

CHAPTER II

REVIEW OF RELATED LITERATURE

2.0.0 Introduction

Every research project should be based on all of the relevant thinking and research that has preceded it. When completed, it becomes part of the accumulated knowledge in the field and so it contributes to the thinking and research that follow. For any specific project to occupy this place in the development of a discipline, the researcher must be thoroughly familiar with both previous theory and research (Fox, 1969).

The specific reasons for reviewing the related literature would be the following : It (i) provides a background for several conceptual and functional details; (ii) reveals the gaps in the area and helps to specify the scope of the study; (iii) helps to justify the relevance of the problem ; (iv) enables the identification and definition of variables; (v) aids the formulation of hypotheses; (vi) helps to programme the approach; (vii) helps to select the suitable instruments; and (viii) helps to develop the whole design of the problem at hand. In short,

review of related literature offers empirical support to the study, at various stages.

It was in 1950 that Guilford in his presidential address to the American Psychological Association alerted the psychologists to the need for the work in the field of creativity. He emphasized the 'appalling neglect' of the study of creativity, indicating that ^{of} some 121,000 titles indexed in ' Psychological Abstracts ' from its beginning until 1950, only 186 were definitely related to the subject of creativity. Since then, considerable amount of research work has been done in this field, much of which has relevance to education. Some of the important milestones in the creativity research are : (i) the researches done by Mackinnon (1962), Roe (1952) and Barron (1955), who studied the personality structure of highly creative adults who had become well-known for their creative production like outstanding creative architects, writers and scientists; (ii) the correlational study by Getzel and Jackson (1963) showed that when traditional measures of intelligence alone are used to spot out the able students, 'the cream of the student crop in creativity' is missed; (iii) development of tests of creativity by Torrance (1966), Guilford (1964) and others; and (iv) programmes for stimulating creativity like Brainstorming

(Osborn, 1971), Attribute listing (Crawford, 1954), Morphological analysis (Zwicky, 1969), Synectics (Gordon, 1971) and many others.

In the present review, studies related to instructional materials have been emphasized, owing to the nature of the investigation. The studies on fostering creativity could be categorised as using (i) techniques of fostering creativity, like Brainstorming, Synectics, etc. ; (ii) instructional materials for fostering creativity, like Purdue creative thinking programme (Feldhusen, 1970), Package programme by Covington and Crutchfield (1965) and etc. The studies in the same way can be classified as Indian studies and Foreign studies. The investigator has placed emphasis more on the development of instructional materials with respect to foreign studies and has considered different types of them, which have been used to foster creative abilities of children. The review has been organized historically but groupwise, so that their distinctive characteristics could be seen forthwith, and certain conclusions arrived at.

The Indian studies have been reviewed separately. Apart from the two-types of the studies mentioned above, research efforts made at the teacher education level also have been

reviewed. The M.Ed. dissertations and ongoing researches too have been included to get a comprehensive picture of creativity fostering researches in India.

2.1.0 Studies Abroad

2.1.1 Studies Based on Flexible Programmed Instruction

Covington and Crutchfield (1965) have devised auto instructional programmes composed of detective and mystery story materials, which they gave to fifth and sixth grade children. The results revealed that the subjects who used the programmes markedly performed better than the control subjects on certain problem-solving, creativity and relevant attitude measures.

Olton (1967) investigated mainly the extent to which thinking and problem-solving of fifth grade students could be improved by the use of self-instructional programmed lessons (The productive thinking programme). A total of 704 students participated in this project. The results showed statistically significant increments in thinking and problem-solving performance on a wide variety of productive thinking measures. These instructional benefits occurred for virtually all types of students regardless of sex or general I.Q. level, and were especially marked for students in classrooms having

environments which were providing little support and encouragement for the development of productive thinking.

Wardrop and others (1969) conducted a controlled experiment in forty four fifth grade classrooms to investigate the extent to which creativity and problem-solving skills of children could be nurtured through a series of self-instructional programmed lessons developed by the investigators. Significant differences were found favouring the experimental group, which received the programmed lessons. Improvements in productive thinking skills were found for both boys and girls of both higher and lower I.Q.

Shackel and Lawrence (1969) developed an auto-instructional programme that attempted to increase the factors of creativity, viz., fluency, flexibility, originality and elaboration. They found that the six programmed textbooks, they devised were found effective.

Sharpe (1975) tried to enhance the verbal and figural creative abilities of educationally handicapped (EH) children, using brainstorming and programmed instruction techniques. Nine intermediate grade EH classes were randomly assigned to four experimental treatments, viz., (i) brainstorming, (ii) programmed instruction, (iii) combination

of brainstorming and programmed instruction, and (iv) control. The programme lasted for eight weeks. Alternate forms of Torrance Tests of Creative Thinking (TTCT) were administered as pre- and post tests. Post hoc tests of significance showed that the brainstorming group scored significantly higher than the programmed instruction and control groups on verbal fluency and verbal flexibility. The same group scored significantly higher than programmed instruction group on verbal originality. The three experimental groups scored significantly higher than the control group on figural fluency. Only brainstorming group scored significantly higher than the control group on figural flexibility. There were no significant differences between the treatment groups on figural originality or figural elaboration.

The above five studies have one thing in common, viz., all have programmed instruction as an independent variable. Sharpe (1975) has added brainstorming as an additional independent variable. All the studies have pointed out that programmed instruction could be a robust form for fostering creative abilities of children. A caution, which all the investigators have observed is that, they have not considered programmed instruction in the strict sense of the technique. Each one entails with it suitable modifications depending upon the type of the material, the investigator intended to present.

The point of importance has been, as to how the construct of creativity has been presented through the technique of programmed instruction eventhough they seem to be in opposing to each other. The programmed lesson is well-sequenced and structured form of instructional material, but creativity is known for its unusual, off-beat, apparently non-logical form of responses. The programming of the material has been done flexibly and in the deviated form, so that it could have the unusual responses as well as original responses in its fold, but not always. The flexibility of the programming has been carefully done so that it neither jeopardises the principles of 'programmed instruction' nor does it spoil the construct of 'Creativity'. That is, sufficient freedom has been allowed to the students to express freely but remain and progress in the structured sequence. The common factor between the two, viz., Creativity being generally individualistic and programmed lessons requiring individual working at his own pace, might have produced positive and consistent results. This seems to have extended to educationally handicapped children too, as evidenced by the study of Sharpe (1975).

2.1.2 Studies on Purdue Creative Thinking Programme

The Purdue Creative Thinking programme consists of a series of twenty-eight audio tapes and, for each tape, a set

of three or four printed exercises. Each of the twenty-eight lessons is designed to foster the divergent thinking abilities of verbal and figural fluency, flexibility, originality and elaboration and consists of three parts. The first part is a three-to four - minute presentation giving specific suggestions for improving one's creative thinking skills and emphasizes the value of creative thinking. The second part is a ten-minute story about a famous American pioneer like Columbus, Abraham Lincoln or George Washington, etc. The third part of each lesson, the printed exercises, is based on the lesson's story. Children are frequently asked what they might have done if they had been the people in the story. The motivation is for many alternative solutions instead of a single solution or correct answer. Some exercises are designed to strengthen verbal fluency, flexibility, and originality while others provide figural fluency, flexibility, originality and elaboration (Torrance and Torrance, 1973).

Williams (1977) while reviewing the studies, reports that Purdue Creative Thinking programme developed by Feldhusen, et al (1970) has been found effective in studies by Bahlke (1967) and Feldhusen, Badhlke and Treffinger (1969). Only for this programme have separate components and combinations of components been evaluated. The exercises seemed to come out

best in these evaluations, and the presentation of principles of creative thinking poorest (Torrance and Torrance, 1973).

Allencar (1974) studied the effects of the Purdue Creative Thinking programme on pupils' creative thinking abilities of fourth and fifth grades of public and private schools of Brazil. Reinforcement of pupil's performance was another variable of the study. Two experimental groups with and without reinforcement and one control group were studied. The children in the experimental groups heard story of a famous American pioneer, from the teacher, and worked on some creativity exercises. The investigator concluded that the Purdue Creative thinking programme had a positive effect on the development of pupil's creative thinking abilities. The experimentals outscored the controls on figural fluency, flexibility and originality for the task 'lines' and verbal fluency and verbal flexibility for the task 'unusual uses', on Torrance Tests of Creative Thinking (TTCT), Reinforcing pupil's performance on the creativity exercises did not result in greater gains from the programme than using it without reinforcement. It was also found that teachers ratings of the children's creative abilities were not correlated with the children's performance on the Torrance Tests of Creative Thinking.

Sherief (1979) randomly assigned classes from four Egyptian public schools to three experimental conditions (within schools) : (i) Purdue 'Creative Thinking programme (PCTP), with a permissive and supportive atmosphere; (ii) PCTP with restricted atmosphere; and (iii) Control group with no creativity training. All subjects were pre-tested on (i) Group embedded figures test to identify field-dependent and field-independent subjects, (ii) Two subtests of Torrance Tests of Creative Thinking (TTCT), one figural and one verbal. After six weeks of training with PCTP, all pupils were administered another form of TTCT, with two figural and two verbal tests.

The results indicated that Purdue Creative thinking programme was effective in enhancing and improving the creative thinking abilities of Egyptian elementary children. The permissive type of classroom atmosphere was more effective for enhancing creativity particularly for field-dependent children, than the restrictive type of classroom atmosphere.

Jaben (1980) stimulated the creative thinking of learning disabled experimental children, using the Purdue Creative Thinking programme, comprising 28 audio tapes, and exercises aimed to develop divergent thinking. A group of

learning disabled control children and another group of normal children acted as the control group. A clinical problem-solving task was administered as a post-test to ascertain the effectiveness of creativity training to extend to problem-solving skills, along with a different form of Torrance Tests of Creative Thinking (TTCT). Analysis of the data revealed that learning disabled children can be taught creative verbal behaviours as measured by the TTCT, and that creativity training effectively extended to problem-solving skills as measured by problem-solving task.

The above studies clearly show that Purdue Creative Thinking programme is well suited for fostering creative abilities of children. Jaben's (1980) study indicates that the programme is equally effective with learning disabled children also. Apart from studies in U.S.A., the studies have also been carried out in Brazil and Egypt, where fruitful results have been obtained. This indicates that Purdue Creative thinking programme seems to be a culture-free programme, which can suit to any culture in producing similar effects of enhancing the creative thinking abilities of children. This might as well hold good in India, but the cost of the programme, viz., that of 28 audio tapes and printed exercises is rather prohibitively high.

Torrance and Torrance (1973) in their review of 142 studies, have considered 25 experimental studies involving complex programmes with packaged instructional materials. The three main programmes have been : (i) the Covington, Crutchfield and Davies productive thinking programme; (ii) the Purdue Creative Thinking programme; and (iii) the Myers and Torrance idea books. In the evaluations, each of these sets of materials scores fairly well, especially when there is class and teacher involvement in their use. Without this involvement the 'percentage success' comes down. The 'percentage success' for these and other programmes together has been 72% .

2.1.3 Studies on Creative Problem Solving

Parnes (1971) discusses in detail the procedure of creative problem-solving course at the University of Buffalo. The pupils are taught the technique of brainstorming in detail, with the use of check list procedures and forced fit techniques. Importance of record keeping, deferred judgement, free wheeling, etc., are stressed and informal procedures are used in the training. Analysis of the results indicate that; (i) the creative problem-solving students show substantial gains in quantity of ideas on two tests, than the control group; (ii) on three tests of idea quality, the creative problem solving students showed clear superiority, but on a fourth

test the difference was not significant; (iii) on three tests of personality to measure 'self-control' and 'need to achieve', the creative problem-solving students gained substantially in dominance, but showed no significant changes in 'self-control' or 'need to achieve'.

Biles (1977) took forty graduate and professional students and randomly assigned them to two groups. As many as 23 subjects took the creative problem-solving course based on the textbook by Osborn (1971) and the work-book by Parnes (1967) for 10 hours. The Torrance Tests of Creative Thinking (TTCT) were selected as the criterion for evaluating the outcomes of the course and the two forms were used. The experimental subjects benefitted from the experience in terms of significant improvement on scores for two of the three verbal factors and one of the four figural factors.

Kealey (1977) used a pre-test, post-test control group design, with 18 foreign language student teachers at Ohio University. The experimental treatment received by the group 1 consisted of a six-week abbreviated version of Parnes (1967) creative problem-solving course. The control condition A₂ consisted of seminar sessions in which specific student teaching problems were discussed. Verbal creativity was measured by Torrance Tests of Creative Thinking (TTCT) and

operational creativity, by student ratings on a tool developed by the investigator. Results indicated no significant differences between groups on either TTCT or on student ratings, but significant correlations existed between the two, Torrance tests and student ratings.

The results of the three studies with common creativity fostering materials, suggest that the creative problem solving course is an effective one. Torrance and Torrance (1973) in their review of 142 studies provide 91% success for Osborn-Parnes Creative Problem-Solving Course and/or modifications. The study of Kealey (1977) suffers from some shortcomings like, size of the sample, duration of the experiment, abbreviated version of Parnes book being used, etc. But the ratings of students' operational creativity is an interesting idea, which could be investigated further. The reasons for the success of creative problem solving courses are : (i) the problem solving is very much similar to the creative thought process itself; (ii) the solving of creative problems are enjoyed by the children because of the novelty of problems.

2.1.4 Some Special Studies on Fostering Creativity

The studies included in this section have all been separate ones, employing different approaches to fostering creative abilities, and as such do not come under a common

heading. Even a study of teacher training input has been included, as it measures the effect of it on students.

Torrance (1964) cites the study of Anderson (1963) in which the investigator employed 3 conditions, sample being a class of general education course in industrial arts. In addition to usual control condition, he gave brief creative thinking exercises in one condition and in the other, he merely handed out from time to time sheets giving information about the creative process, becoming more creative and the like. No classroom time was devoted to the discussion of these sheets. Any discussion that was held was among the students and on their own time outside class. Students in this latter condition showed significantly greater growth in measured creative thinking abilities than their peers who had not been given these handouts.

Parnes (1967) after reviewing over 40 studies concludes: In so far as existing tests adequately measure creativity, the evidence overwhelmingly indicates that creative productivity can be increased. A few studies further demonstrate transfer effects that extend beyond the existing tests.

Davis (1971) developed a programme in the form of dialogues among four characters, a scientist-inventor, a relative of a

famous secret spy and others, with humour as an ingredient. The characters try to become idea-finders and use 'attribute listing', 'morphological synthesis', 'checklist procedure' and 'Synectics'. The report of the pilot investigation indicates that 23 students who used the programme produced 65% more ideas on three divergent thinking tasks, than 32 control students. Their attitudes too had changed favourably. A field test with 197 average and disadvantaged sixth and eighth grade students showed less striking, but still measurable improvement in divergent thinking scores and in creative attitudes as a result of training with this programme.

Callahan (1973) used the 'New Connecticut Mark I Creativity programme', and attempted to find the effects of this programme on creative thinking of sixth grade students. The results indicated that there was a trend toward high mean scores for experimental group.

Johnson (1975) investigated the effects of special guided lessons in creative thinking, prepared with the help of 'classroom ideas for encouraging thinking and feeling' by Williams (1970), upon the creative thinking ability, achievement and intelligence of randomly selected 353 fourth grade students in 20 classrooms. Also investigated were the differences in creative thinking abilities between male and female experimental

subjects. Significant F ratio was found in favour of experimental group on total creative thinking, as well as on the tests of flexible thinking and elaborate thinking. The control group did significantly better on the test of fluent thinking but no significant difference appeared between the two groups in case of original thinking. No significant difference was found between the groups in the areas of intelligence and achievement. An analysis of variance between experimental boys and girls revealed a significantly high F ratio for girls on total creative thinking and on the test of flexible thinking.

Ford (1976) in her study on educable mentally retarded (EMR) children tried to find the effect of 'New Directions in Creativity Programme Mark I', in terms of their : (i) creativity scores, (ii) attitudes towards the school, and (iii) ratings of creativity characteristics. She randomly assigned thirty middle grade (6 - 10th grade) special education classes to experimental (N = 18 classes) and control (N = 12 classes) groups. Post-test only control group design was used, as these children were within the State's definition for the educable mentally retarded (EMR).

Christensen and Guilford's Creativity tests, Erlich's 'Inventory of Attitude Toward School' and Renzulli's Scale for Rating Creativity Characteristics' were used to collect the

data. The conclusion was that the EMR students who had worked with new directions in creativity programme : (i) achieved higher scores on creativity than the control students, (ii) exhibited more positive attitudes toward the school than the control students, and (iii) exhibited more creativity characteristics than the control students.

Blakenship (1976) investigated the effects of 10 hours of creativity training comprising 15 activities, upon the creativity performance, achievement and self-concept of first graders. Four classes with each of 24 pupils were randomly assigned to an experimental and a control group, with two in each school. The pre-test post-test parallel group design was used by the researcher to arrive at the following conclusions. The analysis of variance indicated that the experimental subjects made significant improvements on fluency, flexibility, originality and elaboration. But they did not improve significantly on reading achievement, math-achievement or self-concept. The control group did not improve significantly on any of the variables.

Harmon (1976) studied the influence of exploratory writing experiences on the creativity of third grade children. As many as 60 children of a public elementary school were randomly assigned to experimental and control groups. For a period of six weeks, the experimental group received intensive instruction

in creative writing for 30 minutes each day, in addition to the established language arts curriculum. The control group did not have the additional instruction in creative writing. Both the groups were pre-tested and post-tested on alternate forms of Torrance Tests of Creative Thinking (TTCT), viz., Thinking creatively with words. Analysis of the difference between means of students in experimental and control groups on fluency, flexibility and originality measures, showed that a significant difference existed in originality measure. Statistical analysis of the interactions of the effects of instructional method, race and sex, revealed that no significant difference existed.

Moore (1977) in her study investigated the differences in the student performance with a group having teachers training input of a theoretical nature and a group using the creative activities programme, consisting of varieties of materials from Williams, Torrance and others. One hundred and forty fourth graders were pre-tested and post-tested with the Torrance Tests of Creative Thinking (TTCT). The nonparametric statistical analyses were used to analyse the data. The conclusions were : (i) creative abilities can be increased by the use of formal and informal materials; (ii) teacher background of a theoretical nature does make a difference in the classroom performance of the students. The second evidence

is of special importance to India. As India is a developing country, it may not be in a position to earmark resources for developing creativity instructional materials and their experimental validation. If the input of theoretical nature could be given to teachers through orientation programmes and workshops, we may be able to find its effect on the students in the classrooms.

Khatena Joe (1977) reports that through a special training programme, the experimental group was taught to use the Simile, Metaphor, Personification and Allusion as comparison forms within the four analogy classifications, namely, Direct, Personal, Symbolic and Fantasy analogy and to differentiate between simple and complex images in the production of analogies. Generally high and low creative experimentals obtained significant originality scores than high and low creative controls; experimentals and controls preferred to use direct analogy, simple image patterns to other analogy - image forms; and high creatives of both the groups, produced more complex images than the low creatives of both the groups; and only one symbolic analogy and a few fantasy analogies were produced by both the groups, with experimentals producing more fantasy analogies than controls. Although the training programme significantly increased mean originality, scores, it did not serve the

function of significantly increasing the use of personal, fantasy and symbolic analogies.

Radis (1977) tried to determine if enhancement of children's imagination by activities like records of radio programmes such as 'The shadow and suspense' and games from the book 'put your mother on the ceiling, could improve their creative abilities. The sample of 25 children were pre-tested and post-tested on the same form of Torrance Tests of Creative Thinking (TTCT). Four times during the experimentation of 8 weeks, children's creative writing was analysed for certain fantasy factors, along with the record and type of library books borrowed. The conclusions were : the imagination enhancement materials did not significantly affect verbal creativity scores, but they did in figural creativity, especially fluency, which was significant at 0.001 level; there was no generalised trend in choice of reading materials and the creative writing showed no fantasy factors, the stories, however became longer and were written less in narrative style and more as dialogues.

Organ (1977) in her study had 80 second and third grade children ranging in age from 7.6 through 9.6 years, who were randomly placed in two groups, experimental group (20 girls and 20 boys), control group (20 girls and 20 boys). The experimental subjects were introduced to a creative thought production instructional programme, which composed of (i) a time period for group discussion, and (ii) a presentation of motivational

model charts developed by the investigator and administered by four trained research assistants. The control group received a comparable period of group discussion and visual stimulation, without systematized instruction by the class teacher. The programme lasted for 5 weeks of 40 minutes per day. The children were pre-tested and post-tested on figural forms, A and B of The Torrance Tests of Creative Thinking (TTCT). The analysis of variance revealed that there was a significant difference on fluency, flexibility, originality and elaboration scores between the experimental and control groups with different programmes. There were no significant sex differences and there was no significant interaction between the sex and treatment on each of the four measures of creative thinking.

Davis and Bull (1978) in their study on 87 and 60 undergraduate students provided 5 week course which was a mixture of academic material and hands-on involvement activities. The course covered such topics as creative and problem-solving processes, the creative personality, creative dramatics, creative thinking techniques, brainstorming, etc. The critical affective component was explicit in creative personality and brainstorming. Class A took 'How do you think' (HDYT) on the first day and 'Adjective Checklist' (ACL) on the last day. Conversely class B took ACL on the first day and the HDYT on

the last day. For both groups and therefore both tests, the trained subjects scored significantly higher than their respective before training controls. In both the groups, the training effect was stronger for females than males. The ACL - creativity appeared to be more sensitive to creativity training, which may be due to the large number of biographical items in HDYT. Presumably such items are less susceptible to creativity training.

Jones (1978) had four groups of eleventh grade American History students, who were divided into control groups A and B and experimental groups A and B. The treatments were administered by Teacher A and Teacher B with each one having one control group and one experimental group. The treatment consisted of ten divergent questions drawn from colonial and revolutionary era of American History. The Torrance Tests of Creative Thinking (TTCT) verbal form A and B were employed as pre - and post - tests, the dependent variable being fluency, flexibility and originality. The conclusions were :

- (i) the teacher is a significant factor in obtaining effective creative development,
- (ii) the divergent questions were significant in the development of creative thinking, but were dependent on teacher variable,
- (iii) the teacher of creative classes should be flexible and allow the students opportunities for free expression.

Lofton's (1978) sample consisted of 78 fourth and fifth graders, who were randomly assigned to two groups. Group 1 participated in a creative reading programme and Group 2 continued their usual instruction as outlined in the Houghton Mifflin basal series. Knowledge of basic relationships of language was tested by a language inventory, the creative thinking abilities by Torrance Tests of Creative Thinking (TTCT) form A, and literal and inferential comprehension by New developmental reading test for intermediate grades (4, 5, 6) form A. After 10 weeks of training, post-tests form B's latter two tests were administered and three creative reading tasks designed by the investigator - The Asking task (asking questions about what the story does not tell), the Adding task (adding new ideas to the story content), and the changing task (modifying or changing the story content). The originality of the adding and changing tasks was assessed by Torrance's supplementary scoring guide for the evaluation of originality and interest. The results were : (i) students participating in the creative reading training programme performed significantly better on two of the creative reading tasks: asking questions and changing task ; (ii) the true difference between the groups on the third task could not be found out due to failures; (iii) students of the experimental group scored significantly better on the originality of the creative reading changing task, but there was no difference in case of creative reading asking task;

(iv) mean differences between two groups on creative thinking abilities of fluency, flexibility and originality were not statistically significant; and (v) differences for literal and inferential comprehension were not statistically significant.

Olson (1978) aimed to study the Kindergarten children giving fantasy literature programme with or without related follow up activities and the concomittent increase in creativity scores. Fantasy literature was defined as imaginative fiction containing phenomenon not found in the real world. The subjects were 38 boys and 46 girls in four classrooms taught by two female teachers. Torrance Tests of Creative Thinking (TTCT) forms A and B were used for testing and initial matching of the groups. All subjects composed endings for two stories; one stem sentence was given as pre-test and another stem sentence was given as the post-test. Results showed that there was no significant differences between groups in a majority of the categories of the Torrance Tests. It was also found that there was a trend in all the groups and in all categories for the post-test scores to be lower than the pre-test scores. An analysis of the stories showed that both the groups made gains from the pre-test to post-test, but the greater gains were made by the experimental groups. It was concluded that this creativity measure may have been more appropriate for use with kindergarten children than was the Torrance battery.

Schneider (1978) gave the treatment comprised of 18 activities from the talent areas of productive thinking and

forecasting for a nine week period, while the control group received no treatment. The sample was 191 fifth and sixth grade pupils from six rural elementary schools. The experimental group consisted of 40 males and 58 females and control group 51 males and 42 females. All subjects were pre-tested and post-tested on Torrance Tests of Creative Thinking (TTCT) and the Coppersmith self-esteem inventory. The major conclusions were : (i) the activities employed in this study can affect significant gains in flexibility and total creativity scores, but not on fluency and originality; (ii) the activities had no effect on self-esteem scores; (iii) girls at the fifth and sixth grade levels scored higher on verbal creativity measures than boys; and (v) there was a relationship between creativity and self esteem, but was weak.

Fairchild (1978) tried to investigate if the creative potential could be increased in 'low-creative' gifted fifth and sixth graders by a programme of specific instruction in creativity developing activities and if choice of leisure time activities would change as a result of these experiences. 112 experimental and 105 control students were given pre-tests and post-tests of the investigator's value preference scale and Mctfessel's project potential. Prior to post test both experimental and control group were given 18 weekly sessions of 40 minutes in divergent and convergent activities respectively.

Both groups were divided into thirds on the basis of pre test scores, the bottom third being designated as 'low-creative'. The major conclusions of the study were : (i) although low creative divergent students did raise their creativity scores, convergent students did also. The activities presented were not responsible for increased scores; (ii) females were more responsive to activities than males; (iii) attitude change toward creative activities (a) is internally not externally changed, (b) requires a different measuring instrument, (c) takes longer than the study allowed; (iv) improvement only inflexibility seems to negate the value of these creativity developing activities in similar situations; and (v) this particular programme was not successful in significantly raising creativity scores of low creative students.

Teeling (1980) investigated the effect of a process approach to teaching creativity on the creative thinking performance of third and fifth grade students. The process employed was Multiple talent approach to teaching. 226 third and fifth graders underwent the treatment using a pre-test, post-test control group design. The major conclusions were : (i) the girls appear to benefit more than boys from the multiple talent approach to teaching; (vi) fifth grade students appear to benefit more than the third grade students; and (iii) the creativity test score gains favouring the experimental students seem to

justify the conclusion that it is potentially possible to enhance creative thinking through a teaching process.

2.1.5 An Overview

Foregoing examination of related literature shows that programmed instruction approach, Purdue Creative Thinking programme and creative problem solving approach have had more number of studies under them, 5, 5 and 3 respectively. All the remaining studies have used different approaches, characterising the nature of creativity itself. Except the studies of Kealey (1977), Olson (1978) and Fairchild (1978), all the studies have shown positive results regarding the effectiveness of one or the other types of approaches / instructional materials. Studies based on programmed instruction are successful, eventhough the concepts of programmed instruction and creativity seem to be apparently opposing ones. This emphasizes that even to achieve a creative thought, the knowledge in the beginning has to be structured. How one jumps from structured information to unusual one, depends upon the creative ability of the child and other factors.

Creative problem solving has produced consistent results owing to the nature of the problems, humour, nature of the brain-storming sessions, and informal procedures that are followed. The way the highly creative people think, is emphasized, along with record keeping of the ideas (Idea - trap). The

creative problem solving institutes of University of Buffalo have been very popular and are being regularly conducted.

Purdue Creative Thinking programme, with consistent results in the studies at U.S.A., Brazil and Egypt, shows the advantage of the programme being culture-free. The studies have shown that this programme could be successfully used with learning disabled children also.

Other studies range from simple giving of information to children for enhancing creative abilities, to creative thought production programmes for enhancing creative abilities. Different types of activities and questions have been used by Johnson (1975), Blakenship (1976), Organ (1977), Davis and Bull (1978), Jones (1978), Schneidef (1978) and Fairchild (1978)¹/₂. That is, many researchers have emphasized different creative activities to be performed in the class to foster the creative abilities of children. It is nothing but training in creative thought process itself. The present investigator falls in line with these investigators in terms of activities to be performed by the children, questions to be answered, etc., in the class.

Reading and writing have been emphasized by Harmon (1976), Radis (1977), Lofton (1978) and Olson (1978). That is, provision of fantasy literature, exploratory writing have been used by these investigators. The present investigator too has

provided fantasy literature in terms of stories, and writing exercises in terms of stories to be completed, poems to be written, etc.

Torrance's (1964) study is of importance, as the investigator has provided information on creative process, creative products, creative persons, etc. Davis (1977) study had 'humour' as an ingredient in the instructional materials, he developed. This idea has been taken care of, as and when possible in the present investigation too. Fairchild's (1978) study is of special importance because of the emphasis placed on the low-creative students, whereas, Khatena Joe (1977) had studied two levels, high and low. The present investigator has studied students of all the three creativity levels, viz., high, middle and low. The significance of Khatena Joe's (1977) study is in the use of analogy forms, which has been included in a different way in the instructional materials, viz., in the construction of riddles.

Teachers rating of creativity characteristics of children was followed by Allen Car (1974), Ford (1976) and Kealey (1977). This implies that the behavioural changes that are produced because of the treatment with instructional materials could be rated and significance of the difference between the ratings could be worked out.

Significant difference from the pre-test to post-test were found in the mean creativity scores of females over males in the studies of Johnson (1975), Davis and Bull (1978), Schneider (1978), Fairchild (1978) and Teeling (1980), but no significant differences were found between females and males in the studies of Olton (1969), Wardrop and others (1969) and Organ (1977). In the light of the above studies, it will be interesting to investigate the effect of verbal creativity instructional materials on males and females. The Indian social set up also has to be considered, while interpreting the results of the study.

Eventhough Schneider (1978) took the sample from the rural area, no comparison between children belonging to rural and urban areas, with respect to enhancement in creativity scores has been made.

Nearly 50% of the investigators have made use of Torrance tests of creative thinking and many times the alternate forms have been used. The pre-test, post-test parallel group seem to have been the favourite of many investigators.

The present investigator too has used tests similar to Torrance tests of creative thinking, viz., Passi tests of creativity and as alternate forms were not available, the same tests have been used during the pre-test and the post-test. The

investigator has fallen in line with majority of the investigators in using pre-test, post-test parallel group design.

Many of the investigators have used the developed programmes, like, Purdue Creative Thinking programme, New Connecticut Mark I programme and others. But others have developed new programmes, like the studies on flexible programmed learning, and by Davis (1971), Blankenship (1976), Radis (1977), Organ (1977), Davis and Bull (1978), Jones (1978) and others. The longitudinal and case studies seem to have got less importance by researchers. The case study approach would have ^{been} more suitable in the studies of Ford (1976), who investigated the effect of 'New directions in creativity programme, Mark I on educable mentally retarded children and Jaben (1980), who used Purdue Creative Thinking programme on learning disabled children.

The studies of Davis (1971), Radis (1977) and Kealey (1977) suffer from a shortcoming, namely, very small samples, Davis had used 23 students, Radis had used 25 students and Kealey had used 18 students to test the effectiveness of their programmes. The conclusions drawn from such studies have less generalisability, compared to other studies, where large number of students had been used as samples.

On examination of the above studies, one important thing becomes apparently clear that hardly any study had

socio-economic status as a variable. Socio economic status becomes an important variable because the shaping of the children in the homes depends upon that. A study of different levels of socio-economic status in terms of enhancement in creative abilities would be very much necessary, as the way in which children take to the instructional materials or technique depends upon their socio-economic statuses.

2.2.0 Creativity Researches in India

The last decade has seen a sharp increase in the volume of research on creativity with a major emphasis on constructing the tests of creativity (Mehdi, 1970; Passi, 1971; Kaul, 1974; Ramachandrachar, 1975 and others) and correlational studies of creativity with self concept (Guptha, 1977 ; George, 1976), personality traits (Raina, 1968; Verma, 1973; Joshi, 1974 ; Goyal, 1974 ; Gakhar, 1975, Gopal, 1975 and others), Correlates of creativity itself (Raina, 1968; Sharma, 1971; Rao, 1976 and others). Buch (1974,78) Unfortunately there has been little research on the general problem of nurturing and promoting creative thinking, especially in the classroom setting. Some efforts that have been made or being made would be reviewed here. Keeping the nature of present investigation in consideration, emphasis

has been placed on the intervention studies on fostering creativity.

2.2.1 Studies on Brainstorming and Related Techniques

The first group of studies were on brainstorming and related techniques. Deshmukh (1979) studied the relative effectiveness of brainstorming and role playing techniques in the secondary school children of Nagpur. Brainstorming was found to be relatively superior to role playing in terms of significant differences on the creativity tests. A point of special importance in this study was, the investigator surveyed the instruction in schools, to find out the plug points, where creativity fostering could be put.

Pillay (1978) found that creative teaching method, that is a combination of Brainstorming, Morphological synthesis and Traditional method, did not produce differential effect upon general creative thinking and on its sub-parts such as seeing problems, unusual uses and consequences of eighth graders and upon creative thinking in geography too, with respect to traditional method.

D'lima (1981) used Brainstorming for development of creative thinking in children through B.Ed. trainees, as an institutional project at Bombay, Sequential brainstorming was done by B.Ed. trainees on a topic of family planning to

arrive at ideas for 24 - 25 cartoons. The transparencies of these cartoons were used again by the children to brainstorm, so as to improve them. A criticism of this approach has been that it is not culture-free. But a good beginning was made by the investigator to use creativity training in teacher education programme, so as to develop creative thinking in school children.

2.2.2 Studies on William's Model

The second group of studies were on William's Cognitive-Affective Teaching Model. Sunaree (1977) prepared lesson plans, based on the above model to foster creative abilities of children. Eighteen plans were developed, each one on paradoxes, Attributes, Analogies, etc., for VII standard children of Thailand. All of them are culture-free and could be used in Indian classrooms, without much expense also. But an experimental validation of these plans has not been attempted yet. Ramkishan's (1979) study has been on the same model, but to develop general and scientific creativity through teaching of science in IX standard.

2.2.3 Some Special Studies on Fostering Creativity

The remaining studies were all separate studies having varied types of techniques or instructional materials.

Nirpharake (1977) in his pre-test, post-test matched group study, had 6 boys of VII standard in each group. One was control

group, whereas the remaining four took one programme each, viz. training in creative perception, training in divergent production, training in creative appreciation, and training in creative problem solving, the sixth group took training in all the four areas. Results indicated that training programmes appreciably improved the creative thinking of the subjects on Torrance Tests of Creative Thinking (TTCT). Training in the areas other than divergent production contributed significantly in the improvement. The group which had training in all the four areas outperformed the remaining groups.

Jerial (1981) took immediate problems (verbal and non-verbal) of the environment, some divergent and some convergent and developed 25 lesson plans. Each lesson had four steps, viz., preliminary work, introduction, statement of the problem and exercises. The item was presented on the first day and the discussion was held on the second day. Gains on Torrance Tests of Creative Thinking (TTCT) form B, compared to form A were highly significant.

Mathur (1979) has taken up two apparently contradictory concepts, viz., Mastery learning and Creativity development. The investigator has been experimenting in 20 schools, the subject being Physics.

Another study in the field of science has been that Shah (1977) who is investigating experimentally the effects of selected teaching strategies on development of creative thinking and achievement. A criticism of this study has been that the investigator has not used the standardized instruments to measure creativity.

Bheemaiah (1978) prepared instructional materials for teachers, on the skill of guiding discovery, for developing creative abilities in children, as a part of her M.Ed. programme. The attempt was similar to that of Sunaree (1977) but with a different basis. The content validity was established, and it was experimentally validated also.

In a project by Department of Educational Psychology and Foundations of Education (NCERT, 1981), Transcendental meditation was found beneficial in enhancing creativity, but it was not significantly effective in increasing the intelligence and academic achievement in high school children. Sansanwal, et. al. (1980) have also explored the possibility of using Transcendental meditation, for enhancing the creativity of school children. But the basic process involved in Transcendental meditation is difficult to define, and the experience that is got by the individual is highly individualistic and influenced by his personality characteristics. Therefore, the difficulty

is felt by researchers in bringing Transdental meditation into the research model.

The creativity teaching unit in Aligarh Muslim University has floated an innovation which is being tried out with batches of 12 B.Sc.(Hons) students each of whom has opted for Physics as the main subject. The experimental and control groups have to follow a common syllabus, but the treatment will be different. The experimental group will have questions, self-study and other curricular modifications. This experiment, being a longitudinal one, will require some time before the results are published (Ahmed and Jaffri, 1973).

2.2.4 An Overview

Educational research in general and creativity research in particular, are of recent origin. As in any case of research the measurement has recieved primary importance by researchers. The second place is taken by correlational studies. But in all the above studies the Indian researchers have followed foreign know-how, ideas, constructs, etc. It is hopeful sign that creativity fostering researches are gradually receiving the importance due to them. Three studies completed at the Ph.D. level on fostering creativity are by Nirpharake (1977), Pillay (1979) and Deshmukh (1979). One important

research gap is that the instructional materials / ways and techniques suitable to our setting have not been developed. The possible reasons for this lack of attention are : (i) the very construct of 'Creativity' has many definitions and there is little conceptual agreement among the researches; (ii) developmental researches of creativity fostering nature are time consuming and require theoretical basis also.

Hardly any attempt in Indian setting has been made in creativity fostering researches, with respect to important variables, viz., sex, levels of socio-economic status, different levels of creative potential and rural-urban backgrounds and others. The present investigation is a modest venture in this direction.

2.3.0 Implications of Related Researches for the Present Study

The foregoing discussion of the researches related to 'fostering creativity' (sections 2.0.0 through 2.2.4) Crystallised some of the issues and observations that may help formulating hypotheses for the present study. The implications have been mentioned below :

- (i) In respect of research studies, it may be said that they have adopted different approaches to foster creativity, but a generalisation could be arrived at, viz. that it is possible to foster creativity of children, as evidenced by the significant increases in scores on creativity tests.

- (ii) Creative thinking could be enhanced by disciplined procedures like training in creative problem-solving, creative writing exercises, development of imagination, etc.
- (iii) The factors of creative thinking, viz., fluency, flexibility, originality and inquisitiveness are to be reflected in the verbal creativity instructional materials.
- (iv) Teachers' rating of creativity characteristics of students could also be a viable tool of measurement, and so could be used before and after the application of creativity fostering treatments.
- (v) The important variables, viz., sex, levels of creative potential, socio-economic statuses, rural-urban background have not been studied together in hardly any of the studies so far. This has been the basis of the present investigation.

2.4.0 Hypotheses

On the basis of the rationale of the study as well as the review of researches related to the problem of investigation the following hypotheses have been formulated. For the purpose of testing the hypotheses they have been stated in the null form.

1. There will be no significant difference in the effect of verbal creativity instructional materials on the students of different creative potentials.

2. There will be no significant difference in the effect of verbal creativity instructional materials on the students of different socio-economic statuses.
 3. There will be no significant difference in the effect of verbal creativity instructional materials on the students of rural and urban backgrounds.
 4. There will be no significant difference in the effect of verbal creativity instructional materials on male and female students.
 5. The effect of verbal creativity instructional materials will not be significant on the students of different creative potentials with regard to their different socio-economic statuses.
 6. The effect of verbal creativity instructional materials will not be significant on the students of different creative potentials with regard to their rural-urban backgrounds.
 7. There will be no significant effect of verbal creativity instructional materials on male and female students of different creative potentials.
 8. The effect of verbal creativity instructional materials will not be significant on the students of different socio-economic statuses having rural-urban backgrounds.
 9. There will be no significant effect of verbal creativity instructional materials on male and female students of different socio and economic statuses.
 10. There will be no significant effect of verbal creativity instructional materials on male and female students of rural-urban backgrounds.
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