Chapter 1

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No nation whether developed, developing or under developed can afford to overlook the importance of divergent thinking in this age of competition who survives this competition largely depends upon its creative minds. The creative acts affect enormously not only scientific and technological processes, but society in general. The nations who learn best how to identify, encourage, and develop the creative potential in their people may find themselves in a very advantageous position. On the contrary, the nations that are still under developed are rather differently motivated towards the identification and development of this rare talent. Prior to 1950, there were only trickle of research articles on creativity. The Russian threat in technological advancement was probably the immediate reason for American Scientists to sensitize the need of creativity in technological competition. The credit goes to Guilford who opened the present era of research in creativity. He in his presidential address in 1950 to the American Psychological Association alerted the psychologists to the need of studying creativity scientifically. It is he, who in his “Structure of Intellect Model”, has effectively redefined
intelligence to include creative behaviours. With a consistent and cumulative effort, he succeeded in evolving a battery of tests, which operationally specify dimensions of intelligence that go for beyond that of traditional tests of intelligence. Using factor analysis, he has isolated 120 separate, measurable factors of mind. Guilford first of all focussed in adults in military establishments and concluded that concern for creativity is a basic concern in the national interest that needs to be and can be productively pursued. Having opened the field to the adults, he also opened it for the children and youth. His concepts and tests were used by educators and others in school situations and devised further tests on creativity.

The educational environment in any society should place a high value upon the divergent thinking potential of its school children. This has been necessitated by the stepped up cultural changes in the world characterised by population explosion and explosion of knowledge, which is becoming specialised day by day due to technological advancements and scientific innovations.

Divergent thinking is regarded the greatest asset of mankind. It is an ability that is most vital for shaping the future of man. Creativity contributes towards the mental health, education, vocational success and many other important areas in life, namely, in the works of great artists, successful painters, scholars and the like.
Creativity has been approached differently by different thinkers. Philosophically, creative thinking is not a peculiar type of thinking that has different non-publicly observable features from other types of thinking. For a philosopher a creative thinker is one whose thinking leads to a result, which confirms to criteria of value in one dimension or another. While discussing creativity, Plato made a distinction between artificial art and true art. He said, artists, for him are those who bring into birth some new reality. They are creative as they enlarge human consciousness. Scientifically, creativity involves an imaginative leap to a new perspective. The scientist searches for a hypothesis, which is likely to fit the facts he is concerned with. Pioneer has expressed creativity as the capacity to be surprised, as many scientific discoveries are made just in this way. The scientist observes phenomenon, which many others before him have without getting puzzled. A scientist has the capacity to be surprised anything obvious for others becomes a problem for him, his mind starts working on it and it becomes the beginning of his discovery. What makes him a creative scientist is only partially his ability to solve the problem and the ability to getting puzzled is largely responsible for making him different from the average scientist. Social scientists approach creativity with respect to interpersonal relationships. For him, creativity is a social invention whose product is not an object but persons, creativity in human relationships. Such a person is regarded creative who is intelligent and possesses sharp perceptions, subtle sensitiveness and respect for the individual
person, boldness to explain one's point of view and to stand for one's convictions psychologists and psychoanalysts have also approached the creativity but they too differ in their views. Some have equated it with mental health; one has related it to the personality development; while others have restricted it to interplay of unconscious and conscious. Sirotn (1959) equates creativity with life itself by virtue of its organising, pattern forming and questing quality. It is only with the imagination, which is a quality of mind, makes possible the creativeness in a man.

Murray (1948) defines creativity in terms of the product. For him creation will refer to the occurrence of a composition, which is both new and valuable. New means that the entity is marked by more than a certain degree of novelty or originality, relative to sameness or replication, and valuable means either extrinsically or intrinsically valuable as such to one or more person or generative of valuable compositions in the future.

Rogers (1957) sees creativity essentially as a process. Creative process, he defines, that it is the emergence in action of a novel rational product, growing out of the materials, events, people or circumstances of his life on the other. Uniqueness of the individual, he refers to man's tendency to actualise himself to become his potentialities. Roll May (1959) considers creativity as process of bringing something new into birth. He says that we cannot speak of a creative person; we can only speak of a creative act. For what is
occurring is always a process, a doing; specifically a process inter-
relating the person and his world. Therefore, creativity is the 
encounter of the intensively conscious human being with the world.

Divergent Thinking is a quality, which each human being is 
capable of exhibiting in his living. Individuals, differ, however, as a 
result of both, nature and nurture, in the amount and kind of creativity 
they display. Furthermore, we believe that creativity can be 
enhanced in most individuals and thus can increase in our society as 
a whole if we put into practice in education what we knew about 
conditions fostering creativity and we continue to study the creative 
process in operation in many types of endeavour.

Researchers also agree that divergent thinking occurs at all 
ages, in some aspects of all cultures, and to some degree in all fields 
of human work and endeavour though these are marked differences 
in the frequency, level and type of creativity across these categories. 
Again, despite the notion that some fields of endeavours require 
more creativity, they may not necessarily do so at all times. Creativity 
bursts, on the other hand, may occur in field not often thought of as 
creative.
The Problem

Over a long period, man has been operating on the erroneous belief that creative behaviour is an all mysterious spark that in a few rare geniuses was added on to the normal aggregate of human potentialities. Until 18th century, it was regarded as the 'work of God'. Poets and dramatists were regarded as the mouthpieces of God. But now the modern psychology has proven that creativity like other mental abilities can be manifested in some way and to some extent by almost everybody. While discussing creativity, Maslow calls an uneducated woman, who is a full time housewife, a creative cook and a perfect tackle of an athlete creative product in every field of human endeavour whether it is soup making of a cook, playing of games, running a business, building interpersonal relationships, teaching and learning and even raising of the children.

Since man's creative product both verbal and non-verbal are quite observable and that man's behaviour which creates these products is also observable is a sufficient clue to realise that creative thinking abilities can be developed to varying degrees among different individuals through a systematically organised programme of education (Rather, A. R, 1998 ). However, one thing remains there that each child cannot be turned into a highly creative person. However, one thing is certain that he at least thinks creatively and uses his creativity in one field or another to satisfy his needs.
Researchers have observed that the children, who have been given training to think creatively, do a job in better way than those who have not been given any such training. It has also been seen that in a longer run, the children lose their ability due to lack of proper guidance and stimulation from their teachers as well as parents.

Kubie (1967) believes that thinking cannot be taught, but the function of education is rather to show as how not to interfere with thinking capability inherent in the human mind. It suggests the feasibility of efforts to remove internal blocks to creativity for promoting creativity rather than to increase the native talent directly.

Since individual variations in creativity are those of degree not of the kind among adolescents and young children, the processes of creativity are capable to be educated.

Many psychologists and educationists conceive creativity as a learned behaviour that can be practiced and mastered through the usual procedures of teaching and learning and through the manipulation of the environmental conditions (Guilford, 1952; Maltzaman, 1960; Torrance, 1962 and 1965; Parnes, 1975). Debono (1970) believes that that external thinking is a skill and it can be mastered.

Guilford (1952) advocates that creative thinking skill can be taught. According to him, like most behaviour, creative activity probably represents to some extent many learned skills. There may
be limitations set on these skills of heredity, but that through learning one can extend the skills within those limitations. Researchers are generally of the view that education can do a great deal in promoting creative performance through manipulating environmental conditions that encourage, facilitate openness in thought and action, and provide for discovery of new ideas. Torrance (1961) stresses that 'perhaps the most promising area in unfolding creativity is that of experimentation with teaching procedures which will stimulate students to think independently, to test their ideas and to communicate them to others'. Parnes (1963) has pointed out that there is no research evidence yet reported that is inconsistent with the view that creative productivity can be developed through deliberate procedures.

**Need, Importance and Relevance of the Study**

Creativity is a valuable asset, which each human being is capable of exhibiting in his or her living. Individuals differ, however, as a result of both, nature and nurture, in the type and kind of creativity they display.

Furthermore, we believe that creativity can be enhanced in most individuals and thus can increase in our society as a whole if we put into practice in education what we know about conditions
fostering creativity and we continue to study the creative process in operating in any types of endeavours.

Guilford 1959 noted that it is not merely the coming of space age and its technology, which has produced the upsurge of interest in creativity but rather the social implications of these advances. Rogers (1959) too related the serious deficiencies in culture to its dearth of creativity and maintains that there is an urgent need for the development of creative behaviour among individuals. Toynbee (1964) opines that the outstanding creative percentage of the population is mankind's ultimate capital asset.

Creativity contributes towards the mental health, education, vocational success and many other important areas in life, namely, in the works of great artists, successful painters, scholars and the like. Torrance (1962) is of the view that nothing could be contributed more to general welfare of a nation and mental health of its people than raising the level of creative behaviour. Barron (1968) is also of the opinion that human creativity may prove to be the key to success or failure in mankind's quest for knowledge, in his journey beyond the bounds of the certain and the seen, in his exploration of the unknown. UNESCO (1974) too is positive in its stand that both knowledge and creativity are useful in itself, but they are also indirect contributors to international understanding and peace.
It becomes imperative to give due recognition to the phenomenon of creativity and its importance in life so that an individual can develop his innate abilities to the maximum and society can also be saved from the stagnation and inertia.

School environment is regarded as an important determinant of creativity. The teacher plays a very important role in providing a conducive climate for creative growth in the classroom.

In light of the findings of different researchers, using if curricular programmes and teaching strategies in the development of creative thinking also suggested in the trend report of the 5th Survey of Research in Education. It is worthwhile and also challenging on part of researchers to explore the effectiveness of different training methods for the development of creativity in the curricular framework at various levels of education in different geographical and cultural settings. In this context, it is worth noting that no such study has been carried out in the State of Jammu and Kashmir, on educationally background areas. In view of this, the present researcher got interested in finding out the efficacy of problem-solving and inquiry training on the development of divergent thinking ability among high school girls.
Statement of the Problem

The problem under investigation was stated as “Efficacy of Problem Solving and Inquiry Training on the Development of Divergent Thinking Ability among High School Girls”.

Objectives of the Study

The following objectives have been formulated for the present study:

1. To study the effect of the teaching through problem solving and inquiry training in comparison to the traditional method of teaching on fluency (word, ideational, associational and expressional), of the 10th grade female students.

2. To study the effect of the teaching through problem solving and inquiry training in comparison to the traditional method of teaching on flexibility (spontaneous and adoptive), of the 10th grade female students.

3. To study the effect of the teaching through problem solving and inquiry training in comparison to the traditional method of teaching on originality of the 10th grade female students.

4. To study the effect of the teaching through problem solving and inquiry training in comparison to the traditional method of teaching on elaboration of the 10th grade female students.
5. To study the effect of the teaching through problem solving and inquiry training in comparison to the traditional method of teaching on total divergent thinking of the 10th grade female students.

6. To compare the effect on fluency (word, ideational, associational and expressional), flexibility (spontaneous and adaptive) and originality of the two groups of 10th grade female students in problem-solving and inquiry training.

7. To compare the effects of elaboration of the two groups of 10th grade female students in problem solving and inquiry training.

8. To compare the effect on total divergent thinking of the two groups of 10th grade female students in problem solving and inquiry training.