an authoritarian society which prevents unbiased inquiry. He profits likewise from congenial surroundings and stimulating company. He should preferably be completely at peace with the world except for the violent conflicts characterizing the problem engaging his attention. Thus he needs to be independent from the problem at hand (47).

Inversely, VonFange (1959) describes conditions in an industrial setting that will adequately discourage and stifle the creative process:

Creativity is discouraged in an environment where everyone is assigned enough activities to fill each working week--simply because supervisors can more easily observe, correct, and measure physical results in terms of jobs completed. It is difficult to measure it, therefore, supervisors may be loath to allow any time for such abstract activity. As a consequence, they cannot accept any innovations, since applied creative effort demands time and thought (32).

Although VonFange was speaking of industry when he made this statement, the same can be said for the school atmosphere.

Another area of interest that has been explored is the area of qualities of the teacher deemed most important by the students. Ruth Strang did a study of this nature and found these qualities to be: (a) Sense of humor, and (b) Encouragement of creativity in teacher candidates (Torrance, 1965).

Getzels and Jackson discovered that teachers considered the high I.Q. group more desirable as students than either the highly creative group or those that were neither highly creative nor of high I.Q. With this consideration, it can be said that, under average conditions, creativity is discouraged rather than encouraged (Getzels and Jackson, 1962).

With the assumption that fostering creativity is important and that teachers generally find these students difficult to work with, it seems necessary to narrow the field in selecting individuals who can most efficiently aid in the student's creative development.

Purpose of the Study

In examining the research related to creativity and its educational implications, one finds a dearth of information directly related to the creativity of a teacher and whether or not it carries over to and influences the creativity of the students with whom she works. One such study by Yamamoto (1962) has been conducted.

It is the purpose of this study to determine whether or not there is a relationship between the creativity of a teacher, as measured by the Torrance Tests of Creative Thinking Verbal, Form A, and the creativity of the students with whom she works, as measured by the same instrument.

Hypothesis of the Study

The null hypothesis for this study was that there would be no significant correlation between the scores of teachers and their students on the Torrance Tests of Creative Thinking.

Terms Used in the Study

Creativity

For the purposes of this study, creativity is defined as the score obtained on the Torrance Tests of Creative Thinking.

Review of the Literature

A review of the literature has indicated a dearth of information directly related to the influence of the teacher's creativity on that of her students. It is very easy to say that it requires a highly creative person to work with and influence creativity in students. It is frequently maintained that one must be a handicapped person in order to work well with the handicapped, that one must have been an alcoholic to counsel an alcoholic, or that to teach minority group members one must also be of the same group. There does, however,

seem to be many types of individuals capable of working with children and in turn aiding to a high degree the development of creativity within the individual student. This research attempted to determine the relationship between the creativity of the teacher and the student as measured by the Torrance Tests of Creativity.

Teachers, as a group, have undergone little investigation for creative ability. Evidence has largely been in the form of descriptive word pictures of creative teachers encountered by interested researchers. Torrance (1962) picked out a core of commonality in three such studies of creative teachers. They all are described as highly sensitive, flexible, resourceful, and willing to "get off the beaten track" (73). They show uniqueness and diversity and have the capacity to form good relationships with their creative students. Creative teachers are pictured as more likely to attempt difficult tasks which may result in failure. They may show some eccentricities, be nonconforming, and seem at times to be childish. They are not so concerned with social conventions related to courtesies and may appear primitive, naive, and unsophisticated at times. Their absorption in helping children develop may lessen their sociability with others. They are frequently rather shy and somewhat withdrawn and quiet. At certain times and in certain situations they may exhibit haughtiness, selfsatisfaction, discontentedness, fault-finding, and independence of thinking.

Though authorities in the field have stressed the importance of the role of the teacher in promoting creative growth in the classroom, there has been little supportive data available for this contention. The complexity of the problem and the difficulties involved in controlling all the variables have formed an obstacle most researchers don't care to surmount. Foremost among the few studies that have been attempted is one by Yamamoto (1962), an associate of E. Paul Torrance. Torrance analyzed some of the data collected by Yamamoto in his testing manual (Torrance, 1966). The subjects consisted of 19 fifth grade teachers and all of the fifth graders in the same school system. The teachers took a creativity test as well as a test that measured their tolerance for complexity and theoretical orientation. Achievement, intelligence, and creativity tests were administered to the children. After five months, the students were again given achievement tests. In examining the results, Torrance chose two teachers to amplify his findings. Teacher A scored as one of the lowest on creativity, tolerance for complexity, and theoretical orientation. In her class, six of the seven children designated as highly creative underachieved and eleven of the twelve less creative children overachieved. Teacher B was one of the high scorers on the tests of creativity, tolerance for complexity, and theoretical orientation. All four of the highly creative children in her room overachieved; ten of her low creatives also qualified as overachievers. Torrance

explains these differences by the emotional environment provided by these two different personalities. This analysis would be more meaningful had all the teachers and students been employed and a statistical treatment given to the research.

As stated by Freeman (1965), the traits of creative persons are: (a) Prefer complex and unstructured situations; (b) High esthetic and theoretical values; (c) Are independent in their judgement; (d) Prefer to set their own goals; (e) Are willing to assume responsibility for unusual activities; (f) Are flexible and adaptive; (g) Are open to and expressive of emotional feelings; (h) Have intellects that are more perceptive of nuances; (i) Have more far-ranging interests and are more receptive to experiences; (j) Are more introspective and even introvertive; (k) Show little defensiveness in their thinking and activities; (l) Are less interested in small details or in facts for themselves, but are more interested in meanings and implications; (m) Are more intuitive in sensing the meanings of their perceptions and ideas; (n) Are more complex persons, hence more difficult to analyze than non-creative persons. This offers some form of guideline as to the traits being considered. Some writers add to this list; others may delete, but this will generally cover what is being discussed (3).

As was stated in the introductory paragraph, there is the theory that the creative teacher is the one who should be

expected to work with the students to foster creativity. Hill, Mackintosh, and Randall (1954), state, "To be most skillful in helping children be creative, the teacher himself must be creative in his point of view" (4). Yet Torrance (1964) claims, "There has been little or no empirical research to determine the characteristics of creative teachers or teachers who are effective in guiding creative growth" (51).

Hallman (1967) indicates that creativity can be taught and that creative teaching is the best way, perhaps the only way to promote creative behavior on the part of pupils. Each teacher must invent his own creative techniques as a part of his teaching activities within his own classroom.

Part of a creative classroom setting is the teacher and the role he plays in relation to each of the students. Mueller (1967) feels that, "Descriptions of creativity in students point out the likelihood of a 'sponsor' who provides understanding and support. This is usually a teacher" (152). There are certain qualities that are useful in fostering wholesome learning in the classroom, but it is difficult to see how a teacher who does not have a strong characteristic of independence and "courage of convictions" can wholeheartedly accept--and stimulate--this behavior in children. In the same respect Taylor (1964), quotes a recent study of his that only one of perhaps 15 or 20 at the teacher level is psychologically able to listen to all the new ideas from those whom they oversee . . ." (5).

The teacher's role is varied and quite nebulous, but it is generally believed that one of his responsibilities is to establish conditions whereby students will be motivated to develop their creative talents. Guilford (1950) feels that whether or not the individual who has the requisite abilities will actually produce results of a creative nature will depend upon his motivational and temperamental traits. It remains to be seen whether or not the teacher who scores high on a creativity test will appear as strong a variable in the creativity of the students with whom she works.

Several writers have offered lists of more specific objectives and strategies that should be used to establish conditions that will foster creativity. One of these men, who speaks in more general terms, is Freeman (1965) who says that the teacher's role is particularly important in defining the objectives of a course of instruction, even at elementary levels.

Thus the purpose of a course of study and the methods in instruction can either promote stereotype routine acquisition of material or encourage the development of mental processes needed in original, creative activities. In his book, Setting Conditions for Creative Teaching in the Elementary School, Smith (1967) lays down eighteen specific principles of creative teaching. They are:

(a) In creative teaching, something new, different or unique results; (b) In creative teaching, divergent thinking processes are stressed; (c) In creative teaching, motivational tensions are prerequisite to the creative process. The process serves as a tension relieving agent; (d) In creative teaching, open-ended situations are utilized; (e) In creative teaching, there comes a time when the teacher withdraws and the children face the unknown themselves; (f) In creative teaching, conditions are set which make possible pre-conscious thinking; (g) In creative teaching, the outcomes are unpredictable; (h) Creative teaching means that students are encouraged to generate and develop their own ideas; (i) In creative teaching, differences, uniqueness, individuality, originality are stressed and rewarded; (j) In creative teaching, the process is as important as the product; (k) In creative teaching, certain conditions must be set to permit creativity to appear; (l) In creative teaching, teaching is "success" rather than "failure" oriented; (m) In creative teaching, provision is made to learn knowledge and skills but provision is also made to apply these in new problem-solving situations; (n) In creative teaching, self-initiated learning is encouraged; (o) In creative teaching, skills of constructive criticism and evaluation skills are developed; (p) In creative teaching, ideas and objects are manipulated; (q) Creative teaching employs the democratic process; (r) In creative teaching, methods are used which are unique to the development of creativity (55).

Smith (1967) also discusses the blocks to creative teaching. Such things as lack of teacher intelligence, rules and regulations requiring conformity, overplanning, planning the same program for every child, and use of closed questions are some of the "teacher" related blocks. He also identifies other blocks, such as abuse, or overuse of gimmicks (a.v., games, etc.), overuse of textbooks, and finally administration and school policy.

Hallman (1967) describes the creative teacher as one who:

. . . provides for self-initiated learning on the part of the pupils; sets up nonauthoritarian learning environments; encourages pupils to overlearn to saturate themselves with information, imagery and meanings; encourages creative thought process; defers judgment; promotes intellectual flexibility among students; encourages self-evaluation on individual progress and achievement; helps the student to become a more sensitive person; knows how to make use of the question; provides opportunities for students to manipulate materials, ideas, concepts, tools and structures; assists students in coping with frustrations and failures; and urges pupils to consider the problems as wholes (294).

Others have written about what is necessary to develop creativity, but most merely repeat what has been stated above. Miner (1963-64) offers a list of five elements that lead to creativity. They are acceptance of the students as individuals, wonderment of the miracle of living, encouraging ideas which evolve from observation and thought, allowance of a freedom of language, and acceptance of each bit of raw creativity which is submitted.

Rugg (1963) feels that tension is the key to all creativity, that without it, enough pressure is not brought to bear to spark the energies of creative imagination. Freeman (1965) states that encouragement, openmindedness, flexibility, and high and critical standards for the learner are the keys to developing creativity in an individual.

As has been stated by nearly every author, creativity can be developed and taught. Guilford (1958) points out that students can be exposed to experiences and problems in all areas to develop creative thinking. Much depends on how

subject matter is taught and the attitudes of the teacher who must understand the nature of creative performances as well as her own ability to select appropriate materials.

Another facet to be discussed is the creative administrator, the person who has a direct bearing on the teacher who works with the child. Torrance (1962) sets down what he considers to be important characteristics of a creative administrator:

- (a) He is a man of curiosity and discontent. He is always asking "Why did this happen?" or "What would happen if we did it this way?"
- (b) He is a man with unlimited enthusiasm for his job. He is restless, intense, strongly motivated, completely wrapped up in what he is doing.
- (c) He is a man with the talent of transmitting his enthusiasm to his associates. He creates an atmosphere of excitement and urgency.
- (d) He is flexible. He keeps an open mind and is willing to accept and use new information. He listens to new ideas and does not flatly dismiss ideas with "don't be ridiculous" or "we tried that before."
- (e) He is unorthodox and boldly questions conventional ideas. He is goal-oriented, not method-oriented. He is willing to pay the price of physical and mental labor to achieve goals and is impatient with anything that gets in the way (31).

With this in mind, there would be a greater chance for the establishment of more creativity conditions within the classroom, conditions such as those described by Hill, Mackintosh, and Randall (1954). They request an attractive and stimulating environment with materials and tools, plenty of time and space, and a permissive and appreciative atmosphere.

Smith (1967) offers a detailed list of physical conditions necessary in the classroom for the development of

creativity, but in summary he states that it is developmental and its growth depends largely on the environment in which it is placed and the conditions which nurture it or thwart it.

Lowenfeld (1947) concludes that:

If children developed without any interference from the outside world, no special stimulation for their creative work would be necessary. Every child would use his deeply rooted creative impulse without inhibition, confident in his own kind of expression (143).

This, however, is found to be quite difficult; therefore it is important to isolate as many variables as possible in determining the best means to foster creativity.

Mueller (1967) brings up a point that is in the undertones of several other articles, but he put it in very concise terms.

There is no guarantee that a really creative individual could be helpful to teachers, administrators, or even students. He may be totally ineffective in a public school setting perhaps volatile. But, certainly something can be learned through interaction with one who is accepted by staff, personnel and students as being creative (155).

Creativity and individuality are currently of great concern to our society. The school, as one of society's institutions, is reflecting this concern in its efforts to design and implement programs to foster creativity in children. Inevitably, in any new order, roles must change with the times. The concept of the teacher's role has been affected by these changes, perhaps more than any other position in the hierarchy of education. In hiring teaching personnel,

lip service, anyway, is paid to the importance of the so-called creative teacher and the superior attributes he may possess. It is of particular concern to establish if high creative and low creative teachers do indeed show a direct influence on the creativity of the students with whom they work.

CHAPTER II

METHOD

The subjects of this study were 28 teachers and all the students these teachers had for four or more hours a day. A second criteria for inclusion of the students was that they had to have been with the teacher for no less than five months of the current year.

Instruments

The instrument used for the study was selected after reviewing the Buros Sixth Mental Measurements Yearbook and several other sources on testing creativity. The Torrance Tests of Creative Thinking were still in the research edition. This instrument had been used most successfully by its author, a recognized authority in the field of creativity, and was selected on that basis.

The Torrance Tests of Creative Thinking were developed by Dr. E. Paul Torrance and his associates at the University of Minnesota. After approximately nine years of sustained research and development, the research edition was released for more general use in 1966. To use these tests effectively, one must accept Torrance's definition of creativity as it provided the basis for the creative tasks developed. Torrance sees creativity as:

. . . a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on: identifying the difficulty; searching for solutions, making guesses or formulating hypotheses about the deficiencies; and retesting them; and finally communicating the results (Torrance, 1966, p. 6).

Torrance justifies this approach to defining creativity by citing the following reasons. He feels it describes a natural human process with strong human needs involved at each stage. Incompleteness or disharmony arouses tension which we must resolve by investigating, diagnosing, manipulating, and making guesses and estimates to bring about a solution. Our guesses or hypotheses must be tested, modified, and retested; then we must tell somebody of our discovery before our tension is relieved. Other justification for this definition is that it allows one to begin defining operationally the kinds of abilities, mental functioning, and personality characteristics that promote or inhibit the process. Torrance feels it "provides an approach for specifying the kinds of products that result from the process, the kinds of persons who can engage most successfully in the process, and the conditions that facilitate the process." He also emphasizes its applicability to artistic, scientific, literary, dramatic, and interpersonal creativity and its harmony with historical usage.

The Torrance Tests of Creative Thinking were designed for use from kindergarten through graduate school. Within the context of the definition of creativity used by Torrance,

tasks were chosen which met two criteria: those which could be the most easily and economically administered and scored, and those which stood best the tests of reliability and validity while at the same time sampling as many different kinds of manifestations of creative thinking ability as possible. The activities on the Verbal test, Form A, include the following: asking questions about a drawing, making guesses about the causes of the event pictured, making guesses about the possible consequence of the event, producing ideas for improving a toy so that it will be more fun to play with, thinking of unusual uses of cardboard boxes, asking provocative questions about cardboard boxes, and thinking of the varied possible ramifications of an improbable event.

In assessing the reliability of his battery of creative thinking tasks, Torrance (1966) suggests that a number of variables must be taken under consideration. First, almost all theories of creative functioning place great emphasis on the importance of emotional factors, bodily states, group atmosphere, etc. Certain psychological states are necessary for the production of fundamentally new ideas. Such states include involvement-detachment, deferment of judgment, speculation, playfulness, and the like. The time factor also plays an important part in test reliability. For example, children who have experiences which enable them to learn in creative ways develop differently from those whose creativity is stifled by an atmosphere which discourages creative growth.

Some teachers may favor some kinds of creative development over others. Children, therefore, cannot be expected to develop at the same rate even within themselves. The factor of motivation plays a very important part in assessing reliability according to Torrance. Creative thinking requires expensive energy, and the more expensive energy utilized, the more important the motivational factors. Torrance stresses the aforementioned variables to warn that although the test-retest reliability may be low, this does not necessarily make the instrument unreliable or lacking in usefulness.

Little has been done in testing the test-retest reliability with all four of Torrance's complete batteries. Only two studies were given as meeting this criteria of using alternate forms. The first study included 118 fourth, fifth, and sixth grade children in St. Croix, Wisconsin; the second study involved 54 fifth graders in White Bear, a St. Paul, Minnesota suburban school. The latter group was subdivided into 28 Experimentals and 26 Controls. The alternate forms of both the verbal and figural tests were administered to the first two groups one to two weeks apart and to the third group, eight months apart. The reliability coefficients for the verbal tasks only are presented here as they are apropos to this study. The three measures were Verbal Fluency, Verbal Flexibility, and Verbal Originality. The Wisconsin group had coefficients of .93, .84, and .88 respectively. The Minnesota experimental group had correlations of .87, .84, and .79 in

the same order. The control group, which had the longest time lapse, scored .79, .61, and .73 (Torrance, 1966).

An experiment to determine the scoring reliability of untrained personnel was conducted in 1965-66 by Torrance (1966). Six participating teachers and two educational secretaries were given a copy of the scoring guide and a set of completed test booklets to score. The mean coefficients of correlation for the Verbal form of the test in this study were Fluency, .96; Flexibility, .94; Originality, .85; and Elaboration, .90. Torrance feels the single most important factor in low interscorer reliability is failure to read the scoring guide carefully and accept and apply its criteria. He suggests that increased reliability of scoring can be attained by setting up a training program in which scoring rationales are discussed, practice is provided in applying the guides, and there are opportunities to examine and discuss scoring differences of single sets of responses.

A test's validity is often defined as the extent to which the test measures what it purports to measure (Nell, 1957). Torrance (1966) stresses the impossibility of providing all research workers and potential users of tests of creative thinking with high coefficients of validity. The myriad definitions attached to the construct, creativity, and the infinite number of ways one can behave creatively defy provision of an overall measure of validity. Torrance

determines validity for his tests within the conceptualization provided by his definition. He feels that one can then consider process, product quantity and quality, personality characteristics, group dynamic variables, and other environmental factors that promote or impede the type of functioning described by the process definition.

In checking content validity, one should be aware of the limitations of the present tests of creative thinking. Torrance (1966) does not feel that "anyone can begin to specify the number and range of tests tasks necessary to give a complete or even an adequate assessment of a person's potentialities for creative behavior." In attempting to attain as high a content validity as possible under the existing conditions, Torrance has made a consistent and deliberate effort to base the test stimuli, the test tasks, instructions and scoring procedures on the most up-to-date theories and research presently available. Test tasks have been designed which are free of technical or subject matter content. In selecting the test tasks, Torrance researched and analyzed the lives and personality characteristics of eminent creative individuals, the nature of performances regarded as creative, and research and theory concerning the functioning of the human mind.

Concurrent validity is "determined by correlating test scores with some other measurement of the same ability that the test was designed to measure" (Smith & Adams, 1966,

p. 64). For example, Nelson (1963) compiled a list of personality characteristics of creative persons from a review of relevant literature. These were made into Q scores to establish weights by a panel of judges. The checklists containing these characteristics were then used in obtaining from teachers descriptions of the outstanding characteristics of each child. When the scores of the upper and lower 27 per cent of each grade level were compared, all the verbal measures on the creativity tests differentiated the two groups at better than the .01 level. On the figural measures, only originality and elaboration were discriminating at better than the .05 level (Nelson, 1963, as given by Torrance, 1966).

Because of the time lapse necessary for substantiating predictive validity, there is little to go on at this point in evaluating the Torrance Tests of Creative Thinking. The author, his associate, and other research workers are involved in on-going studies and are planning others for the near future. Data as to the results of these studies should be forthcoming soon (Torrance, 1966).

Procedures Used in the Study

The Torrance Tests of Creative Thinking, Verbal, Form A, was administered to 31 educators. This same test was then administered by 15 of these teachers to their students. The criteria used to select the classes of students was that they

must be with the same teacher at least four hours a day for a period of six months. Following the administration of the test, a two hour session was spent with the scorers, familiarizing them with the procedures of scoring the tests. Special emphasis was placed on following the scoring manual closely. Comparisons were made between the two groups in the three areas: fluency, flexibility and originality using a t test for significance. Tests were also made to determine whether or not there was any correlation between teacher's ages and their scores, differences in sexes and scores, (both teachers and students), grade level of teachers and scores (K,1,2,4,5,6) and scores of students of public schools and private schools.

Because no norms other than fifth grade were furnished with the Torrance Tests of Creative Thinking, it was necessary to use a standard score and then compare one class against another as well as one group of teachers against another.

CHAPTER III

RESULTS

The H_0 that there is no significant correlation between the scores of the teachers and their students on the Torrance Test for Creative Thinking could not be rejected. Using a Spearman's test for rank order correlation with an N of 15, to show a significant correlation, a coefficient of .645 or greater is required. The correlations coefficients obtained on this test were: fluency .251, flexibility .205, and originality .366.

It is shown that there is no significant correlation between age and the three phases of the test. Using a Pearson r with 28 df a correlation of greater than .355 is required for significance. The correlation between age and fluency is -.192, age and flexibility -.293, and age and originality -.255.

There was significant difference between the scores of kindergarten children and all others tested. For kindergarten and first grade the scores on the t test were: fluency -8.285, flexibility -7.904, originality -7.180. All of these were significant at the .01 level. For kindergarten and fourth grade the scores were: fluency -5.057, flexibility -5.881, and originality -5.313. All three indicate a significant

difference at the .01 level. The t 's for kindergarten and fifth grade were: fluency -7.281, flexibility -7.170, and originality -4.579. With 141 degrees of freedom they are significantly different at the .01 level. The scores for kindergarten and sixth grade were: fluency -10.153, flexibility -9.747, and originality -7.135. All three scores indicate a significant difference at the .01 level.

Using a t test as the test for significant differences of the first grade and the other classes tested, a score of 2.048 on the originality section was computed. This is significantly different at the .05 level. The score for originality between the first grade and fifth grade was 3.490. This indicates a significant difference at the .01 level. The score for originality between the first grade and sixth was 2.359, a significant difference at the .05 level.

Using a t test for significant differences of secondary and elementary teachers there were no significant differences indicated.

A t test was used to determine significant differences between female and male teachers. The results of the test were: fluency, a t of -2.996 which is significant at the .01 level, flexibility a t of -2.521 which is significant at the .05 level, and originality with a t of -2.029 with degrees of freedom of 30. The .05 level has a t of 2.042.

CHAPTER IV

DISCUSSION

Results of this investigation indicate that it is not necessarily the creativity of the person who is the teacher that determines the creativity of the child in the classroom. There is some correlation so that the teacher's creativity cannot be totally ruled out, but there are other factors to be considered. The fact that the child is with this person a minimum of one sixth of the day as well as only a small portion of his present life is certainly a large factor.

This variable of teacher creativity may be more important than the correlation coefficients indicate. Because this is a positive correlation, with a large population probability of a more accurate prediction is increased.

Although general consensus seems to agree with Hill, Mackintosh and Randall (1954) when they say that "To be most skillfull in helping children be creative, the teacher himself must be creative in his point of view" (18), most of the writers in the field of creativity are more cautious. Statements made such as, "Since the teacher sets the emotional climate of the classroom, his personality is also an important element in implementing creativity." Scofield (1958), and

Hallman (1967) point out that the teacher must be inventive and develop his own creative techniques as part of his teaching activities within his own classroom. No research has yet appeared to indicate whether or not these assumptions previously mentioned are valid.

Another section of this study that showed significant results was in the scores of the kindergarten children in relation to all others tested. The kindergarten children scored significantly lower on the test than did all other children. This writer feels that this is a direct result of the fact that nearly half the kindergarten children tested were unable to formulate questions which was required on two sections of the test. Because of this inability they were able to complete only five of the seven sections of the test.

This may indicate that the Torrance Tests of Creative Thinking is inappropriate for use with kindergarten and preschool children.

A third significant aspect of this study was in relation to the scores of female teachers and male teachers. The male teachers scored significantly higher in fluency and flexibility and very close to a significant level in originality. The writer can see no particular reason for this nor is there any apparent research or writing that might offer a clue to the reason for this.

Research Implications

There have been very few, if any, attempts to determine the relationship of a teacher's creativity and that of the students with whom she works. This study was originated from the assumption that a creative person is needed to transmit creativity on to others. From the results of the study it can be said that this is not necessarily so. For further studies, it is important to define particular aspects of creativity so that, if possible, it can be measured and other variables to be isolated could be teacher's attitude, physical, intellectual, emotional, and social environment of the student.

Another implication to be derived from this study is that nearly half of the kindergarten students tested were not prepared for this particular type of test. This might offer certain educational implications to kindergarten and pre-school children.

CHAPTER V

SUMMARY

It was concluded in the present study that there is no significant correlation between the score of teachers on the Torrance Tests of Creative Thinking and the scores of their students on the same test.

It also showed that kindergarten children require more concentrated effort in developing a verbalized question or the Torrance Tests of Creative Thinking will have to be re-designed for kindergarten and other preschool children.

Finally, a significant difference in scores of men and women on two of the three sections of the test scores was observed.

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APPENDIX A

RAW SCORES, TEACHERS

TORRANCE TESTS OF CREATIVE THINKING, VERBAL

Teacher	Sex	Verbal Fluency	Verbal Flexibility	Verbal Originality
1	F	85	32	78
2	F	78	39	83
3	F	89	40	76
4	F	74	40	69
5	F	80	50	78
6	F	132	66	118
7	F	61	27	48
8	F	40	22	39
9	F	96	42	87
10	M	76	39	62
11	F	55	33	50
12	M	137	50	100
13	F	71	39	72
14	M	90	42	66
15	M	128	73	106
16	F	115	56	114
17	F	86	42	67
18	F	94	43	85
19	M	55	36	58
20	F	84	53	74
21	F	84	41	66
22	M	94	43	81
23	M	109	47	85
24	M	115	54	89
25	F	64	38	79
26	F	79	46	53
27	F	143	62	108
28	M	143	64	108
29	M	168	89	147
30	M	114	57	84
31	M	152	66	147

APPENDIX B

RAW SCORES, STUDENTS

TORRANCE TESTS OF CREATIVE THINKING, VERBAL

KINDERGARTEN

Student	Verbal Fluency	Verbal Flexibility	Verbal Originality	Student	Verbal Fluency	Verbal Flexibility	Verbal Originality
1	58	28	15	44	18	13	7
2	40	24	27	45	49	28	24
3	12	5	3	46	42	26	20
4	28	16	16	47	36	27	12
5	15	10	3	48	50	26	18
6	53	29	28	49	66	37	30
7	36	15	19	50	84	35	47
8	20	9	7	51	41	22	11
9	26	14	10	52	37	22	15
10	40	27	21	53	44	21	13
11	41	20	20	54	35	17	1
12	20	13	12	55	33	22	12
13	47	22	21	56	70	30	26
14	24	15	8	57	57	25	24
15	35	21	15	58	28	15	9
16	23	14	13	59	34	17	10
17	24	14	13	60	13	8	7
19	64	31	24	61	5	5	5
20	48	23	14	62	50	24	18
21	44	17	7	63	60	34	32
22	33	16	8	64	41	27	27
23	35	14	1	65	40	22	12
24	51	21	18	66	28	13	12
25	30	16	12	67	28	21	7
26	23	14	8	68	37	22	47
27	16	10	4	69	29	19	15
28	29	16	6	70	37	21	13
29	22	11	6	71	26	18	13
30	35	19	19	72	19	13	10
31	24	14	5				
32	33	19	8				
33	36	23	18				
34	28	14	5				
35	26	7	5				
36	31	17	17				
37	38	21	16				
38	61	21	10				
39	35	15	6				
40	18	11	3				
41	24	11	3				
42	22	15	3				
43	27	13	5				

GRADE ONE

Student	Verbal Fluency	Verbal Flexibility	Verbal Originality	Student	Verbal Fluency	Verbal Flexibility	Verbal Originality
73	55	31	29	93	77	41	36
74	71	38	20	94	92	48	40
75	24	15	7	95	76	32	38
76	52	29	22	96	71	27	29
77	46	24	39	97	32	16	18
78	36	23	12	98	46	27	14
79	49	28	18	99	102	38	58
80	82	44	41	100	66	31	57
81	69	37	42	101	51	29	30
82	56	25	25	102	99	35	30
83	105	39	58	103	85	29	31
84	65	39	25	104	104	43	75
85	52	26	23	105	46	11	19
86	57	33	34	106	80	37	31
87	71	44	43	107	75	27	43
88	59	26	22	108	61	22	17
89	57	22	16	109	62	53	79
90	64	48	51	110	78	36	29
91	58	32	25	111	64	25	44
92	51	31	24	112	33	21	13

GRADE FOUR

114	107	40	18	130	43	22	30
115	41	19	7	131	119	45	25
116	55	27	13	132	19	8	7
117	45	22	30	133	86	28	49
118	22	12	16	134	24	10	5
119	24	13	14	135	15	9	1
120	42	25	33	136	34	18	20
121	43	16	12	137	27	16	16
122	77	33	41	138	60	32	24
123	83	26	42	139	50	28	19
124	29	18	19	140	70	29	46
125	78	27	27	141	35	26	12
126	27	13	7	142	35	27	18
127	38	21	7	143	36	24	17
128	49	32	24	144	44	32	27
129	68	27	41	145	63	45	34

GRADE FOUR (Cont'd.)

Student	Verbal Fluency	Verbal Flexibility	Verbal Originality	Student	Verbal Fluency	Verbal Flexibility	Verbal Originality
146	64	47	42	158	31	23	13
147	77	56	41	159	47	35	23
148	140	62	47	160	21	17	8
149	42	25	27	161	69	46	37
150	71	51	42	162	98	64	43
151	49	38	21	163	96	55	54
152	48	32	22	164	70	57	44
153	49	37	32	165	51	39	17
154	42	23	14	166	37	18	10
155	77	58	55	167	76	52	30
156	74	36	20	168	104	61	68
157	49	38	23				

GRADE FIVE

169	56	28	17	194	90	46	38
170	85	42	37	195	74	37	36
171	80	34	16	196	88	45	38
172	50	30	22	197	78	33	23
173	42	20	10	198	79	41	50
174	96	40	32	199	95	34	28
175	75	33	36	200	93	45	39
176	65	34	35	201	65	32	30
177	85	25	13	202	94	33	36
178	43	25	30	203	75	38	31
179	103	41	22	204	77	43	39
180	57	27	19	205	36	19	16
181	58	34	29	206	83	43	45
182	70	37	14	207	78	42	42
183	31	24	9	208	53	26	32
184	75	35	30	209	23	15	6
185	25	16	16	210	25	17	5
186	44	24	31	211	65	36	14
187	84	41	26	212	20	11	3
188	122	51	48	213	76	24	7
189	45	30	14	214	44	21	13
190	62	31	21	215	54	22	6
191	59	32	34	216	54	27	12
192	65	35	31	217	36	22	4
193	114	46	62	218	41	26	6

GRADE FIVE (Cont'd.)

Student	Verbal Fluency	Verbal Flexibility	Verbal Originality	Student	Verbal Fluency	Verbal Flexibility	Verbal Originality
219	50	27	9	231	62	16	16
220	53	34	20	232	60	35	30
221	48	21	15	233	38	21	35
222	34	19	6	234	33	19	20
223	29	18	6	235	41	20	14
224	13	10	1	236	30	21	14
225	35	19	11	237	43	18	20
226	82	20	7	238	58	29	45
227	56	27	7	239	40	17	21
228	28	20	16	240	55	29	16
229	36	20	22	241	59	25	30
230	49	26	17				

GRADE SIX

242	59	32	25	268	202	46	23
243	60	20	25	269	26	15	5
244	47	21	14	270	56	21	13
245	71	30	24	271	103	42	32
246	111	47	46	272	96	41	29
247	73	36	14	273	19	15	5
248	70	28	13	274	28	16	6
249	81	39	32	275	26	18	8
250	120	43	43	276	79	38	29
251	119	42	59	277	83	40	35
252	151	48	36	278	64	27	21
253	83	38	25	279	47	32	18
254	36	18	20	280	54	29	14
255	29	19	11	281	76	36	30
256	43	27	13	282	48	27	23
257	121	51	40	283	23	13	10
258	70	30	11	284	60	30	26
259	14	12	3	285	80	41	34
260	82	35	21	286	49	28	24
261	44	26	19	287	15	10	8
262	57	29	20	288	48	26	16
263	35	20	11	289	77	33	19
264	51	26	12	290	61	28	29
265	44	22	12	291	35	18	13
266	26	17	5	292	139	50	93
267	10	7	3	293	50	29	32

GRADE SIX (Cont'd.)

Student	Verbal Fluency	Verbal Flexibility	Verbal Originality	Student	Verbal Fluency	Verbal Flexibility	Verbal Originality
294	130	51	46	333	62	27	18
295	91	36	13	334	98	40	36
296	46	21	12	335	40	19	16
297	33	17	11	336	35	9	18
298	114	52	53	337	76	40	35
299	58	31	23	338	80	34	33
300	58	27	15	339	53	25	10
301	57	30	21	340	72	38	52
302	92	36	53	341	53	29	25
303	69	36	36	342	86	42	40
304	114	48	40	343	99	41	42
305	69	41	26	344	66	28	16
306	152	47	48	345	42	22	25
307	136	61	60	346	65	33	22
308	95	34	55	347	41	18	20
310	67	39	34	348	78	35	36
311	47	27	13	349	63	28	29
312	132	50	41	350	85	30	29
313	112	43	43	351	81	30	30
314	22	12	3	352	124	39	42
315	88	42	48	353	70	26	24
316	101	37	22	354	56	34	26
317	58	36	20	355	59	26	36
318	78	34	32	356	84	30	37
319	104	44	40	357	37	21	24
320	86	36	34	358	79	38	33
321	85	43	33	359	37	11	9
322	44	19	15	360	106	32	33
323	100	35	29	361	50	28	27
324	65	46	27	362	65	28	31
325	75	44	33	363	69	30	14
326	31	16	13	364	43	20	12
327	65	35	25	365	63	45	31
328	72	36	21	366	44	22	35
329	145	39	38	367	63	32	31
330	133	48	41	368	50	40	23
331	32	13	8	369	42	24	29
332	94	43	32	370	54	28	39
				371	78	30	66