CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter will be devoted to present the review of related literature. It includes a brief summary of some researches, directly related to creative thinking. This survey is useful from several points of view. The researches done previously help us to verify our results. It also gives us an opportunity to investigate further deep into the problem. At times it discloses some new areas before the investigator too. For the sake of convenience the investigator will like to present review under the headings like -

2.1.0 Fostering Creativity

2.2.0 Correlates of Creativity

2.3.0 Indian Studies

2.1.0 Fostering Creativity

Creative power is possessed by everybody, and there are numerous evidences for stimulating and training it, and this increases the creative power beyond its latent conditions. In the following paragraphs some of the studies with different methods of treatment are reported.

By Special Programmes :

The earliest landmarks in this tradition is the creative problem solving course, instituted by Crawford (1951). It is known as attribute testing. Crawford explains, 'Each time we take a step, we do it by changing an attribute or a quality

of something, or else by applying the same quality or attribute to some other things'. It is not only a method of developing creativity but an explanatory theory or creative process. After this attempt, many researchers have endeavoured for the enhancement of creative thinking by one way or other.

Parnes (1962) the president of Creative Education Foundation, reported a study in which over 1200, day students and evening students have completed their creative training course. The syllabus for the course was based on the principles and procedures set forth by Osborn. The results showed substantial gains in quantity of ideas on two tests of ideas quantity, repeated at the end of the course.

Covington (1968) described a research programme at Berkeley for developing curriculum programmes aimed at promoting the general level of creative thinking among elementary school children. After pilot tryouts and several full scale experimental studies, the General Problem Solving Programme (GPSP) was constructed with a series of 16 creative tasks in miniature for 5th and 6th grade levels. These problem episodes acted as vehicle, by which the student practised a number of broad rules and strategies concerned with facts of effective problem solving. The author reported

that in general the outcomes of various studies employing the GPSP have been highly consistent. The performance of the instructed children was markedly superior to children of the controlled group; both on the test of problem solving ability and on the test of creative thinking.

A programme, known as 'New Connecticut Mark I Creative Programme' is developed by Callaghan (1973). He studied the effects of his programme on creative thinking of sixth grade children. The results indicated that there was a trend towards high mean scores for experimental group.

Alencar (1974) studied the effects of creativity instructional programme (The Purdue Creative Thinking Programme) on creative thinking abilities of 4th and 5th grade pupils of public and private schools. In the experimental conditions, after the reading of a story about famous American pioneers, by the teacher, the pupils worked on some creativity exercises. A pretest - posttest parallel form design of experiment, revealed that, (i) The Purdue Creative Thinking Programme had positive effects on the development of pupils' creative thinking abilities. The pupils from the experimental classes scored higher than the controlled on figural fluency, flexibility and originality for the task 'unusual uses'. (ii) Reinforcing pupils performance on the creativity exercises did not result in greater gains from the programme than using it without reinforcement. (iii) Differences among classes within

treatments were observed for figural fluency, flexibility and originality for the task 'lines' and verbal flexibility and verbal originality for the task 'unusual uses'. Thus, treatment could not be assumed to be uniformly effective for all participating classes.

The above mentioned studies were related for developing general creative thinking. But there are studies related with the training of some specific components of creative thinking, like originality, elaboration etc.

In a carefully controlled experiment, Maltzman and others (1958-'60) studied the effects of training on originality. They found that training in the production of responses, low in an individual's responses hierarchy, increased originality of verbal associations and that the effect of such training tended to ensure atleast under the given experimental condition. Davis and Marke (1966) also undertook a study to find out the effect of training for originality. The college students served as a sample and they were instructed to imagine themselves within a particular situation. The investigator explored that the experimental group of students proceeded nicely, produced more original and larger number of ideas compared to the students, who did not receive the treatment.

Ridley and Birney (1967) experimented on 159 college freshmen males, for the effect on original behaviour as measured by two tests from Guilford's originality test battery. Major hypotheses based on previous literature were, that all variables would significantly facilitate performance on Plot Titles Test. The results confirmed the hypotheses.

In order to develop the ability of elaboration, Weinstein (1975) conducted an experiment. The experiment subjects participated in a series of five one hour elaboration skill training sessions, administered approximately at an interval of one week. The results of the experiment revealed significant mean differences in favour of experimental group. Eugene (1973) studied the effects of post laboratory discussion in science on selected 'inquiry skills' Judged to be components of creativity. Study was conducted in order to determine the relative effects of two distinct teaching strategies on four inquiry skills, i.e. observation, inference, classification and verification, four aspects of creativity i.e. fluency, flexibility, originality and elaboration with six grade children of urban and suburban schools. The first teaching strategy, designated probing, was divergent in nature and emphasized direct student involvement. The second teaching strategy, designated non-probing, was predominantly convergent in nature and emphasized the role of the teacher in explaining problems

and their solutions. The instructional period lasted for eleven weeks and results indicated that the probing strategy was most effective in developing the skill of inference. The suburban children were significantly more elaborative than the urban ones.

By Brainstorming :

There are some studies in the related literature about the effects of Brainstorming on the creative thinking. In one study, Turner and Rains (1965) tested 30 high and 29 low creative subjects for the effects of Brainstorming, upon idea production. They found positive effects of the Brainstorming/instruction between the two groups. In another study, Fleming (1972) tested upon eleventh and twelfth grade biology students to find out the social facilitation effects upon selected cognitive activities including Brainstorming. The results indicated that there was significant difference between the number of different usable ideas produced and orally recorded on tapes by students Brainstorming.

Hutchinson conducted a fifteen days study with Brainstorming method which treated social studies students as thinkers. The results shown that the modified instructional method of Brainstorming produced distinct change in the ratios of verbal response categories. There was a sharp increase for

the experimental group in total productive thinking, particularly in evaluative thinking.

By Self Instructional Programme :

Certain studies have been reported using self instructional programmed materials for developing creative thinking. A controlled experiment was conducted by Amaran and Giese (1965) in fifth grade classes to investigate the extent to which creativity and problem solving skills of children could be nurtured through a series of self instruction programmed lessons. Improvement in productive thinking skill was found for both boys and girls of both higher and lower I.Q. Greater gains were found in classroom providing little support and encouragement for productive thinking.

An intriguing technique for stimulating originality in the classroom has been developed by Covington and Crutchfield (1965). They devised auto-instructional programmes, composed of defective and mystery story material which they gave to 5th and 6th grade children. The results revealed that the subjects who used the programmes markedly performed better on certain problem solving, creativity and relevant attitude measures, than the controlled subjects. These findings were replicated in a second study also.

Olton (1967) mainly concentrated on the problem of improving the problem solving faculty of 5th grade pupils by giving self-instructional programmed lessons. He took a sample of 704 students. His results which were significant statistically showed that his programme proved to be effective on a wide variety of productive thinking measures;and problem solving performance. He concluded that his programme was benefited equally to all pupils regardless of differences in I.Qs., sex, and classroom environment.

By Questions :

A number of instructional strategies have been developed, that places great importance upon the role of questions asked by both teachers and students. Some evidences seem to confirm the assertion that the teacher's manner of asking questions is 'by far the most influential single teaching act' (Taba et al 1964), because there has been found an almost perfect correlation between the levels of thought pupils displayed in their answers to teachers' questions and type of questions asked by their teachers. (Taba, Levine and Elzey 1964).

RRaof (1973) investigated the possibility of stimulating and developing creative thinking in junior high school students in science classes by employing 'divergent' questions, Attribute listing, Brainstorming etc. It was found that creative

thinking in students can be stimulated and developed by these techniques whereas Chasas (1973) found no significant relationship between teaching methods (lecture, discussion, using broad questions and discussion using narrow questions) and development of critical thinking ability of students. The study by Beseda (1973) also indicate that pupils taught by teachers trained to use more divergent questions did not show significant gain in students achievement or thinking ability. In fact, increase in divergent questions by the teachers produced a decrement in thinking of his pupils; so he suggests to minimise the use of divergent questions to develop thinking.

By Audio-Visual Aids :

Some attempts were also made to study the effect of the use of visual instruments upon creative thinking. Lindgren (1969), Belchar (1973) were some of the pioneers in this respect.

Belchar demonstrated the feasibility of using film-mediated models to engender creative (original) verbal responding in children. The purpose was to examine whether observational learning has a visible training effect with regard to creative behaviour and even more important, whether the potency of the effect exceeds the more commonly employed media of written instruction. Six groups of equal

size were employed with a total sample size of 187 eight gradess. Two groups viewed the experimental film, two were the controls and two read the creativity training programme. One group in each of those pairs received a pre-test while the other did not, to determine if there was a testing effect. The results indicated of the three groups taking the pre and post tests, the two experimental groups (film and reading) showed significant positive effect of fluency from pre and post test.

Khatena (1973) conducted a study to find out the effects of his creative thinking strategies with children between the age of five and eleven to think creatively. Teachers were trained for these patterns of teaching. The 'two groups randomised subjects, post-test only' design was used. The results showed that the children under training to think creatively with pictures had significant influence on their productivity in terms of figural flexibility, originality and evaluation, especially so at the kindergarten and grade one levels for these abilities.

The above discussion reveals that many studies have been conducted in which different methods were employed in order to find out their effect upon various levels of creative thinking and indicates that there are research evidences that

creative thinking can be fostered. But on the contrary to this, there are studies that showed no significant effect of training upon creative thinking.

Stern (1973) reported that the treatment of watching of special television programme like cartoons, sports, comics, dramas etc. were not effective for the development of creative thinking among mentally gifted minors. Instead, the score of control group showed an increase in creative ability when the posttest scores were compared with the pretest scores.

In other study Zelnick (1973) concluded that creative learning experiences were not more effective in improving over all reading and arithmetic skills.

Brandt (1974) conducted an experiment which revealed that there were no significant treatment effects of group counselling and creativity training on creativity, adjustment and achievement of fifth grade children.

2.2.0 Correlates of Creativity

There are many studies, correlated with creative thinking. Some of them will be discussed in the following paragraphs.

Creativity and Achievement :

The findings of Rusch et al (1965), with respect to achievement and creativity, are important for educators. They found in their study that fostering creativity did not have a negative effect on achievement. This results is important as it gives confidence to the investigators that their attempts for developing creativity may not in any way affect the students' achievement.

In a study conducted by Amaran (1968) at the University of Minnesotta, it was found that if the underachievers are given the procedures of problem-definition and problem-solution, the creativity training, motivated them to solve their own problems. For this study, a six weeks training for 63 students of average ability but with merge cultural backgrounds, were given in becoming aware of surroundings and experiences, noting habits and functional fixation, finding ideas, spurring questions, testing and modifying, attributing for stimulating imagination. From this study it was favoured that creativity training should be included in the school curriculum, particularly for the socially handicapped. Carlson (1974) planned, implemented and evaluated her specific programme on a young learning disabled child. Her programme focused mainly on strength in creative thinking abilities

and activating the evaluative effort on the part of the child. She found that out of 10 measures used in the study to assess change in academic achievement, five gave results indicating a change in positive direction. At the University of Chicago Getzels and Jackson have found that among bright students, the most highly creative ones excel in achievement to as great a degree as do the highest I.Q. students. This has been corroborated by Torrance of the University of Minesota.

Teacher Training :

Attempts were also made to give some training for the changing behaviour of teachers in their classroom for the development of creative thinking in students. Wilson (1973) studied the effect of the pre-service creativity training on the creative abilities of prospective teachers and their pupils. He found that the prospective teachers improved in fluency and flexibility, during the training period, and originality and personal worth during student teaching. He also found that pupils improved in fluency, flexibility and originality but declined in elaboration.

Williams (1973) reported a novel method which was known as 'Operational Snow Fall' introduced and sponsored by the U.S. Office of Education. The purpose of this National School

Project was, to try the entire staff of selected elementary schools, throughout the country, on methods, procedures and techniques for developing intellectual creative talent among young children. Teacher-inservice-training was conducted across a basic model of William. Materials and techniques utilizing the teaching strategies were demonstrated to inform teacher how a particular subject area could be used as a means for guiding pupils to think. The entire school programme is being modified and all teachers from kindergarten to sixth grade in each of the project schools are being trained and they work together to innovate and experiment with ideas for developing intellectual creativity. Experiences with this pilot project were positive and Williams' suggested that inservice-training should be continued in the operational phase to improve the teachers' familiarity with those progressive educational strategies.

Besides the training for teachers, training for administrators was also found to be successful. Irving (1973) tried to evaluate the effect of creative training for chairman. In a pretest-posttest control group design, seventy four high school department chairmen took part in the experiment. Eight week workshop programme in creative training and problem solving was designed for the participants. Results from the analysis of covariance yielded significant differences ($P < .01$) on six of the seven sets of scores. All differences were in favour of the experimental group.

Teacher Personality Behaviour :

The position of the teacher in the classroom is vital and this makes the whole environment congenial or uncongenial for the creative thinking of his pupils. Mcnary (1967) conducted an investigation to see the relationship between teacher characteristics and the degree of change shown by gifted elementary pupils in convergent and divergent thinking areas. Convergent and divergent tests were administered over one academic year. A series of multiple regression equations was calculated. It was found that teacher personality traits were most effective for the change producing variable and that different types of teachers influenced different areas of growth. The study of Wodtke and Wallen (1965) also gave strength to this point. They reported that a high degree of controlling behavior by teachers was detrimental to verbal creative performance.

A four year study was conducted by Weber (1968) to test the hypothesis that indirect teacher behaviour foster pupils' creativity more than do direct teacher behaviour. Results suggested that verbal creativity was fostered more under the influence of indirect teacher behaviour and that figural creative potentialities were encouraged more under the influence of consistent patterns of teaching behavior. From this it would seem that consistent indirect teaching behaviour would encourage the growth of both verbal and figural creative

expression and scholastic achievements also.

Wilson (1973) sought to assess the relationship between levels of thinking used by a teacher and pupils to determine if the teacher's level of thinking would be raised significantly with a corresponding raise in the pupils' level, and if the awareness is developed through the use of an interaction analysis feedback system. Results showed the change in the mean levels of thinking, of experimental group teachers and pupils, was significantly higher than those for the control group. Levels of thinking were reflected by the verbalization that took place in the classroom. Similar assumptions were made by Withall (1951), Mitzel and Rabinowitz (1953), Aschner (1962), and Flanders (1963).

In a laboratory study conducted by Penick (1973) the physical facilities and the available science materials were held constant, while teacher behaviour was manipulated to form two distinct patterns. These teaching patterns were referred to as student structured learning in science (S.S.L.S.) and teacher structured learning in science (T.S.L.S.). One way analysis of variance of the students' observational data revealed that the two classes, on the average, behaved differentially. While students in both the classes exhibited comparable amount of lesson-related behaviour. TSLS students showed behaviour of dependency on the teacher.

Rosenthal and others (1974) conducted experiments in a predominantly black inner city school. The results revealed that greater gains in creativity scores were acquired by children whose teachers behaved in more motivated, child centered, professional and encouraging manner.

The above discussion shows that the creative thinking of the students, to a great extent depends upon the teachers' personality and behaviour. But the findings of Humes (1975) showed a negative point of view. He investigated the relationship of selected teacher characteristics to the development of specific component of young child's divergent thought. Results of the study showed significant gains in only one of the measured components of divergent thought.

Environment and Creativity :

Researchers have reported that among the home and institutional environment, factors affecting creative abilities, the role of family background, school climate and classroom climate are very important.

Environment is a major factor that enhances or retards the development of creative thinking. A good number of studies agrees with this statement, whereas certain others do not. Torrance (1965) conducted a number of studies about classroom climate for creativity development. From these

studies he found that engaging in a larger variety of creative activities may result in greater word fluency. He also found that differential rewards influence originality of thinking. He again observed that pupils permitted to practise without teacher evaluation were able to perform more creatively on subsequent occasions that the pupils who had practised with evaluation.

Branch (1974) also found in her study of 15 classes of fifth grade and 15 classes of first grade in a large urban school system in Georgia, that classrooms having nurturing conditions for creativity had positive statistical relationship with creativity test scores.

To test the development of creativity, which has been frequently claimed as one of the advantages of open education, Ruedi (1974) compared the fourth, fifth and sixth grade children of traditional and open environmental schools. He found scanty support to the belief that open environment would tend to foster more creativity. Only one F ratio of the factors involved was significant at 0.05 level to be higher for the subjects of open sixth grade.

Ogletree and Wilma (1973) found from a study of 1165 primary school children of England that creativity scores were a function of S.E.S. background. They also said that in

all countries children of upper class families obtained significantly higher creativity scores (verbal and non-verbal) than children of middle and lower class families. The same significant difference was evident in middle class children and lower-class children. There was no evidence to support the contention that youngsters of lower-class background performed better on non-verbal tasks than on verbal tasks. While Stein (1955) reported that parents of high creative subjects had not gone as far educationally as parents of his low creative subjects. Furthermore he reported that the S.E.S. of the parents of his high subjects was not so high as that of low creative subjects.

2.3.0 Indian Studies

Recently, in India attempts have also been made to develop measures of creativity and to study its correlates.

Measures of Creativity :

Bager Mehdi (1970) devised a battery of tests to identify creative talent at the primary and middle school stages. His battery consisted of verbal as well as nonverbal tests of creative thinking.

In 1972 Passi developed a battery of creativity test for higher secondary school children. The battery consists of

verbal and non-verbal tests.

Kaul (1974) developed a verbal test of creativity in Hindi for children of fourteen to sixteen years age group. While Ramachandrachar (1975) developed a test to identify creative children at the school leaving age.

Correlates of Creativity :

Some studies have investigated the correlates of creativity. Khire's (1971) findings showed that creativity has lower correlation with mechanical comprehension and intelligence, but higher with scholastic performance.

Sharma (1971) studied the effects of intelligence, selected interest and socio-cultural variables on creativity. The findings suggest that creative thinking showed progressive trends with intelligence upto 120 I.Q. points while literary and agricultural interest did not show any effect on creativity. He also found that rural boys were more creative than urban ones.

Verma (1973) from his study of higher secondary school adolescents, regarding divergent thinking in relation to certain personality dimensions, found that autonomy, nonconformity and openness of mind were functionally related to the abilities of divergent thinking and they could be developed along with the divergent thinking abilities, by appropriate plans of school education.

Goyal (1973) reported that the more 'open system of education and the more 'responses' and stimulating environment in school, the more would be the evidence of the development of creativity.

Gurbaksh Lal (1974) studied the effect of creative thinking and vocational anxiety on the success in teaching of 300 teacher trainees from Punjab. He found that interaction effect of vocational anxiety and creative thinking on teaching success was significant, whereas interaction effect of general anxiety and creative thinking was not significant.

Joshi (1974) in his study of the intellectually gifted students, found that giftedness was an effective contributor to all types of creativity scores.

Gakhar (1975) observed that high and low groups of girls on verbal creativity differed significantly with respect to status, intellectual efficiency and flexibility. He also investigated that personality traits of self-acceptance and self-sufficiency were distinguishing characteristics of high group on nonverbal creativity.

Jha (1975) discovered four factors of creative persons. The main factors reflected rational optimism, high ego strength, realistic and healthy attitude towards life, openness to experience, assertive self-confidence and tendency for self-actualisation.

Rao (1976) studied some cognitive correlates of creativity. He found that boys with broad - category - width, field - independence and higher levels of interrogative complexity, did better in their performance on creativity tests by displaying more fluency, flexibility and originality.

Srivastava (1977) observed that (i) there was no significant correlation neuroticism, extraversion, fluency, flexibility, originality and total creativity (ii) Science students, urban students and students belonging to high income group, were significantly high on creativity test; children of highly educated parents also scored significantly higher on creativity scores.

The study of Singh (1977) revealed that high creativity among student-teachers tempted to go with higher economic value, better personality adjustment, better family background and urban living. Teacher attitude, sex, marital status, religion and caste did not seem to have significant differential effects upon creativity among student-teachers.

Gupta (1977) studied relationship of creativity with self concept among school going children. He found that highly creative individuals possess higher self concepts and self-acceptance; and creativity and self concept were closely related dimensions.

In a study of some methods of training in creativity, Nirpharake (1977) constructed hypotheses that (i) all the experimental groups, receiving training in at least one area, would make significant improvement (ii) the performance of the experimental groups on the creativity test after training would be better (iii) the experimental group receiving training in all the areas (four) would make the highest improvement. For testing hypotheses he took the sample of thirty six boys in grade VII, coming from middle class families with urban background. For the training he used lectures followed by discussion; demonstration, problem solving, role-playing etc. All the above mentioned hypotheses were accepted. This indicates that even short period of training in creativity gives fruitful results.

Pillay (1978) studied the effects of patterns of teaching upon creative thinking of 71 eight graders. He observed that the treatment of Creative Teaching Method, when compared with the traditional method, did not produce differential effect upon general creative thinking and on its sub-parts such as seeing problems, unusual uses and consequences, and upon creative thinking in geography too.

2.4.0 Summary

From the above discussion it can be seen that a number of researchers has been attempted to see the effects of different

techniques of fostering creative thinking. To summarise briefly, it is found that various types of training sessions were conducted by Crawford, creative Education foundation, Covington Callaghan, Alenoar, Maltzman, Ridley and Birney, Weinstein, Eugene etc. in which school students participated as subjects. The results indicated in general, higher mean scores for the experimental groups on creative thinking and its components, such as originality, elaboration, flexibility, fluency etc. Brainstorming, as a effective method for enhancing creativity in their experimental subjects, was successfully used by Turner and Rains, Fleming, Hutchinson etc. While Amaram and Giese, Crutchfield, Olten etc. used self instruction programmed material in their studies. The results found were favourable for their experimental groups, in problem solving and productive thinking abilities. Raof, Beseda, Chasas etc. studied the effects of different types of questions on creative and critical thinking. Visual instruments were used by Belchar, Lindgren, Khetana, Stern etc. for developing creative thinking in their experimental subjects. Some of the components like fluency, flexibility, originality, evaluation, of creativity were to be developed by the treatments through the visual aids.

Amaram, Carlson, Rusch et al. found that fostering creative thinking, did not have a negative effect on achievement.

Certain attempts have also been made to give creative training to teachers and administrators in order to find the effects upon their students' creative thinking. Wilson, Williams, Irving etc. who tried with this approach concluded that such training courses were needed for the teachers.

Environmental studies are also found in related literature with regard to socio-economic status, teachers' personality, teachers' behaviour, openmindedness, attitude, rewards to students, classroom climate etc. Wilson, Withall, Flander, Mcnary, Weber etc. concluded that the creative thinking of students, to a great extent depends upon the teachers' personality and behaviour. Torrance, Brandt, Ruedi, Ogletree etc. agree that environment is a major factor that enhance or curtail the development of creative thinking.

During the last decade, Indian researchers have taken interest in the field of creativity. Baquer Mehdi, Passi, Kaul, Ramachandrachar etc. developed a battery of creativity tests. Khire, Sharma, Varma, Joshi, Gurubaksh Lal, Gakhar, Shrivastav, Gupta etc. have studied the effects of different correlates of creativity. Their findings showed that intelligence, anxiety, interest, neurotism etc. have poor correlation with creative thinking, while some personality traits, giftedness, self-concepts, etc. have good correlation with creativity. Goyal and Singh

considered that schoolc climate and socio-economic status have positive effects on the creative thinking. Only two studies, regarding the effects of treatment on creativity are found in Indian literature upto 1978. Nirpharake found positive effects of his treatments for enhancing creative thinking, while Pillay, like Brandt, Stern etc. found that his treatments were not effective for the development of creative thinking.

From above, it is seen, barring a handful of studies, that there are sufficient evidences for the hunch that creative thinking can be fostered. These results give confidence to the investigator that his attempt for the development of creative thinking through different methods of teaching, may not, any way, be a mere wastage of time and energy, when Indian education has generally neglected the exploration and enhancement of creativity among students.
