

CHAPTER – 2

REVIEW OF RELATED LITERATURE

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CHAPTER - II

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

Creative ability is a characteristic endowment of human being and has been mainly responsible for development of civilization and culture. Creativity is not a newly invented phenomena. The spirit of the present, the emergence of new responsibilities, new social and cultural necessities, deep and tumultuous changes in social mores and objectives, have made creativity a rapidly expanding area of scientific interest. A great variety of studies have been designed and carried out in the area of creativity prediction and also in education and training. The most impressive feature characterizing the area of creativity research is a confluence of interests and its diversity. There are various fields such as : nature of creativity; identification and measurement of creativity; intelligence, achievement and creativity; correlates of creativity; socio-cultural factors and creativity; nurturance of creativity; training of personnels; and systems approach- in which investigators have been carried out through their studies.

The general picture of research in creativity in India is cheerless in the first phase. Up to 1970, only five studies were completed. But the situation is gradually improving. In 1993, as many as 214 research studies have been completed in India, out of a lot of 6531 research studies reported in the five Surveys of Research in Education. The year-wise distribution of studies completed, is shown in the table no. 2.1.

TABLE No. 2.1
Year-wise distribution of the number of studies completed at
Doctoral and Project level in India.

Year	Doctoral Level			Project Level	Total
	Education	Psychology	Others		
1961-70	03	01	-	01	05
1971-80	55	13	04	05	77
1981-90	61	33	09	10	113
1991-93	11	03	01	04	19
TOTAL	130	50	14	20	214

It can be observed from the table no. 2.1 that out of the 214 studies completed so far, 194 have been done at the Ph.D. level and 20 at the Project level.

Looking to the field of studies, it is observed that about 25 per cent research studies have been conducted on identification and measurement of creativity. About 60 per cent research studies have investigated creativity in relation to personality, intelligence and other socio-cultural variables. While, about one-seventh of the studies were carried out in relation to nurturance of creativity, training of personnels and systems approach-even though such areas of research studies are more important. But, it seems that the researchers have realised the importance of creativity related researches.

This chapter provides a comprehensive presentation of research studies to find out effectiveness of creativity programme in developing creativity. While doing so, two things have been kept in mind. One is to show the major trend of researches on creativity over the past thirty years and the second is to find out

research gap which forms the basis of the present investigation.

Keeping in view the area of creativity, some research studies have been reviewed in this chapter. It will help in developing a wholistic perspective and findings of the studies and arriving at the implications for the present study. In view of the variation in the objectives and focus of the studies reviewed, they have been categorised in terms of the following three groups;

- (i) studies conducted on measurement of creativity
- (ii) studies conducted on correlates of creativity
- (iii) studies conducted on development of creativity

It may be mentioned here that, the above classification is by no means an exhaustive one. Further, while going through the review, some studies may appear exclusively on any one section and other may cut across other sections. A detailed discussion of studies reviewed on the above sections, is as follows.

2.2 STUDIES CONDUCTED ON MEASUREMENT OF CREATIVITY

A variety of tests have been developed for measurement of creativity of students for different age-groups. Prior to the development of tests, creativity was studied in small children through drawing, imaginative plays, stories, games, creative writing etc. However, some attempts were made to develop tests of imagination and originality in the west during 1922-1946. Nevertheless, it was the work of Guilford (1950) and his concept of 'divergent thinking'. Besides Guilford, Torrance (1968,1974) devised a battery of tests for measuring creativity on the basis of modifications and extension of Guilford's work. Other investigators like Khatena (1973), Mednick (1967), Wallach and Kogan (1965)

also contributed to the development of creativity tests based on their concept of creativity.

Since the Indian researches in Education and Psychology are mostly confirmity with the psychometric (measurement) tradition, the first evidence of research in creativity have been mainly in the form of test construction. Measurement of creativity through the test approach is an uphill task. However, broad principles for test construction could be established. Based on the lines of Guilford and Torrance, many investigators developed their own tests. Attempts have been made to measure creativity by instruments developed by Mehdi (1973), Passi (1972), Gilitwala (1978), Singh (1978), Jhag (1979), Mishra (1981), Tripathi (1987), and Singh (1988).

Tests were developed to measure general creativity by Mehdi (1970), Passi (1972), Gilitwala (1978), Jhag (1979) and Singh (1988). Some of these tests are verbal whereas the others are non-verbal. Literary creativity tests were developed by Kundley (1977) and Rao (1982). Besides this, tests were developed for measuring scientific creativity by Singh (1978), mathematical creativity by Parasnis (1985), physical science creativity by Gupta (1980) and language creativity by Malhotra and Sucheta (1989). These tests have high reliability ranging from 0.89 to 0.97. Split-half and test - retest methods have been used to established reliability. The sample size for establishing reliability ranged from 150 to 250 students. Most of these samples are drawn from the secondary and senior secondary stages of education. The face validity, convergent validity, discriminant validity, and concurrent validity have been established. Establishing norms is not popular with test constructors. Except Passi (1972) no other study has reported the establishment of detailed norms for creativity tests.

The creativity test responses are popularly scored for fluency, flexibility, originality, and elaboration. Most of these tests have been constructed through the medium of the English and/or Hindi languages. Very few tests have been developed by Kundley (1977), Rao (1982), and Tripathi (1987), in regional languages.

Kaul (1974) had constructed and standardized a test to identify creative children in the age range of 14 to 16 years. The test consisted of five sub-tests viz. (i) Sentence completion test (ii) Uses test (iii) Creative writing test (iv) Consequence test & (v) Problem solving test. Item analysis was done after administering the test to a sample of 350 subjects. The sample for the preparation of norms consisted of 1000 students from the different schools of Delhi. The reliability of the test by using test-retest method was found to be 0.75. The present test gave a correlation coefficient of 0.72 with the Torrance Test of Creative Thinking, 0.13 with a Teacher's rating scale, and 0.26 with the Raven's Standard Progressive Matrices. The test also correlated highly with Shankar's on the spot painting and writing test.

Desai (1987) studied the creative thinking ability of higher secondary school students of Gujarat state. The verbal test of creativity, in which sub-tests included viz. Consequences, Similarities, Novel uses of things, A list of things, To see the deficiencies in a given item and, Responses to the objects - was developed with a view to measure fluency, flexibility and originality. The test was administered on 394 boys and 214 girls of std. XIIth of Baroda district, selected by cluster sampling technique. The reliability of the test by using test-retest and split-half method were found to be 0.83 and 0.824 respectively. The congruent validity of the test was established by calculating validity coefficient of 0.71 with

the test score of Torrance Creative Thinking Ability Test. Also it was found, that the groups based on area (Urban /Rural), sex (Male/ Female) and stream (Science/General) were not differed significantly in respect of creative thinking ability.

Desai (1991) studied the language creativity in Gujarati of students from Std. 8 to 12, with the help of a verbal creativity test. The test was consisted of sub-tests viz. Dialogue writing, Poetry writing, Story writing, Verbal fluency and, Sentence fluency - with a view to measure fluency, flexibility, originality and elaboration. The test was administered on 750 boys and 750 girls of 12 different schools. The test-retest reliability of the test was found to be 0.80. The validity coefficients of the test were found to be 0.41 and 0.48 with the scores on a creativity test and an intelligence test (Desai and Bhatt), respectively.

Parekh (1998) studied Hindi language creativity of pre-service teacher trainees at primary level, of Gujarat State. The developed test consisted of subtests viz. Verbal fluency, Free writing, Dialogue writing, Story writing, Poetry writing. The test was administered on total 723 trainees (361 boys and 362 girls), selected from 16 elementary teachers training institutes by using randomly stratified cluster sampling technique. The reliability of the test computed by Test-retest method, Split-half method, Rulon method, and Flanagan formula were found to be ranging from 0.74 to 0.97. The validity coefficients were found to be 0.46 and 0.54 with the scores on intelligence test (Desai and Bhatt) and marks obtained in Hindi subject in first year P.T.C. . The factorial validity was found to be ranged from 0.55 to 2.26. It was found, that among the groups like male, trainees from urban area, and trainees from Govt. elementary teachers training institutes were at a higher level than their respective group, in respect of

language creativity.

2.2.1 Some observations and implications

With regard to the studies reviewed, it has been observed, that in almost all the studies the common components of creativity like fluency, flexibility, originality, and elaboration were taken under consideration. Moreover, that organisation, imagination, and richness were also studied by one of the researchers. In two studies, the researchers have tried to measure general creativity, whereas the others have studied the language creativity in Hindi and Gujarati respectively. For this, all the researchers have constructed and standardized their own tests of creativity to meet their needs like medium of instruction, conceptual base and age-level of the selected sample. The researchers have selected their sample mainly from secondary and higher secondary school students. Only one researcher has selected sample from professional group like pre-service teacher trainees at primary level.

It has also been observed, that in all the studies, the researchers have developed their tests of creativity only in verbal form. Hence the investigator has constructed and standardized a creativity test both in verbal and non-verbal forms with a view to measure the creativity components viz. fluency, flexibility, originality and elaboration.

On the basis of the reviewed studies and related literature, it was realised that for any type of study, in the field of creativity, a creativity test is a pre-requisite. Without administering creativity test, one could not measure the level of creativity of individuals, which is essential for identification of creativity or studying correlational effects on it or development of creativity also.

2.3 STUDIES CONDUCTED ON CORRELATES OF CREATIVITY

The increasing awareness about the importance of creativity is generating many more research questions. What factors promote creativity? How far do these factors contribute towards the development of creativity? Quite a number of researches have been undertaken on correlates of creativity like age, sex, locality, socio-economic status (SES), birth-order, intelligence, scholastic achievement, values, personality etc. About 60 percent research studies out of a lot of 6531 research studies reported in the five Surveys of Research in Education, are correlational. This is the reliable evidence, that proves the importance of correlational studies. But after all, this type of studies provide the basis for the most important area of research studies on development of creativity. The review of studies conducted on correlates of creativity are presented below.

Qureshi (1980), on a sample of 300 girls of high schools and intermediate classes, selected from Firozabad town, administering Mehdi's test of creativity, group test of mental ability (Jalota), STAT (Sharma, and Singh, Hindi), Level of Aspiration Inventory (Patel) utilizing analysis of variance and coefficient of correlation, found that intelligence, manifest anxiety and aspiration indicated influence on creativity and its components - fluency, flexibility, originality differently; intelligence appeared to be significantly and positively correlated with creativity.

Chadha and Chandna (1990) examined the correlation between creativity, intelligence, and scholastic achievement. The sample of the study consisted of 79 students (42 boys and 37 girls) of Grade XI under the 10+2+3 system from a reputed Delhi Administration school. The tools were used to collect

the data included Torrance Tests of creative thinking, and Raven's Advanced Progressive Matrices. Annual marks of class - XI results were taken from the school records, as a measure of scholastic achievement. Correlation and partial correlations were used for data analysis. It was found that the correlations were positive and significant between creativity and intelligence, creativity and scholastic achievement and intelligence and scholastic achievement.

Yong (1994) studied the relations between creativity and intelligence of 397 Malaysian secondary school pupils. The Torrance Tests of Creative Thinking, Figural Form A and Verbal Form A (Malay Language version), and the Cattell Culture Fair Intelligence Test were administered to 181 boys and 216 girls from five secondary schools located in the urban and suburban areas of Kuala Lumpur and Petaling Jaya in Malaysia. Analysis indicated that scores on verbal creativity were related to intelligence, while those on figural creativity were not.

On the similar line, majority of the studies have reported a positive and significant relationship between intelligence and creativity. Passi (1972), Goyal (1974), Sharma (1974), Bedi (1974), Joshi (1974), Dhaliwal and Saini (1976), Dutt (1977), Singh (1978), Badrinath and Satyanarayan (1979), Gulati (1979), Gupta (1980), Sharma (1982), Chaudhari (1983), Desai (1987), Patel (1988) and Pal (1991) have reported that the highly creatives need not be necessarily highly intelligent.

The relationship between scholastic achievement and creativity has been studied by many Indian researchers. Among them Lalithamma (1973), Jain (1977), Mehdi (1977), Awasthy (1979), Jarial (1981), Dave (1981), Brar (1986), Desai (1987), Gore (1990), Srivastava and Srilatha (1992) reported a positive and significant relationship between creativity and scholastic achievement.

Prabhavthamma (1987) investigated into the creative writing ability of composing a poem and writing an imaginative story in English for student-teachers in India and in Nigeria. She had also studied the effects of achievement in English, sex, medium of instruction, economic status and parent's education on their creative writing ability. The sample selected was 752 B.Ed. students with English method from different cities : Bombay, Guntur, Calcutta, Madras, Delhi, and 50 student teachers from Sokoto (Nigeria). The tools used were interview schedule and oppinionnaire for the creative writers to study the creative writing process; the student - teacher's questionnaire, composing a poem, and writing an imaginative story. The major findings were : (i) Among the five cities, the student teacher's of Bombay were topped in creative writing ability. (ii) The high achievers in English at graduate level were found to be more creative in the poem and story writing. (iii) There was a significant difference in creative writing ability of the males and females. (iv) The significant difference was found between the student teachers of two mediums : regional language and English (v) There was significant difference between high and middle and high and low economic groups. (vi) The attitude and aptitude to creative writing of Indian student teacher's were higher than the Nigerian student teachers, but their experience in creative writing was not more than that of Nigerian student teachers.

Shair (1988) studied creative thinking among boys and girls in relation to their socio-economic status. 200 subjects (100 boys and 100 girls) in the age-range of 14-16 years from twelve schools were selected as the sample for the study. The tools used were Test of Creative Thinking (verbal) by Baqer Mehdi, and socio-economic status questionnaire by Kapoor. Mean, SD, 't' test were used for analysis of data. It was found that : (i) Creativity and SES were positively related. (ii) No gender differences were existed in creativity.

Hussain and Hussain (1975) studied creativity of both male and female students drawn from two cities of two different states of India, with respect to fluency, flexibility and elaboration. He did not find sex differences in respect of creativity. However, Badrinath and Satyanarayan (1979) mentioned that except in case of originality, there was no sex difference with respect to other components of creativity. On the same line Pandey and Pandey (1984) reported that there was no significant sex difference with respect to various creativity factors though it was evident from his results that 10th grade female students mean creativity was significantly higher than 10th grade male students in elaboration. On a sample of 148 adolescents in the age group of 15, from class IXth, from six selected schools, (one boys schools, two girls schools, and three co-educational schools : 74 boys and 74 girls which were selected on the basis of proportionate random sampling). Mehdi's Creativity test, both verbal and non-verbal was administered. It was found that there was no difference in verbal creativity among the tribal boys and girls though the non-verbal creativity of girls was higher than boys (Dutta, 1982).

The relationship between SES and creativity have been studied by Vohra (1975), Rawat and Agrawal (1977), Singh (1977), Thorat (1977), Singh (1978), Srivastava (1982), Sharma (1986), and Kumar (1989). They have reported that creatives come from high SES.

Jain (1992) investigated about the factors such as pupil-teacher's creativity and its relation to their teaching aptitude, teaching skills and personality variables that may reveal useful and new facts which may have a direct influence on the teachability of creativity. 280 pupil-teachers from two colleges formed the sample of the study. The tools used were : (i) Torrance (1974) Test of Creative thinking (Verbal Form A), (ii) Class room creativity observation schedule by Denny,

(iii) Cattell's (1962) sixteen Personality Factors Questionnaire, (iv) Teaching Aptitude test by Prakash and Shrivastava, and (v) Micro teaching Techniques and observation schedule prepared by the researcher. Mean, SD, coefficient of correlation and 't' - test were used for the analysis of data. Positive and highly significant correlation was found between creativity and classroom creativity, teaching aptitude, and teaching skills. Low but positive and significant relationship was found between teacher's classroom activity and teaching aptitude. Out of the sixteen personality factors, positive and highly significant relationship was found with the factors C (Emotionally stable), G (Conscientious), and Q₁ (Experimenting).

Kim, Junghee, and William (1995) conducted a study to investigate the relationship of creativity measures to school achievement and to preferred learning and thinking style among Korean high school students. Subjects were 92 male and 101 female 11th-grade Korean students. Findings revealed that measures of creativity translated from the Torrance Tests of Creative Thinking demonstrated little, if any, relationship to school performance. An investigation of possible gender differences indicated that females may be expected to demonstrate higher average levels of performance on creativity tests than will their male counter parts. Regardless of gender, but especially among females, students classified as demonstrating a learning and thinking style preference hypothesized to be related to right brain dominance are likely to score more highly on creativity measures than will students classified as displaying a learning and thinking style preference hypothesized to correspond to either a left brain-dominance or an integrated brain dominance.

Palaniappan (1998) examined the relationship between figural creativity

and cognitive preferences among Malaysian students. Data were drawn from 165, 23 to 27 years old undergraduate students, who completed the Torrance Tests of Creative Thinking and measures of recall, questioning, principle and application modes from the combined cognitive preference Inventory. Results revealed that figural creativity and its components were not significantly associated with the student's mode of cognitive preferences or their factor scores.

Hota (1998) studied the impact of home environment and institutional climate on scientific creativity of high school students. A total sample of 190 students of Xth grade (100 boys and 90 girls) of secondary schools of Sundergarh district of Orissa was selected by using cluster random sampling. The tools used were Gupta's Test of Scientific creativity, Joshi's Institutional Climate Inventory and, Family orientation scale of Sangeeta Gupta. Two-way and Three-way ANOVA were used for the analysis of data. It was found that family orientation, institutional climate, and sex and single main variable showed significant difference on creativity. The two-way interaction effect of family orientation and institutional climate, sex and family type, sex and sibling position respectively, in relation to creativity were found to be insignificant, whereas significant for type of family and sibling position. Also three-way interaction effect of sex, type of family and sibling position was not found significant.

Fisher, Bradley, and Diana (1999) examined the meanings, older people attached to successful aging and its relationship to creative activity. Thirty-six contributors from senior art exhibition, participated in the study and they ranged in age from 60 to 93. Interviews with participants explored their understandings of successful aging, creativity, the factors viewed necessary for each, the benefits of creative activity and its relationship to successful aging. Qualitative data were

coded by two independent reviewers. Content analysis confirmed six features of successful aging i.e. : (i) a sense of purpose, (ii) interactions with others, (iii) personal growth, (iv) self-acceptance, (v) autonomy, and (vi) health. The findings indicated that creative activity contributes to successful aging by fostering a sense of competence, purpose, and growth. Artistic creativity also facilitates successful aging by encouraging the development of problem solving skills, motivation, and perceptions that translate into a practical creativity in the way those individuals manage their everyday lives.

2.3.1 Some observations and implications

The review of the studies reveals that, the researchers have studied a variety of correlates like intelligence, sex, anxiety, aspiration, scholastic achievement, medium of instructions, SES, teaching aptitude, teaching skills, classroom creativity, cognitive preference, parental education, home environment, and institutional climate etc.. They have studied the correlational effects on creativity and its components, creative thinking ability, creative writing ability and scientific creativity respectively.

Out of the reviewed studies reported here, two studies have supported the superiority of the females over the males with respect to creativity and its components, while the others have reported that there exists no significant difference between the male and female students. In respect of this the observation is made by Torrance (1969) that, "Adequate understanding of the relationship between creativity and sex is necessary in developing and fostering creative thinking abilities of students. Over emphasis or placed emphasis on sex role however, does exact its toll on the creativity of both the sexes and does create serious problems of adjustment for highly creative individuals of both the sexes."

The majority of the reviewed studies reported a positive and significant relationship between intelligence and creativity. But, it was in respect of verbal creativity only. As far as the figural creativity is concerned, there was no positive and significant relationship found between intelligence and creativity.

The various correlates like scholastic achievement, home environment, medium of instruction, parental education, institutional climate, cognitive preference, teaching aptitude, teaching skills, personality factors, classroom creativity and SES were positively correlated with the respective creative ability as described in the studies which were reviewed.

It was observed that all the researchers have adopted the standardized tool for their research purposes. Also they have restricted their sample mainly upto secondary, higher secondary and undergraduate students. Only one researcher has employed the sample drawn from student - teachers at secondary level population.

It has also been found by reviewing the studies that so many factors which contribute towards the creative thinking ability and its development. Hence while conducting researches in the field of creativity with the help of a variety of correlates need to be taken care of. Thus it is obvious to say that one can not study any research problem effectively, related to creativity and innovations without considering some correlates. The reviewed studies and literature have provided an important guidelines to the investigator, in this regard. Hence, in the present study the correlates like previous scholastic achievement, caste category and academic stream of the PSTTs were considered during the process of investigation.

2.4 STUDIES CONDUCTED ON DEVELOPMENT OF CREATIVITY

Innovations are the key to progress in all areas. Progress in education, also is closely linked with innovations in the field of education. Hence there has been a consistent cry for innovations to improve the quality and standard of education, to harness education to solve the multitude of problems that our society is facing and to serve the cause of social and national progress. Creativity alone can infuse the spirit of innovation. Looking to this reality and increasing awareness about the importance of creativity, the major thrust of researchers has been increasing on the ways and means of creativity development at all levels, for last two decades. There are a large number of methods and techniques for developing creative thinking. Some of these have been tried out by different researchers in the field of education. The review of some studies conducted on development of creativity are presented below.

Deshmukh (1979) studied the relative effectiveness of brain-storming and role-play techniques to develop creativity in the secondary school students of Nagpur. Brain-storming technique was found to be relatively superior to role-play in terms of significant difference on creative test and the techniques created conditions also which helped to increase creativity of the students. He also reported that a strategy of learning Marathi and Social science involving brain-storming and role playing has significantly enhanced creativity of the students.

Ryar and Michale (1988) prepared a programme for developing Creative Thinking Ability (CTA) and tried out on 330 students of grades V ,VI, and VII of three schools , out of which one school was treated as control group and the other two schools as experimental group. The tools used were verbal and non-verbal creative thinking ability criterion tests developed by the investigator,

anxiety scale, self-sufficiency scale, self-done activity scale, parental behaviour scale, neuroticism scale, happy-go-lucky scale and I.Q test. It was found that the experimental group gained more than the control group. The CTA treatment was found to be effective when the different variables like anxiety, parental behaviour, self-done activities, school achievement, self-sufficiency, neuroticism, emotional stability and I.Q. were controlled.

Bhaskara (1981) prepared a verbal creativity training materials. These were originally developed in Kannada language as the investigator felt that children can express themselves much better in their own mother tongue than in a foreign language. The creative materials included consequences situations, puzzles, riddle construction, riddles, divergent problems, story writing with a view to develop fluency, flexibility, originality, and redefinition. These materials have been tried out on VIth std. students in both urban and rural areas and were found to be effective in raising the creativity score of the students.

Tripathi and Shukla (1990) developed instructional material for promoting creativity of IXth std. students. The effectiveness of the instructional material was studied in terms of using creative methods of teaching biology, giving greater scope to divergent thinking and imagination in the day-to-day teaching of biology. Two groups-experimental and control were identified on the basis of pretesting involving intelligence, achievement in biology and creativity, and formed as the sample. The tools used were intelligence test, achievement test, and Torrance and Ball tests of creative thinking. Mean, median, SD and factor analysis were used for the analysis of the data. The major findings were : (i) There were certain dimensions of creativity that could be developed through a training programme, however, for some other dimensions which failed to register any noticeable

impact of the training programme. (ii) The training programme did not show any significant gains in terms of originality score.

Srivastava, Sushila and Srilatha (1992), studied the impact of an enrichment programme to foster creativity among academically gifted elementary school children. Seventy gifted children in the age - group of 7-12 years, from three schools of Madras city were selected as the sample. The tools used were Wechsler Intelligence scale for children, Wallach and Kogan Battery of creativity Instruments adopted by Parmesh, and enrichment experiment to foster creativity in gifted students. Mean, SD, correlations and 't'-test were used for the analysis of data. It was found that the enrichment programme affected sufficient improvement in the creativity level of the students. There were significant impact of sex and intelligence on the creativity gain scores of gifted students, respectively.

Shetty (1993) studied the effectiveness of the programme conducted by Nehru Science Centre in developing scientific creativity among the secondary school students. Sample selected for the study was the group of students attending the programme at the centre, mostly from Std. 8th to 11th. The tools used were Passi's Test of creativity, observational scale and a scientific creativity test developed by the investigator to measure scientific creativity. "Pre-test Post-test" design was adopted. Analysis of the data was done by comparing test scores with observed characteristics according to the characteristics enlisted in the observational scale. It was found that the creativity level of the students was improved with the help of that programme.

Patel (1993) prepared a programme on creative thinking. Programme consisted of a bunch of 25 items focussing on the lives of great people and on

events from the world history, to study its effectiveness. A total of 162 boys and girls from 4 classes of Std. Vth, of Gandevi Taluka of Valsad district were selected as the sample for the study. Out of 4 classes two classes were treated as experimental whereas the other two classes were treated as control group. "Pre test - treatment - post test" design was adopted. The creative ability test of Patel (1987) was used to measure creativity of the students. A 2 x 2 factorial design was evolved and ANOVA was used to analyse the data. The main effects of implementation of thinking programmes was significant for the creativity and its two components viz. fluency and originality, while the third component i.e. flexibility level could not enhanced by this programme.

Thakar (1996) examined the effect of an encouraging environment and appropriate training on creative writing ability of the students. A total of 180 (95 boys and 85 girls), XIth std. students of two Gujarati medium schools of Ahmedabad city were selected as the sample for the study. The tools used were Dave's test of creative thinking ability, Intelligence test (Desai & Bhatt). A 3x2x2 factorial design was evolved and ANOVA was used to analyse the data. It was found that the training was effective and there were no significant effects of Sex, Caste and Parental education on creative thinking ability. But, there was significant effect of intelligence on creative thinking ability.

Pillay (1978), Nair (1978), Shah (1981), vora (1984) Talegaonkar (1984), Gupta (1985), Singh (1985), Nandanpawar (1986), Patel (1987), and Amin (1988) tried creative thinking programmes, and teaching strategies. They found that fluency, flexibility, originality, language proficiency and mathematical creativity can be developed among secondary students.

Another group of researchers ; Pillay (1978), Miyan (1982), Yawalkar

(1985), Patel (1988) and Jawaharlal (1990) applied brain storming and morphological analysis as experimental treatment techniques for enhancing creativity and divergent thinking in secondary school students. They found that the applied techniques were effective in enhancing creativity and divergent thinking.

While realising the role of media, Ponnuswamy (1980) and Sharma (1986) used audiovisual methods and media techniques. The students were exposed to different visuals and asked to express their ideas in different ways. On being tried through creativity tests, the treatment was found to be effective.

Mandal (1992) evolved an autonomous creativity cultivation programme for school students and found it not to be effective for creativity development. At pre-service level, Martis (1991) trained student teachers for the synectics teaching model. She found that a training treatment consisting of theory, discussion, demonstration and practice helped in developing teaching competence. The student teachers trained through the synectics model developed fluency, flexibility and originality. Apart from these findings, Martis demonstrated that creativity oriented teacher training is possible provided one desires to implement it.

Sharma (1994) conducted an experimental study by organising activities like brain-storming, problem-solving, quiz, and project work in a science teaching class. She found after the investigation that the students of the experimental group showed significant gains with respect to verbal fluency, verbal flexibility, verbal originality and non-verbal creative thinking.

How can schools enhance an individual's creative potential ? There is an empirical evidence to show schools can play a major role in encouraging creative development. Irving Maltzman and his associates (1960) found that when

subjects were instructed to be original and were given instruction requiring originality, they were better able to solve problems later requiring original responses.

Regarding the improvement of creativity in the classroom, Van Deren (1967) divided 215 seventh grade students into matched control and experimental groups. He pretested both the groups for creativity. The experimental group teachers were then given instruction in the nature and development of creative thinking. After this instruction, these teachers produced students who did significantly better on post test creative results. On the basis of this study, he has suggested that all teachers be given training to improve creativity in the classroom.

Mccormack (1969) stressed creative thinking in a science method course for pre-service teachers. An experimental group, trained in using divergent thinking, scored significantly higher than a control group on a measures of creativity and an affective rating. Sacco (1976) supported student teachers with training and individual conferences as they effectively used divergent thinking with elementary students.

A meta analysis was conducted to examine the impact of instructional programme across a wide range of studies, Rose and Lin (1984) reported that training does effect creativity. They acknowledged that creative thinking is both a skill and an innate ability. The skills can be developed and the innate abilities can be stimulated and nourished through education and training.

Statsionos (1986) assesed a training programme for the development of creativity and self-esteem in mentally handicapped Greek children. Verbal and figural sub-tests selected from Torrance Test of Creative Thinking (TTCT-1968) and Copper Smith's (1967) self - esteem scales, were used to measure creativity

and self-esteem respectively. New Dimensions in Creativity (NDC) programme was used for 16 weeks. The analysis indicated that the experimentals made significant improvement on the five out of seven factors of creativity as well as on subjective self esteem.

Manning and Perlmutter (1988) conducted a study to facilitate creativity of student-teachers through post observation conferencing. The experimental group was given post observation conferencing. The experimental group was given post observation feed back using De Bono model and the control group received a post observation feed back using check-list with supervisor explanation for ratings. Analysis of the preassessment of both the groups indicated no beginning differences between them on any of the development measures of creativity. Results comparing the treatment and control group revealed that the De Bono group was significantly more flexible, fluent, original and elaborate than the control group, and also had significantly higher total scores on creativity.

The studies conducted by Balagtas (1969), Dewing and Taft (1973), Domino (1979), Drayer and Wells (1969), Ellinger (1965), Springer (1961), Getzels and Jackson (1961), Datta and perloff (1967) revealed that a greater freedom is related to higher level of creativity in children and adolescents.

Crabtree (1967) showed that a programme structured by both pupils and teachers resulted in greater creativity than a similar programme planned entirely by the teacher.

Barker Lunn (1970), Butt (1972), Haddon and Lytton (1968), Hyman (1978), McCormac (1978) revealed that open education was associated with higher creativity scores and that these effects were long-term.

2.4.1 Some observations and Implications

The review of studies related to the development of creativity reveals that creativity of the individuals can be developed and foster with the help of various techniques and training strategies. Some of the researchers have implemented various techniques like Synectics, Brain -storming, Problem-Solving, Quiz, Project - Work, Role-playing and Use of audiovisual methods and media techniques; while the others have implemented creative thinking ability programme, creative instructional materials, enrichment programmes, scientific creativity programme, and creative writing ability programme as the training inputs for their studies. They all have found that their training inputs were effective in terms of developing creativity and its components viz. fluency, flexibility, originality, elaboration, and redefinition.

The various training inputs implemented during the process of investigation in the reviewed studies were based on different activities like consequences situations, puzzles, riddles, divergent problems, story writing, poetry writing, riddle construction, creative methods of teaching science, lives of great people and events from the world history, novel uses of the things, and teaching model with theory, discussions, demonstration and practice. But, it was observed that the training inputs were based on the selected number of techniques ranged from one to four as well as on the specific subject. Keeping all these in mind the investigator has prepared the creativity programme based on various primary school subjects and existing curriculum of the PSTE course. It was also related to ten different techniques for creativity development. And two types of approach were adopted namely; activity based and workshop approaches, for its implementation.

The sample selected by the researchers in the reviewed studies were from the population groups like primary, secondary, higher secondary school students, pre-service teacher trainees (B.Ed.), and inservice teachers. In respect of the study related to the inservice teachers, it was found that after providing instructions to the inservice teachers, the teachers produced their students who did significantly better on post - test creative results. This was one of the important observations for the investigator which provided motivation to him for selecting such type of study.

One of the major objectives of developing creativity among the subjects, in the reviewed studies, the creativity was measured by adopting standardized tool and the study of some correlates like anxiety , parental behaviour, self-sufficiency, neuroticism, emotional stability, sex, intelligence was also taken under consideration by the researchers. These experimental researches have provided a required guidelines for the present investigation. Hence the similar method was applied with a little change that is the measurement of creativity with the help of constructed and standardized test of creativity, by the investigator.

2.5 THE PLACE OF THE PRESENT STUDY IN THE CONTEXT OF RESEARCHES REVIEWED

From the review of studies under three categories mentioned earlier in this chapter, it can be observed that there is a dearth of studies in the area 'development of creativity'. Such an observation can be made by the sheer presentation of certain facts from the educational surveys like the number of studies available in the creativity and innovations (214) in general and in the area 'development of creativity' (35) in particular. Looking to more specifically, out of these 35 research studies, no study is available in respect of creativity

development of the PSTTs at primary level. Further, it can be observed that a very few studies have concentrated together on areas of research study like measurement of creativity, correlates of creativity and, development of creativity. In the present study all these areas have been considered together.

Very few researchers in the past have developed their own tests of creative thinking ability, to measure the level of creative thinking ability of the subjects. But, in the present study the investigator has constructed and standardized the creativity test in verbal and non-verbal forms, especially to measure the creativity level of the PSTTs at primary level so as to meet the needs like medium, concepts of creativity and its components, and the age- level of the sample.

The earlier investigations have mainly attempted to see the effectiveness of the treatment given for the development of creativity in students at primary, secondary, and higher secondary level. All these investigations have established the fact that creativity is teachable, educable and can be developed through training. But, on the other hand if creativity of the students has to be developed, it is needless to say that the teachers have to be creative. So in the present study an attempt has been made to develop creativity of the PSTTs with the help of a creativity programme, keeping in mind a fact that a creative teacher who serves as a model for the creative child and the demands for a creative teacher, who, in turn, can very easily identify, nurture and develop the creativity in the students.

With regard to the treatments given, in the earlier research studies, it was found that they were of short- duration. But, in the present study the total time duration for the implementation of creativity programme as a treatment was of 76 hours. Also, instead of studying the effectiveness of the isolated methods or tech-

niques or teaching strategies related to any selected subject for developing creativity, the present study has tried to investigate the effectiveness of the creativity programme based on various school subjects and existing curriculum of the PSTE course. While developing this creativity programme the interdisciplinary activities and their relevance with various techniques of creativity development and instructional setting have been taken under consideration, the details of which will be found in the relevant chapter.

In the end, it can be stated that, no study has been attempted which takes care of the three major areas of study together like measurement of creativity, correlates of creativity, and development of creativity especially for the pre-service teacher trainees at primary level. In this direction, in the present study an attempt has been made to take care of these lacuna found in the existing literature. In the following chapter, a detailed description of construction and standardization of the creativity test, preparation and implementation of the creativity programme has been given. Further, the methodology of studying the effectiveness of the creativity programme in respect of some variables have been discussed in greater detail.