

CREATIVITY: ITS APPLICATIONS TO READING

BY

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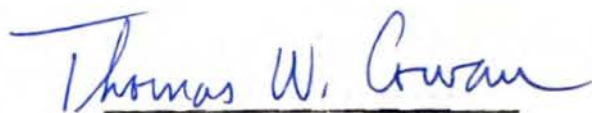
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in Education

by
Brenda Davis Opie
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To the Graduate Council:

I am submitting herewith a Research Paper written by Brenda Davis Opie entitled "Creativity: Its Applications to Reading." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Education.


Major Professor

Accepted for the Council:

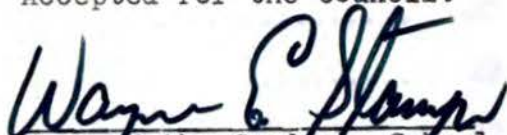

Dean of the Graduate School

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CHAPTER I

INTRODUCTION

Statement of the problem. It was the purpose of this paper (1) to define creativity, (2) to identify assessment measures of creativity, (3) to compare creativity and intelligence, (4) to identify the teacher's role in setting the conditions conducive for creative growth, (5) to present significant features of Project IMPACT, and (6) to show the relationship of creativity to reading.

Importance of the study. A recent study reported that prior to 1950, creativity as a subject for research was largely ignored (Hahn, 40:1). However, in 1950, Guilford (35:153), in his Presidential Address to the American Psychological Association, called to the attention of its members the appalling lack of research on the topic of creativity. He noted that of some 121,000 titles indexed in Psychological Abstracts from its beginning until 1950, only 186 were definitely related to creativity.

Not only has the scene changed since this time, but in the decade of the sixties creativity has become more than a word, "it is an incantation a kind of psychic wonder drug, powerful and persumably painless, and everyone wants a prescription" (Gardner, 28:32).

Yamamoto(100:308), in his survey of research on creativity, has perpetuated the same tone of skepticism as that generated by Gardner. He says, "The field is effervescent and it is not easy to achieve a well-balanced perspective of what is really happening." Perhaps what is really new is the growing realization that creativity exists in every man, not just a gifted few. Dye(27), Anderson(3), Maslow(58), Gowan(24), Schulman(7), Taylor(80), Rogers(66), and others have contributed writings and research in which they supply evidence in support of this theory. An analysis of these studies reveals a myriad of hypotheses; yet, in each study the conclusion was the same—creativity exists in some measure in all individuals. In this study an attempt was made to supply additional insight into the scope of creativity as it pertains to all persons.

DEFINING CREATIVITY

Creativity is a multi-faceted concept which lends itself to a diversity of approaches. Hahn(40:1) has proposed that creativity can be defined as (1) a product, (2) a process, (3) a kind of person, or (4) a set of conditions. Another study conducted by Rhodes(65:305-310) offered similar definitions. Rhodes collected fifty definitions and out of these deciphered four strands in terms of (1) person, (2) process, (3) press (interaction between human beings and their environment), and (4) products as embodiment of ideas.

One of the field's most prolific writers on creativity,

E. Paul Torrance(90:4), is a strong advocate of the process approach. His biases are quite easily seen in his definition of creativity:

. . . . the process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies; identifying the difficulty, searching for solutions, making guesses, or formulating hypotheses about the deficiencies; testing and retesting these hypotheses and finally communicating the results.

MacKinnon's(55:228) concept of the process approach includes the dimensions of originality, adaptiveness, and realization. This process may occur as an act of "effective surprise"(Bruner, 13:3) and it may even appear obscure, unknown, or un verbalized by the person himself(Anderson, 3:35). This act is a "unique response, personal to the individual"(DeBoer, 22:436). Novelty is an outcome of such a process—novelty for the individual as he uses his concept of the world in an effort to satisfy his needs(McCleod, 53:162). But, essential to its development is a background of knowledge and processes. An individual must have the equipment with which he can be creative. Hard work is as much a part of creativity as it is of other cognitive processes. It requires the individual to be self-acting rather than a receptacle of facts. He must be willing to approach a problem from many angles and become proficient in using his background of facts and processes in new and meaningful ways. Thus, this flash of insight or genesis of a novel idea come only after a period of preparation, concentrated effort, withdrawal from the problem, illumination, and evaluation(MacKinnon, 55:229).

Another large body of evidence has been accumulated which supports the theory of creativity in terms of personality traits. The findings of these studies have given rise to the detailed listing of the characteristics of the creative individual. These findings cannot be interpreted to mean that a creative person will exhibit all these characteristics. It is even more unlikely that two persons who have developed similar characteristics would have developed them to the same degree.

Guilford(37:108) has suggested that the "creative disposition is made up of many components and that its composition depends upon where you find it." He further stated that when the problem is approached from the standpoint of individual differences, the most natural scientific technique to apply is that of factor analysis. He has used this approach exclusively in the Aptitudes Project at the University of California and has concurred that creative individuals think with greater fluency, with more flexibility, and with greater originality. A combination of these factors constitute the divergent level of thinking as explained in his "structure of the intellect model." For Guilford, this area seems to be the most important component of creativity.

Lowenfeld and Guilford's findings regarding the characteristics of creative persons have been almost synonymous. This parallelism becomes quite significant when one realizes that Guilford's subjects were engineers and scientists, whereas

Lowenfeld's were art students and artists. The eight criteria proposed by Lowenfeld(52:12-13) include sensitivity to problems, fluency, flexibility, originality, ability to redefine or rearrange, analysis, synthesis, and coherence of organization.

The concept of "openness to experience" as a condition for creativity is receiving much attention in the literature and research on creativity. Abraham Maslow(58) has made a significant contribution to the development and application of this theory. He contends in his theory of "self-actualization" that the need to know, and the need to understand are profoundly rooted in man's biological nature. In this context creativity can express itself in a style of living. It becomes an attitude that everyone can achieve(Steinberg, 77:125).

In support of this theory, Rogers(66:11) maintains that the "ability to be really open to all that is going on in the external and internal world and to react adaptively to it, is perhaps the heart of both creativity and psychological maturity." This concept is most refreshing because it relieves us of presenting a tangible product.

It is apparent that no one definition has been contrived that satisfies all; in fact, researchers in the same field cannot agree on any one definition. Due to these many interpretations, Yamamoto(100:309) has advised researchers to be most explicit in their definition. He says, "There is no absolute need for everyone to agree on a single universal meaning of creativity, but at least investigators should be clear about what they mean by this word."

In the final analysis, Jackson and Messick(47:21)

maintain:

. . . . it is well to remember that theories of creativity are themselves creative products. As such they must abide by the same laws as those they are designed to unearth. The day on which we are certain how to construct a theory of creativity will also be the day we are certain how to construct a poem.

CHAPTER II

CREATIVITY AND INTELLIGENCE

The use of conventional intelligence tests for the identification of creative abilities has come under increased criticism in recent years. Current literature is emphasizing the necessity of using tests designed exclusively for the assessment of creative abilities as replacements for the traditional intelligence measures. The most predominant criticism of the conventional instruments is that high scores on standardized tests do not necessarily imply high creative productivity(Hahn, 40:8).

Discussing the relationship of creativity and intelligence, MacKinnon(57:484) comments:

Over the whole range of intelligence and creativity there is, of course, a positive relationship between the two variables. No feeble-minded subjects have shown up in any of our creative groups. It is clear, however, that above a certain required minimum level of intelligence which varies from field to field and in some instances may be surprisingly low, being more intelligent does not guarantee a corresponding increase in creativeness.

Guilford(35:163) has reported that standardized measures, such as the Stanford-Binet Intelligence Test, assess only a few factors in the structure of the intellect. He further has stressed that different IQ tests concentrate testing on

somewhat different factors and regardless of the emphases they are probably very much confined to the measurement of cognitive abilities to the almost complete exclusion of divergent thinking tasks. He says:

If correlations between intelligence test scores and many types of creative performance are only moderate or low, and I predict that such correlations will be found, it is because the primary abilities represented in those tests are not all important for creative behavior. It is also because some of the primary abilities important for creative behavior are not represented in the test at all. . . . we must look well beyond the boundaries of the IQ if we are to fathom the domain of creativity (Guilford, 37:84).

Getzels and Jackson(31) have also concluded that creativity and intelligence are not synonymous. The results of their study indicated that the highly creative students were just as superior to the total school population on achievement scores as were the high IQ students. This equality existed even though there was a twenty-three point difference between the average IQs of the high IQ students and the highly creative students.

In the Utah reports on creativity, there has been more than one indication that creativity scores and IQ scores are essentially unrelated or at least only minimally related (Taylor, 81). In another recent experiment, Hahn(40) found the correlation between verbal IQ scores, as measured by the Differential Aptitude Test, and creativity measured by the total scores from the Minnesota Tests of Creative Thinking, Abbreviated Form VII, to be .0067. This experiment used a sample of tenth, eleventh, and twelfth grade boys whose

intelligence quotients ranged from the lowest to the highest percentile as defined by the DAT manual.

Yamamoto(100) reported that the correlation between measures of creative thinking and intelligence to be low(.20-.40) in the general unselected population and practically zero in high ability, selected population. He also found that correlations seemed to be slightly higher for girls than boys. Other researchers, Meer and Stein(60), Torrance(86), and True(92) have also submitted evidence which concluded that there is little or no correlation between creativity and intelligence.

Implication. More intensive study needs to be done before we can know the contributions or limitations of these areas one to the other.

Conclusion. To do away with the traditional intelligence measures would not solve the problem of those individuals who are concerned with the assessment of creative abilities. Either intelligence measures need to be expanded to include the factors encompassed by creativity, or reliable and valid tests of creativity need to be constructed. Such tests of creativity have been constructed and even though their use has been limited and their reliability and practicality questioned, the resulting data verifies the inadequacy of the conventional measures for the assessment of creative abilities.

MEASURING CREATIVITY

In as much as creativity is a complex, multi-faceted

concept, measurement of such a concept entails a diversity of assessment methods. Most of the present assessment instruments are designed from Guilford's structure of the intellect model (Yamamoto, 100:312). The prevailing influence of Guilford's philosophy on other researchers and authors justifies an analysis of his theory of creative abilities.

The semantics content slab of his intellect model provides examples of tasks required for divergent production. Such tasks include:

1. Ideational fluency: To produce many ideas.
2. Spontaneous flexibility: To generate many classes subsumed under an idea.
3. Associational fluency: To produce manipulations having an idea in common.
4. Expressional fluency: To produce many sets of ideas.
5. Originality: To produce "effective surprise."
6. Semantic elaborating: To produce many details elaborating an idea (Gowan, 24:12-13).

Guilford's (36) testee may be required to name as many uses as he can of a common brick, or to write as many four-word sentences as possible with no word used more than once, or to list all the antonyms he knows for the word "good." Each of the tasks required by the semantics content slab fall in the verbal category.

Using Guilford's model and adding some tests of their own, Getzels and Jackson (31) developed a battery of tests

designed to measure creative abilities. These tests were first used to identify highly creative individuals in a private school. Conclusions drawn from their study revealed that highly creative individuals are more productive in frustrating tasks and are less creative in closed tasks such as drill. Getzels and Jackson(3) have also designed tests that can be used with elementary school children: (1) Just Suppose Tests, (2) Imaginative Story Tests, and (3) Guess and Ask Test.

Torrance's(90:8) index of creative abilities closely parallels Guilford's: sensitivity to problems, fluency(the ability to produce a large number of ideas), flexibility(the ability to produce a variety of ideas), originality(the ability to produce ideas off the beaten track), elaboration(the ability to fill in the details), and redefinition(the ability to define or perceive in a way different from the usual, established, or intended way). Examples of tasks included in Torrance's tests at the elementary level are: (1) perception of ink-blots, (2) picture construction from dots, squares, circles, parallel lines, and shapes of colored paper, (3) verbalizations while painting, (4) symbolizations of words by lines, and (5) designs from standarized materials.

Torrance(86) used several methods of analyses for obtaining measures for each of the abilities tested. However, in each of his analyses, the testee's responses were assigned values relative to their probability of occurrence.

Hahn(40:6-7) reported the following differences between the tests of Torrance and Guilford:

1. Torrance designed his tests for children using tasks encompassing the entire creative process; whereas, Guilford's tests were developed to assess single factors.
2. More than twenty-five tasks have been identified and employed by Torrance to experimentally test a large range of subjects from kindergarten through college. Guilford's instruments were developed for the evaluation of scientific personnel and their products only.
3. The emphasis in Torrance's research has been on the assessment of a product; whereas, Guilford has emphasized the direct measurement of thought or the cognitive processes which result in a final product.

Other tests in extensive usage are: (1) Minnesota Tests of Creative Thinking, (2) California Mental Maturity Test, (3) Harris Creativity Test of Imaginative Thinking, and (4) Burkhart's Divergent Question Test.

Tests that claim to measure creative ability are under constant scrutiny by researchers and educators. Project IMPACT(62) encountered serious difficulties in using the Minnesota Tests of Creative Thinking for the purpose of identifying creative potential. Such difficulties were associated with requests to do tasks under time limits; start now, stop now. Teachers and school administrators often ignored the specific tasks and time limits imposed by the Torrance tests

and proceeded to build their own tasks at times of their own choosing. The study criticized the concept of structure as found in these tests:

Structure is generally conflicting and contradictory to creative thinking especially in divergent stages. Structure is present from the start in items used on creativity instruments. An item which asks one to list the uses of a pencil, brick, or tin can, or to make up questions about a picture, already has structured the responses considerably.

One of the most urgent needs in this area is the acquisition of additional information on the reliability and validity of the already existing instruments. Investigators need to take stock of what is available in an effort to avoid developing numerous unrelated or private tests(Yamamoto, 100:313).

Non-test ways of identifying creative behavior. Teachers can identify creative behavior in students if they are aware of how it is exhibited. However, Torrance(88), Getzels and Jackson(31), and Goertzel and Goertzel(32) have reported results that indicate teachers seldom enjoy having creative children in their classes. Treffinger(91), in an encouraging note, reported that teacher attitudes toward creativity were improved through inservice programs designed to develop increased understanding of creativity.

Even though Torrance(90:11) advocates the use of creativity tests, he also recognizes their weaknesses as is evidenced in his comments to teachers:

1. Some children are not motivated to perform creatively on tests.

2. Tests usually have some time limit and creative efforts should not be hurried.
3. Some children show their creativity more proficiently through oral communication.
4. Creativity tests require trained personnel: school psychologists, counselors, or others qualified to administer and evaluate such tests.

These factors have indicated a need for non-test ways of identifying creative behavior. Such non-test indicators include:

1. Unusual perceptiveness of relationships
2. Independent, individualistic courageous behavior
3. Originality in behavior
4. Experimentation
5. An overflow of ideas
6. Unusual flexibility in meeting emergencies
7. Constructiveness
8. Daydreaming and preoccupation with an idea or problem.
9. Going beyond assigned tasks
10. Unwillingness to give up

Conclusion. As these creativity assessment measures become more refined and reliable, their use in our schools will undoubtedly become more prevalent. Their major task should be to give the teacher insight into the nature and degree of creativity existant in each child. The teacher can then use

this information combined with her personal observation, anecdotal records, past histories, and her knowledge of creativity in aiding her to more effectively channel each child's creative energy toward meaningful and challenging goals.

CHAPTER III

TEACHING AND CREATIVITY

How to identify and nurture creativity at all levels in our educational system is a pressing problem of our times. We are aware of the complexity of our society and the tremendous demands that are made on its members to cope with burgeoning new knowledge. The need for creative persons who can accept and adapt new methods and are not easily frustrated by new tasks, should be a basic concern of our educational system. This important goal cannot be realized unless we have teachers who are aware of the basic components of creativity, know how to foster creative growth in their students, and possess the skills necessary for evaluating the effectiveness of their techniques.

Research findings—The teacher and creativity. In a study conducted by Denney and Turner(25), three measures were used to determine the creativity level of thirty sixth grade teachers:

1. A battery of tests measuring ideational fluency, spontaneous flexibility, redefinition, and sensitivity to problems

2. Observation of the classroom behavior of these teachers by trained observers

3. Responses of twenty teachers to a characteristic schedule scored by resourcefulness, viewpoint, organization, stability, and involvement

After employment and evaluation of these measures, it was concluded that teacher characteristics and behavior can increase creative behavior in students. Other studies supporting the conclusion reached by Denney and Turner have been reported by Amram and Giese(2), Hallman(41), Torrance(84), and Weber(94).

An inservice training program designed to facilitate understanding of creativity was found to be most effective. The program involved about 250 teachers and administrators representing all grade levels. Several formal presentations on current theory, and research on creativity and problem solving constituted the bulk of the program(Treffinger,91).

Broome(11), however, reported no significant difference between children's adjusted scores in creative thinking when taught by low-creative or high-creative teachers. She concluded that a teacher's own level of creativity neither adds nor detracts from the children's creativity. The only measurement device used in this study was the Minnesota Tests of Creative Thinking. The use of only one device, especially one with so much built-in structure, in categorizing high and low levels of teacher creativity is questionable.

James(41), in another dissertation study, found little evidence of the relationships of teacher characteristics and pupil creativity. However, she did concede that the resulting relationships suggested that with refinement and more rigorous

tests, hypotheses assuming a creative relationship in the classroom could be studied.

Even though research findings do not correlate, the majority of the results seem to favor the hypothesis that teacher characteristics and behavior do influence the student's creative growth. Theories supporting this hypothesis will be explored and evaluated in the following section.

Frank E. Williams(96:12) has suggested that the teacher's role is two-fold:

To diverge his thoughts and create a new idea, a person draws upon stored knowledge and makes new associations. The teacher's problem is to help the child acquire a strong base content and at the same time develop the skills of creative-divergent thinking.

In the above quotation, Williams has implied that to be creative one needs a strong foundation from which to operate. Bruner(14:12), in the Process of Education, has singled out "structure" as the most important component in learning:

Grasping the structure of a subject is understanding it in a way that permits other things to be related to it meaningfully. To learn structure in short, is to learn how things are related.

Thus, it can be seen that the emphasis has shifted from learning knowledge for knowledge's sake to the use of this knowledge in new ways; the application of a learned principle to a new situation meets the criterion of creativity.

What procedures or teaching methods should the teacher employ in order to accomplish the tasks proposed by educators such as Williams and Bruner? Cronbach(21) has emphasized that teachers should not attempt to choose the "best treatment";

instead, they should use the treatment which is geared toward developing the "cognitive needs, abilities, and personality traits of the individual."

Many educators have shown concern as to the type of classroom environment which is most conducive to creative growth. Torrance(87:16) has suggested that whenever teachers change their ways of teaching, a different group of learners become the stars or high achievers. He further has implied that individuals tend to learn most effectively when given opportunities to learn in new ways best suited to their motivations and abilities. His five principles for rewarding creative behavior have implications for both teachers and parents:

1. Be respectful of unusual answers.
2. Be respectful of the unusual ideas of children.
3. Show children their ideas have value.
4. Provide opportunities for self-initiated learning and give credit for it.
5. Provide for periods of non-evaluated practice or learning(85:140-142).

Anderson(3:51-52) has implied that the propitious environment for creativity is the "Personally Open System." This system both permits and stimulates originality, experimentation, initiative, and invention. Examples of the Open System in education can be found in the class discussion, the term paper, student project, seminar or topical report on library reading where the student exercises the choice

of his topic and its development. This Open System operates most effectively when there is an atmosphere of acceptance and a wealth of stimulation from a rich and varied environment (4:33-35).

Suchman(78:9), an advocate of "discovery learning," has found that an important step in entering a new field of study is a period of unstructured familiarizations. He refers to this period as a time for "messing around." However, this time spent should result in the "storing up of a wide range of encounters to be used for the future pursuit of more formal and structured knowledge." Discussion, a second fundamental learning activity, permits the "exchange of encounters and organizers to the mutual benefit of all participants." In discussing this process, Suchman(78:11) says:

In free discussion, as in play, autonomy of control is essential. Each participant is free to give out or take in what he wishes. The forum becomes a 'sounding board' for his organizers and inferences. At the same time, the teacher can observe and feed encounters into the discussion to enrich the entire process.

As a summarization of the teacher's role in furthering the student's creativity, the phases suggested by Demos and Gowan(24:6) possess special merit:

1. Inspiration: This is the kind of teaching which motivates the pupil to learn; in some instances to please and emulate the teacher, or, of equal importance the freedom to verbally disagree.
2. Stimulation: The content of our curriculum should

have enclosed in it stimulating, new and exciting experiences. It is also the "far-off time in space, the realistic, the unusual, the novel, intraceptive, and unhackneyed."

3. Amelioration: Students will not create without the influence of a warm, safe and permissive atmosphere. They need a zone of psychological safety out of which they can step and explore the world but to which they can return quickly when scared or perturbed by their discoveries. The time of creation is a "tender time." Instructors can help by praising initial efforts and by not negatively reinforcing creativity, however crude, by harsh criticism. Of most importance is a general atmosphere of warmth and "even affection." Most everyone, especially the young, tend to "create things for those they love."

4. Direction: The teacher needs to be a "lover of knowledge" and a capable director of the child's talent to an area or level where it will be most effective.

5. Encouragement and development: The final phase of the teacher's role is the encouragement of the developing abilities into a practical channel. Some of this will take the form of "constructive technical criticism" when the pupil is ready for it. Some of it will take the form of referral to competent authorities, to books, or other non-personal resources.

Conclusion. The above phases are indicative of a skillful, yet understanding teacher of children. Her role as a guide to knowledge is a demanding one, but if she succeeds

only in producing youngsters who are a mental index of facts, possibly her efforts possess little virtue. To foster creativity in her students, the teacher needs to motivate and stimulate them to work toward meaningful goals; yet, the real secret of success is the opening up of new avenues by which they can reach these goals.

CHAPTER IV

PROJECT IMPACT'S CONTRIBUTION TO CREATIVITY IN EDUCATION

Project IMPACT is a large scale, federally funded, three year project with the aim of supplying inservice education to teachers to encourage creativity in the classrooms of the school districts in Polk County, Iowa(62). The greatest contribution of this project has been its development of criteria for creativity in the classroom. In addition to this contribution, the project has provided valuable insight into many of the creativity problems encountered in education. For these reasons a brief overview of the project and its contributions to education will be offered in the following section.

The problem. The major task of Project IMPACT was the development and application of a criterion measure by which creativity could be evaluated in the classroom. This task encompassed three areas: (1) a conceptual definition of creativity, (2) a measuring instrument which makes the appraisal of classroom teaching-learning behavior in terms of this definition, and (3) application of the criterion during the first year of the project.

Definition of creativity. In choosing a conceptual definition of creativity, the project explored three alternatives:

(1) the person, that is, his traits and characteristics, (2) the creative process, and (3) the products or productions of creative efforts. The product approach was adopted and it was determined that the actual classroom behavior, when teachers and pupils were interacting, would be considered the product of creativity.

In deciding on an instrument by which creativity could be measured, Trowbridge(62:639), director of research for the project, stated:

At the heart of creativity, as at the heart of learning is the process we call 'thinking.' Any measure of the behavior product of creativity therefore, must somehow ultimately measure thinking processes.

The staff chose Guilford's conceptual definition of creativity, which was developed as part of his structure of intellect model. A brief explanation of Guilford's model is necessary to the understanding of the criterion measure adopted by the project.

This complex model consists of 120 different operations of which the human intellect is capable. Guilford has simplified things somewhat by dividing these operations into five general categories: (1) memorative, (2) cognitive, (3) convergent, (4) divergent, and (5) evaluative. Of these five categories, he has emphasized the divergent thinking processes as being most closely related to creativity(Guilford,37).

Method of measurement. The next step for the project was to find an instrument which could measure the kinds of

thinking occurring in the classroom. The Aschner-Gallagher form of verbal analysis was chosen because this method classifies the verbal expression in an interacting group and does so in terms of Guilford's classifications of thinking.

Trowbridge (62:639) is definitive in her explanation of this method:

The method used in this study involved making a count or tally every 15 seconds. Thus, if divergent thinking was exhibited at a given 15 second mark, a tally was recorded in the divergent category. The tallies in each of the five Guilford categories were then totaled and the results were displayed as percentages. If for example, the memorative thinking category received 15% of the tallies, it was concluded that 15% of the classroom time was devoted to that category of thinking.

The audio tape proved to be the most effective means for carrying out the analyses for it created the least disturbance.

Subjects. Two sample groups of teachers and students were used in the test. A small group of 22 teachers, who were actually participating in the IMPACT program, were selected in order to evaluate the change in behavior of these teachers as they were exposed to IMPACT's instructional techniques. Another larger sample, composed of 108 IMPACT teachers and 114 non-IMPACT teachers, was chosen to see how the classrooms of these two groups differed.

Results—Longitudinal Study. Tables 1 and 2 have summarized results obtained from the study in which data was sought concerning changes of behavior in teachers exposed to IMPACT's instructional techniques. The data used for this sample was derived from an analysis of a one hour audio tape

made in each IMPACT classroom at three times during the year.

TABLE 1

Study over Time: Comparison of Percentages of Teacher- and Pupil- Talking time

Date	Teacher talking	Pupils talking
October, 1967	66.1	33.9
May, 1968	58.6	41.4
July, 1968	42.2	57.8

TABLE 2

Study over Time: Percentages of Classroom Time Devoted to Guilford's Thinking Processes and to Routine

Date	Memory and cognition	Convergent	Divergent	Evaluation	Routine
October, 67	19.2	21.4	10.8	10.3	38.3
May, 68	14.7	12.2	24.1	19.8	29.2
July, 68	14.6	20.3	25.2	26.7	13.2

Cross Sectional Study. Tables 3 and 4 are based on one hour audio tapes made on each of the 114 non-IMPACT classrooms and the 108 IMPACT classrooms in May, 1968.

TABLE 3

IMPACT vs. Non-IMPACT: Comparison of Percentages of Teacher- and Pupil Talking Time

Classroom	Teacher talking	Pupils talking
IMPACT	60.7	39.3
Non-IMPACT	71.2	28.8

TABLE 4

Classroom	Memory and Cognition	Convergent	Divergent	Evaluation	Routine
IMPACT	15.3	26.6	16.2	14.5	27.4
Non-IMPACT	13.6	21.7	12.2	11.3	41.2

Conclusions:

1. IMPACT classrooms spent considerably more time in total thinking processes.
2. Time spent in routine activities was much greater in the non-IMPACT classrooms.
3. A decisive change was evident in the proportion of time devoted to the various thinking processes.
4. An increase in divergent and evaluative thinking was apparent in the IMPACT classrooms.

Implications. Project IMPACT has emphasized for these conclusions to be more meaningful, the same analyses must be continued over at least a five year period.

CHAPTER V

READING AND CREATIVITY

The preceding chapters have dealt with the important aspects of creativity and have offered some applications of these theories to the general framework of the classroom. This chapter, however, deals with the contribution that theories of creativity may make to the reading processes and offers suggestions to enable the teacher to make this contribution effective.

Levels of reading. Research studies and current literature have emphasized the importance of considering reading as a "thinking" process. Stauffer(75:475) says, "It is a procedure whereby the reader acts upon ideas as he reconstructs and regroups experiences behind the language." Torrance(83:547) has suggested that as a person reads, he uses different kinds of mental operations which are dependent upon his motivation, attitude, or set. DeBoer (22:435) implies that it is erroneous to consider reading as being separable from thinking.

These thinking processes that accompany the reading act occur at different levels. Russell(67:305) has offered four levels of reading: (1) association of printed words with their sounds, (2) reading for literal meaning, (3) interpreting what we read, and (4) feeling the "shock of recognition"—seeing a new or important idea in the actions,

characters, or values described. Similarly, Smith's levels closely parallel those of Russell even though they are designated solely for comprehension: (1) literal comprehension, (2) interpretation, (3) critical reading, and (4) creative reading. In the following section consideration will be given to the two areas of critical and creative reading for they are the most pertinent to the development of the problem proposed in this chapter.

Definitions of critical and creative reading. A definition of critical reading entails some aspect of evaluation. Spache(74:463) lists "evaluation of the author's background and intentions, his beliefs and implications" as one of the elements of critical reading. Stauffer(75:475) states:

Critical reading is a process of evaluation. . . . and the test of critical reading is to take advantage of one's compelling experiences, knowledge and values, to examine a hypothesis to find proof, and to examine the capabilities of an author.

Smith(72:255) writes that a reader not only evaluates, but passes judgment on the quality, the value, and the accuracy of what is read. In a research study conducted by Wolf(98:23), a response was considered "critical" if the student went beyond literal meaning, i.e. "if he inferred, interpreted, extrapolated from the facts, detected logical fallacies in the material, or evaluated."

Most definitions of creative reading involve the act of the reader going beyond the author's text. Russell (67:325) has described a shock of recognition as the pupil encounters a new idea or undergoes a new experience.

Covington has proposed that the creative reader tries to build his own meanings. The creative reader accepts, rejects, puts together, raises questions, draws inferences, and comes to conclusions (DeBoer, 22:440).

Although these two areas possess overlapping elements, they remain at variance due to the different uses and functions each represents. Stauffer (75:476) makes this distinction quite effectively:

Critical reading requires knowledge and examined experience, acceptable yardsticks, and a reasonable control of feelings. Creative reading involves a deliberate endeavor to go beyond the information at hand so as to seek out novel ideas or hidden significances and then dealing with them productively.

Critical and Creative Questioning. Many writers have agreed that skillful questioning is a prerequisite for developing creative and critical thinking abilities. Categorizing a question as one which elicits creative responses from critical ones is not an easy task. In a study designed to foster the critical reading ability of elementary school children, it was determined that Guilford's structure of the intellect model could be used reliably in categorizing the separate types of thinking related to critical reading. His five major groups were arranged in a continuum with random responses at Level 1, memory and cognition at Level 2, convergent thinking at Level 3, divergent thinking at Level 4, and evaluative thinking at Level 5. Responses were placed at Level 4 when a child generalized or made unique application of the material read. Level 5 was reserved for responses based upon established criteria that were previously stated. Responses at

Levels 4 and 5 were considered to be the most closely related to the act of critical reading(Wolf,98). In a similar study conducted by Germain and Hunt(29), verbal behaviors were classified according to the amount of student support and type of thought processes evoked(routine, cognitive memory, convergent, evaluative, or divergent). An analysis of the data revealed that teachers who had scored high on critical thinking appraisals spent more time developing skills in convergent, evaluative, or divergent thinking.

Observation of the levels in both of the preceding studies reveals that divergent thinking, as a level, was highly correlated with critical thinking. Authors such as Andrews(5), Burkhart and Neil(16), Covington(19), Cox and Guilford(20), Harding and Parnes(42), Heist(45), and Kagan(5) consider divergency to be most closely related to creative thinking, not critical. These are two significant indications that teachers' questions are difficult to classify as being either critical or creative. Another conclusion that might have been derived from these two studies is that effective teacher questioning is an important phase in the development of both critical and creative reading skills.

The creative atmosphere. What are the ingredients of a classroom where critical and creative reading flourish? Botel's(10:2) prime ingredient is the teacher—a teacher who knows the language and is constantly aware of the needs of children; a teacher who is flexible and can change course

in midstream when the "standard fare" is obviously wrong. He says:

Teachers must all be scholars in a certain sense—not linguists at all. But we must know what linguists are saying in all aspects of language study so that we can have confirmation of what we are doing so that questions can be posed that will give us a chance to re-examine our procedures.

Torrance (Berg, 9:225) has proposed two other ways that teachers can create an environment conducive for developing creative readers. The first is to stimulate their expectation and anticipation; by doing so children may discover new relationships, make predictions, and become responsive to the printed page. The second is to encourage children to do "something constructive" from their reading. Heilman (44:539) suggests that teachers must inculcate children with the idea that all reading should be done for a purpose: pleasure, specific information, personal growth, understanding their world, problem solving, or recreation. For Heilman, the measure of creative teaching is "what the pupils experience."

DeBoer (22:436-441) has emphasized that a teacher should capitalize on the student's existing resources of creative interests in an effort to foster his growth in creative reading. He has also proposed that the teacher's responsibility is to alert the student to some of the major tasks involved in creative reading. These tasks include:

1. Creative inquiry: The student pursues answers to questions he wants answered.
2. Creative integration: A reconstruction of the author's precise meaning occurs as the student builds anew

the ideas of the author.

3. Creative integration: The essential moments of insight transpire when the reader becomes aware of what the various factors pretend. This unexpected perception of the mood, impact, or value of an idea, is meaningful only as it is related to the reader's previous experience, attitudes, and perception of reality.

4. Creative application: The reader must know what the reading matter implies and how these implications can be used in a variety of circumstances.

5. Creative criticism: The creative reader approaches the reading material with a body of values and information which he tests against what he is reading. If the information he has encountered is valid to him, he may see a need to alter his values and correct his information. Such a task necessitates wide knowledge, experience, and clear purpose.

Research: The creative atmosphere for reading. In the Wolf(98) study, it was concluded that "applying-evaluating" questions were more effective in producing critical responses than questions used for gathering information. However, it was also determined that teachers needed to establish a background of information before asking "applying-evaluating" questions. Perhaps it is this neglect of the teacher in establishing a background of information that has served as a basis for Guszak's(38:234) attack on the common practice of asking children for unsupported value statements. Guszak's warning is implicit in the following statement:

It seems imperative that teachers pattern the all important why questions after students take positions. Until such is the common practice it seems that teachers will condition students to take value positions without the weighing of evidence that seems to separate the thinking individual from the mob member.

Project IMPACT(62:24) reported that teachers changed their proportion of talking time so students would have more opportunities to express their ideas and participate freely in class. Students were involved in activities such as exploring novel and imaginative approaches as well as judging or evaluating ideas and alternatives. It was also found that less teacher direction and control was needed. Seventy-five per cent of the teachers involved in this study attributed this transition to a change in their philosophy for these differences rather than a change in methodology or techniques.

An interesting by-product of this study was the significant decrease in time needed for routine activities. Why should an inservice program designed to help teachers increase creativity in the classroom reduce the proportion of time generally used for routine activities? The following explanation was given:

. . . . as an involvement with ideas increased, intrinsic interest in the subject matter under discussion pushed aside ordinary routine matters in much the same manner a detail or interruption is ignored when more absorbing business is at hand There was less need for paper monitors or book monitors or for remarks to 'settle down and start work now;' instead ideas and thinking processes started earlier and were continued while the necessary routine activities were performed(62:24-25).

Current studies, Covington(18), Denny and Turner(25),

Grey(34), and Wolf(98), are including the indirect teacher approach as one of the most effective methods for nurturing creative growth. This approach includes the teacher's ability to accept, clarify, and make use of the concepts and feelings of the students(Stauffer, 75:480).

Stauffer(75:481) offers an excellent summary of the teacher's role in nurturing creative growth in reading. He says:

The instruction to be effective must require pupils to do their own pinning down of problems, raise their own questions and venture their own conjectures. Then it must allow and encourage them to do their own reading, their own exploring, and their own analyzing. The students must weigh the evidence to determine its value. They must identify the promising solution and the new idea. This they must do under the watchful direction of an informed teacher.

Implications. Research is desperately needed in this area. Perhaps the longitudinal studies of Germain and Hunt(29), Project IMPACT(62), and Wolf(98) will provide the framework for future research. It is already apparent that these studies have offered significant insight into the realm of teacher questioning and the levels of thinking this questioning elicits.

CHAPTER VI

CONCLUSIONS AND IMPLICATIONS

This chapter offers only a brief summary of the importance of creativity to education. The author did not deem it necessary to restate conclusions that were drawn in the preceding text, but she did see a need to summarize her feelings about the implications of creativity for the classroom.

To encourage and stimulate a child to strive for excellence in his own individual way may be the most valuable contribution that a teacher can make toward helping a child develop his emotional, physical, and intellectual potential. It is not enough to equip a child with a background of facts and processes if he is unable or does not choose to use his knowledge outside the classroom. We must develop in youngsters a broad sense of judgment, flexibility in thinking, and the skills for problem solving. If we are successful, then the child will be able to use his knowledge in new and meaningful ways.

Perhaps the essential ingredient of applying knowledge in new ways is the creative process. Inherent in this process are the knowledge, skills, feelings, ideas, and thinking that an individual uses to help him solve problems. This process occurs when an individual adapts the known to the unknown, produces a new construction out of existing materials, or

shifts the functions of objects and uses them in new ways.

This creative process is not always indicative of a creative product. Children's movements to music may not result in a final product but the process can be most creative. However, we cannot assume that creativity will develop on its own. Just as a poet cannot compose verse without an extensive vocabulary and an operative knowledge of his language, a child cannot become more creative without a firm foundation built on the understanding of the basic facts and concepts of the activity in which he is about to engage.

The virtues of creativity.

1. Individualized learning is generally accepted as being one of the most important objectives of today's schools. The creative process is an effective means by which this individualization can occur. Through this process a child is free to develop his own ideas without the imposed influence of others.

2. The creative process helps to eliminate the fear of failure. A child needs to feel that his work has worth and acceptance. If the process is emphasized, there will be no predetermined, prefabricated product by which to measure the success or failure of a child's efforts.

3. If the child grows in his ability to use the creative process, competence in his efforts to solve problems will increase. He will be able to see more than one way of approaching his task, and therefore will not be easily frustrated.

The classroom can be thought of as a fulcrum on which creative thinking and its antagonist, complacency, are balanced for every child. We must now recognize that the teacher can and must tip the balance in favor of a creatively thinking child—a child that has a decided advantage in adjusting emotionally to life.

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