"Because creativity is a world which has recently been taken over by Science from religion, it is almost impossible to discover it in a dictionary or encyclopedia more than a decade old. It is a new concept, recently attributed to the personality of man and still fraught with some mystical connotations. 

- Demos, Gowan and Torrance (1967)
CHAPTER III
REVIEW OF PAST RESEARCHES

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3.0 Introduction

A review of the related literature is an initial step for any research work. As pointed out by William Viersma\textsuperscript{1}: "Educational research is not or at least should not be, carried out in an information vacuum".

Therefore a researcher should be familiar with the area of the research work to be done. He should be familiar with the literature, comprised of reports, journals, articles and books. The review done by the investigator would provide historical background of "Creativity", and it would be possible for the investigator to foresee the limitations and scope of the study. The review would help the investigator in selecting proper tools, and treatment of data. Moreover, it would help to precise the conclusions of the investigator and to avoid ambiguities.

The present study has two major objectives. Its first objective is to develop a test to measure the creative thinking ability of the students studying in Std. II to V. The second one is to study the creative thinking ability of a primary school children in context of certain
variables. Thus keeping in view the nature of the present work, the review of the related literature has been undertaken in two parts:

(i) Review of the work done in creative measurement.
(ii) Review of the work done in the field of creativity.

3.1 Outline of Review Work

For the purpose of clear understanding a researcher must go through the past work step-by-step. Henceforth, this part is divided into two sub-parts.

3.1.1 Creative Test Construction Abroad and in India
3.1.2 Research work in creativity

The correlational study of researches in creativity is made keeping in view its various correlates as shown below:

(a) Creativity and Personality

It is related to personality of a creative child, creativity and personality growth and trends of creativity, components, personal variables and second order personality correlates of creativity. Creativity as related to the values of the Indian adolescent students.
(b) **Creativity and Intelligence**

Different researches like creativity as related to intelligence, a study of creative thinking with special reference to intelligence, creativity and its components as affected by intelligence and relationship of intelligence and fluency among students are included in this field.

(c) **Creativity and Education**

It gives the review of different researches like, education, teachers' creativity and family background, a study of relationship of creativity and academic achievement among secondary school children, creativity as related to achievement, motivation and birth order.

(d) **Researches on Creativity Training**

This is a branch of research field in creativity which is most important and yet a few researches have been completed. Some well-known researches are listed here e.g. special programmes for developing creativity, techniques for development of creativity, creative problem solving and divergent thinking, transcendental meditation etc.

(e) **Creativity and its Measurements**

This includes the trends and status of testing in
Norms

Adolescents and Adults from kindergarten through graduate school.

Time duration: 10 minutes per item/2 hours

Sample: 217 pupils


Part I: The Non-Verbal Test of Creative Thinking Consists of three sub-tests namely

(a) Incomplete Figure Task

First the test administrator gives examples for the first incomplete figure, children can add some lines and sketch some objects or designs and make up title for each picture. It provides the subject with an unlimited opportunity to make responses and also encourage free play of imagination and originality.

(b) Picture Construction Task

In this test of creativity is intended to measure the individual’s ability to deal with figural content in a creative manner. Unlimited opportunity is given to think about the picture construction. It provides opportunity
creativity, problems in measurement of creative thinking and their users.

From these classifications some researches related to the problem will be discussed in next caption.

3.2 Review of Test Construction

Good amount of work in this field of creative test construction has been done in foreign countries, especially in U.S.A. Some research work pertaining to creative test construction has been done in India too. Here the investigator has reviewed the various kind of creative test construction in two phases:

(a) Creativity Test: Abroad
(b) Creativity Test: India

(a) Creativity Test - Abroad

Study 1: The Minnesota\textsuperscript{2} Tests of Creative Thinking by E. Paul Torrance

Nature of Test

Individual and Group test
Non-verbal tasks
Verbal tasks using non-verbal stimuli
Verbal tasks using verbal stimuli
to use his imagination with different type of figural tasks and come out with some novel idea. Originality and elaboration can be measured by this activity.

(c) Circles and Squares Tasks

In this part circles and squares are printed on a sheet of paper. The following instruction is given, "Prepare as many pictures as you can and label each of them". He is provided unlimited opportunity to prepare various pictures of a different category. Here fluency, flexibility and originality can be measured.

Part II : Verbal tasks using non-verbal stimuli of creative thinking consists three sub-tests namely

(a) The Ask and Guess Test

In this test printed picture is given to the child. The child sees the picture, reasoning and thinking process is going on his mind. Curiosity of the child can be watched here. Unlimited number of questions are suggested by the child. The questions are of two types:

(i) Answer of the question given after watching the picture
(ii) The questions which cannot be replied by looking at the picture.

(b) **Product Improvement Tasks**

In this test fluency, flexibility and originality can be measured. Interesting materials (toys, dress and any other tools) are given. The child can use this material and prepare various type of articles. Afterwards the tester can examine keeping in view the newness, reality, productivity and magic power.

**Part III : Verbal Test Using Verbal Stimuli of Creative Thinking Consists ten Sub-tests namely**

(a) **Unusual Uses**

It measures the subject's ability to creative items of information from his personal information in storage. It also measures the subject's ability to shift frames of reference to use the environment in an original manner.

(b) **Impossibilities Task**

Imagination power can be judged. Originality, fluency and flexibility can be measured.
(c) **Consequences**

This test measures the dimensions of fluency and originality.

(d) **Just Suppose**

In this test imagination can be measured. Flexibility and fluency also can be measured.

(e) **Situations**

Subjects are told that they would be given three common problems and that they would be asked to think of as many solutions to these problems as possible.

(f) **Common Problems**

Subjects are interested that they would be given two common situations and that they would be asked to think of as many problems as they can that might arise in connection with these situations.

(g) **Mother Hubbard Problem**

The administration of this task has stimulated a number of ideas concerning factors which inhibit the development of ideas.
(h) **Cow Jumping Problem**

The task is to think of the possible things which might have happened when the cow jumped over the moon.

(i) **Imagination Stories**

Titles are given from which imagination stories should be written.

**Study 2: Kogan-Wallach Test of Creativity**

Kogan and Wallach developed a test of creativity that includes two parts: (1) Verbal (2) Figural.

**Part I: Verbal Creativity**

It includes three verbal techniques.

(A) **Instances**

Here a child is asked to generate possible instances of a class concept, the four items are included in this technique such as under:

(i) Name all the round things you can think of.
(ii) Name all the square things you can think of.
(iii) Name all the things you can think of that will make a noise and so on.
(B) **Alternate Uses**

Here a child is to generate possible uses for a verbally specified object. The eight items included in this technique are as like:

(i) Tell me all the different ways you can use a newspaper.

(ii) Tell me all the different ways you could use a knife.

(iii) Tell me all the different ways you could use a chair ... etc.

(C) **Similarities**

Here a child is to generate possible similarities between two verbally specified object. This technique is comprised of ten items like:

(i) Tell me all the ways in which a potato and a carrot are alike.

(ii) Tell me all the ways in which a cat and a mouse are alike.

(iii) Tell me all the ways in which a train and a tractor are alike ... etc.
Part II: Figural Creativity

There are two types of creativity assessment technique involving visual rather than verbal stimulus material.

(A) Line Meaning

Here the child is provided with one or another kind of a line and he is asked to generate meanings or interpretations relevant to the form of the line in question. The variables of similar responses and number of responses are scored for each item and are summed acrossed for the total creative score. The reliability of score has been established by two ways:

(i) Split-half reliability of each measure that changes from 0.51 to 0.93.

(ii) Items of some correlations for each of 10 measures with the total creativity score were computed.

(B) Pattern Meaning

Here the child is to generate possible meanings and all interpretations for each of the visual design. It consists of eight items.
Line Meaning

Fig. 6

Fig. 7

Fig. 8
Pattern Meaning

Fig. 9

Fig. 10

Fig. 11
(b) **Creativity Test : India**

**Study 3 : The Creativity Test of N.S. Chauhan and Govind Tiwari**

Nature of Test : Verbal, Individual and Group both.
Age group : Adolescents and Adults
Time duration : Three hours
Availability Source : Agra Psychological Cell, Agra.

This creativity test is a multi-dimensional set of five questionnaire scales. This test provides scores for five of the eight components of creativity. This test is in line with Guilford but its two components differ from the Guilford test of factors. This test is started after formation of good rapport. This purpose is explained and active co-operation is sought. The subjects read the test themselves and answer by writing on the answer booklet provided to them. The scores are obtained both on quantitative and qualitative dimensions. The manual remains the guide scores for the five components that are obtained separately. The single score of creativity is obtained from the Z-score table. This test also provides scores for various sub-components of fluency and flexibility. The T-score table is useful for this purpose.
Study 4: Creativity Test by Baquer Mehdi

Nature of Test: Verbal, non-verbal both, individual.
Norms: VII and VIII class pupils.
Administration: Urban and Rural
Sample: 300 Urban pupils, 175 Rural pupils.

The Verbal Test of Creativity consists of four sub-tests namely:

(a) Consequences Test

It consists of four hypothetical situations and requires the subject to think as many consequences as he can. It provides the subject with an unlimited opportunity to make responses and also encourages free play of imagination and originality.

(b) Unusual Uses Test

It measures the subject's ability to retrieve items of information for his personal information in storage. It also measures the subject's ability to shift frames of reference to use the environment in an original manner.
(c) **New Relationship Test**

This test requires the subject to think as many novel relationships as possible of the given subjects. It also provides an opportunity for the free play of imagination and originality.

(d) **Product Improvement Test**

In this, the subject is asked to think of simple wooden toy or a horse and to suggest addition of new things to make it interesting for the children to play.

**The Non-Verbal Test of Creativity**

The Mehdi's Non-verbal test of creativity is intended to measure the individual's ability to deal with figural content in a creative manner. Three types of activities were used for this purpose - picture construction, picture completion and triangles and ellipse. The three activities taken together provide ample opportunity to the subject to use his imagination with different types of figural tasks and come out with some novel idea.

**Study 5 : The Creativity Test by B.K. Passi**

Nature of test : Verbal, Non-verbal, individual and group (both Hindi and English)
Passi's test of creativity, both in English and Hindi are developed for the purpose of measuring creativity in school children. Altogether six tests are included in this test battery such as:

(a) **The Seeing Problem Test**

It is a verbal individual group administered test. It is designed to measure the factor of sensitivity to problems, the ability to comprehend problems concerning the working of simple and handy articles of common use.

(b) **The Unusual Uses Test**

This test includes the names of things which could be used for numerous purposes but only those items which have proximity with the psychological and physical environment of the subjects.

(c) **The Consequences Test**

This measures the dimensions of fluency and originality. The pattern of the test is based on the tests of Guilford and Torrance.
(d) **The Test of Inquisitiveness**

This test expects the subject to imagine and write as many questions as possible within six minutes. The question should be mutually exclusive to one another in content and meaning. The test provides non-verbal stimuli but the responses are to be accepted in writing in any of the language - English, Hindi or Mother Tongue.

(e) **The Square Puzzle Test**

This test aims at measuring persistency with the help of a performance test in which a difficult situation is set up for the subjects with the help of a puzzle - "The Square Puzzle" which consists of five identical right-angled triangles and five identical quadrilaterals made up of plastics.

(f) **The Block Test**

The block test of creativity is a performance test which chiefly follows the pattern of Lownfeld Mosic Test (1952) which was described by Ames and Frances (1962) as useful tool for providing greater opportunity to observe individuals engaged in performing dynamic designs.

Parmesh C.R. (1970) used the Kogan-Wallach test of creativity in his research study at Madras University.
Recently (1981), the Hindi adoption of Kogan and Wallach's Creativity Test was introduced by M.G. Husain. This test is based on three tasks with a few items in each. It is usable to the age group of their of 7+. It is scored for number, uniqueness and total creativity both for each task as well as total tests. It is widely used by project students and persons interested in the area of creativity.

The detail of this test was not available from the persons concerned nor the survey report. Hence the investigator has taken a note of their work in this review chapter.

3.3 Review of Researches in Creativity

Study 6: Divergent Thinking Programme in Maths

Gira C. Vora submitted a Ph.D. thesis to Sardar Patel University, Vallabh Vidyanagar, 1984. The review of her research study is briefed below:

Problem

An Investigation into the Impact of Divergent Thinking Programme in Mathematics on the Creative Levels on the Children of Classes VII and VIII.

Sample

271 students. One school complex with co-education system in Gujarati medium was chosen for the experiment.
Three classes of standard VII and VIII from the school in Ahmedabad was selected. Tester has tested the students in three different ways (i) Creativity training programme with feedback. (ii) Creativity training programme without feedback and (iii) Whether no training has any effect on the creativity of the pupils.

**Tools**

Main tools used in this experiment were (1) PTC and (ii) DTPM.

(i) **PTC** - A standard test battery in creativity by Dr. B.K. Passi was selected.

(ii) **DTPM** - The tool was prepared and tested as an instrument for creativity.

**Hypothesis**

(i) Creativity is increased by the DTPM with and without feedback. (ii) Creativity components viz., fluency, flexibility and originality are increased by the DTPM with and without feedback.

**Results**

(1) The experimental groups at both the grade levels were significantly superior to control group students. The
F-values for adjusted means obtained were 9.94 for the Std. VIII and 7.4 for the Std. VII respectively which were more than 3.23 i.e. $F$ (table) at 0.05 level. The results go to prove that DTPM is a useful tool to increase the creativity of the students of both the standards. Then as per T-test, the difference between the two experimental groups was computed and found below the level of significance (7.34 (obs) 11.5 (table) for VIII Std. and 12.30 (obs) 14.5 (table) for VII Std.) at 0.05 level. This result shows that the training is not significantly effective for these students as the difference between two experimental groups is low.

(2) The experimental groups were found to be superior to control groups for both the sexes. The F's of adjusted mean values were found to be higher than the level of significance at 0.05 for boys and girls, $F$ (table) bring 3.23.

The above result shows that DTPM is useful to increase creativity of a boy or a girl of this age group.

**Conclusion**

On the whole, the results derived from this analysis are very interesting and encouraging, showing that creativity can be developed through DTPM.
Study 7: Creativity as a Function of Interest, Intelligence and Culture

K.N. Sharma submitted a Ph.D. thesis to Agra University, 1971. The review of his research study is briefed below:

Objectives

The main objectives of the study were:
(i) to study the effects of intelligence upon creativity,
(ii) to study the effect of interests upon creativity,
(iii) to study the effects of culture upon creativity,
(iv) to study the interacting effects of intelligence and interests upon creativity,
(v) to study the interacting effects of intelligence and culture upon creativity,
(vi) to study the interacting effects of interests and culture upon creativity,
(vii) to study creativity as affected by the interaction of intelligence, interest and culture simultaneously.

The present study being an ex-post facto one, employed a factorial design of 2x2x2 type. The two variables namely, intelligence and the interests were taken at two levels - high and low, while the socio-cultural variable had its two levels as the urban and the rural. Two tests, namely the Sarjanatmaka Pariksha and the Varn Viparyas Pariksha were developed to measure creative thinking. A sample consisting of 414 class X male students in the age range of fourteen to
sixteen years, studying in high schools and intermediate colleges of the Agra District was selected using stratified random sampling technique. The two tests as mentioned above, along with Jalota's Samoohika Mansika, Yogyata Pariksha and the Chatterji's Non-language Preference Record from 962 were administered to the sample. The data were analysed using extreme group analysis and inter level analysis.

Findings

1. High intelligent subjects were significantly higher in creative thinking than the subjects of low intelligence.

2. In both the urban and rural samples, the creative thinking showed significant progressive trends with intelligence up to the I.Q. of 120 or so and thereafter no progressive trend was observed clearly.

3. Literary and agricultural interests did not affect creativity at all.

4. Fine arts interest affected creativity to some extent.

5. Scientific, medical, technical, crafts, outdoor sports and household interests showed inconsistent effect over creativity and
6. The rural sample was found to be more creative than the urban.

**Study 8: Creativity Evolving Test**

K. Ramachandrachar submitted a Ph.D. thesis to M.S. University, Baroda, 1975. The review of his research study is briefed below:

**Objective**

The objectives of the study were:

1. to evolve a test which differentiated creativity and non-creative children,

2. to study analytically the nature of factors contributing to the phenomenon of creativity described by test.

**Sample**

The sample consisted of 426 standard IX children of six secondary schools of Gujarat and Mysore State. A final sample of 370 students was selected for item analysis.

**Study**

The test was constructed to identify creative children by means of testing the following factors:
(i) Fluency, (ii) Flexibility, (iii) Originality, (iv) elaboration. A pilot study was conducted with a view to constructing the final test. The items for the final test were selected from the items of the pilot study after proper screening. Split-half reliability based on separately timed parts of the test corrected to full length by Spearman-Brown formula was found to be 0.86. The reliability by using K.R. Formula was found to be 0.71. Validity coefficients were found to be between 0.18 and 0.44 on different criteria.

Findings

1. Creative individuals were relatively more fluent and gave a wide variety of responses.

2. Creative individuals preferred indirect literary expressions to direct ordinary expression.

3. The non-creative showed less or no elaboration and

4. Creative children in general indicated the above average performance on the two symbolic abilities.

Study 9: An Analysis of Certain Dimensions of Creativity

Jha S.K. submitted a Ph.D. thesis to M.S. University Baroda, 1975. The review of his research study is briefed below:
Purpose

The main purpose of the study was to explore and analyze certain personality dimensions and to obtain some personality profiles of creative persons.

In order to draw a sample of highly creative persons the nomination method was adopted. For this purpose information was collected from the list of winners of National Awards, the Times of India, Directory and Year Books, "Who is who", "the Filmfare", list of recipients of Bharat Ratna, and Padmashri, National awardees. This resulted into a preliminary list of 166 persons either from Gujarat or Maharashtra. This list was sent to judges drawn from university professors and renowned professionals. The judges suggested eighty eight more names of highly creative persons. The judges also ranked these 254 persons for their creativeness.

Sample

The final selected sample consisted of sixty six creative persons. Out of sixty six data of only thirty five persons could be collected. Data on a questionnaire having eighty statements were collected. The data were further supported by a self data card filled by the respondents. The data were subjected to factor analysis by employing centroid method.
Findings

The main findings of the study were related to the following four factors:

(1) The first factor emerged with the description of the creative persons as having rational optimism, high ego strength, realistic and healthy attitude towards life, openness to experience, assertive self confidence, and tendency for self-actualisation.

(2) The second centroid was a bipolar factor having high positive loadings with religious dedication, religious mystical, fatalistic, and faith in supernatural powers, whereas it had negative loadings with practical, non-religious, outspoken and self confident.

(3) The third centroid was also a bipolar factor having high positive loadings with mystical intuitive guidance from inner self, whereas it had negative loadings with non-mystical, industrious, exerting, and extrovert behaviours; and

(4) The fourth bipolar centroid was positively loaded with self expression, openness to experience, flexible value orientation and negatively loaded with fixed value orientation, methodical, social, extrovert and sensational type of behaviours.
Study 10: An Analytical Study of Creative Ability

M.N. Deshmukh submitted a Ph.D. thesis to M.S. University, Baroda, 1978. The review of her research study is briefed below:

Aim

It aims to indicate desirable changes which must be brought about in the day-to-day teaching to create conductive climate in the class room.

It has been undertaken with the following specific objectives in view:

1. To find out the extent to which the theoretically postulated creative teaching practices are being used in the present class rooms.

2. To find out the potential of the theoretically postulated creative teaching in Indian class room, in terms of gains in creative ability.

3. To study the comparative effect of the original teaching practices viz., Theoretical, Role-playing and Brain storming on the development of creative ability and scholastic achievement.

4. To study the differential gain in creative ability of the pupils having varying levels of intelligence and initial creative ability.
5. To study the influence of sex differences on creative ability of the pupils.

6. To study the relationship between intelligence and creative ability.

7. To suggest measures for incorporating application of the findings of this study in the educational system to make it more meaningful, lively and effective.

**Instrumentations**

To collect the data on these variables, the following tools were used:


2. Group Test of Intelligence by Khanapurkar, 1975.

3. Socio-economic status scale by Kuppuswamy.

4. Torrance Test of Creativity Thinking 1966a.

5. Minnesota Creative Activity Check list by Torrance, 1962a.


7. Students' Reaction Schedule by investigator.
Sample

For the experiment one school was selected from those 20 schools. It was Vidarbha Buniyadi High School, Om Nagar, Nagpur. This school is open for all and is moderate in size. It was, therefore, considered as a representative one and was selected for the experiment.

After pre-testing the experiment started in the second week of January and continued for six weeks. 33 lessons including 3 practice lessons, were taken, 5 lessons a week for each of the experimental groups.

The data of the classroom creativity were collected by the tool (1) and analysed in terms of relative frequencies of occurrence or non-occurrence of the behaviours and percentages. To compare the 3 treatments in terms of their effectiveness in developing creativity and improving scholastic achievement of the students, the three groups had to be matched statistically for the comparisons. Therefore Multi Factors Analysis of Covariance having control and experimental groups was employed to test the hypothesis related to comparison between groups on post-test scores for various creativity and scholastic achievement variables. The students were again divided into three groups according to different levels of intelligence and initial creative ability. To find out whether these groups differ significantly, on the variable
of gains in creative ability, analysis of variance technique was employed.

**Conclusions**

When the two approaches, i.e. role playing and brain storming were compared, brain storming was found more effective than role playing in establishing better teacher-pupil report, in explicit encouragement to unusual responses and creative thinking, and more interesting to students.

The ANCOVA result indicated significantly higher to scholastic achievement in Marathi language for the students taught through brain storming and role playing than the traditionally taught students, when the initial differences in achievements were adjusted.

The results of the present study indicated significant sex differences in creativity amongst VIII graders. In general, girls were found more creative than boys. It is therefore concluded that creativity and intelligence are moderately related at the lower level of I.Q. and that there are sex differences in this relationship, i.e. girls high on intelligence tend to be more creative than boys. It also can be inferred that the children high on verbal ability would tend to be more creative than those who possesses it.
Study 11: Correlates of Creativity in India

Raina M.K. submitted a Ph.D. thesis to Rajasthan University, 1968. The review of his research study is briefed below:

Aim

The aim of the study was to compare quantitatively significant differences between high creative and low creative groups of students on certain measures of cognitive abilities.

Hypothesis

High and low creative groups would differ from each other with regard to certain cognitive abilities, personality characteristics, socio-economic status and sex.

Tools Used

1. The Minnesota Tests of Creative Thinking.
2. Kuppuswamy's Socio-economic status Scale were used for data collection.
4. Edwards Personal Preference Schedule, and the Taylor's Manifest Anxiety Scale were used.

Sample

500 students of Std. VIII, IX, X of Rajasthan Zone.
Findings

1. The higher creative sub-groups scored significantly higher than the low creative sub-groups.

2. A comparison of the high creative males with the low creative males elicited significant differences between groups.

3. The high creative students scored significantly higher than the low creative with respect to academic achievement.

4. The high creative males showed greater achievement autonomy, dominance, endurance and aggression than the low creative males.

5. The low creative males exhibited greater difference and heterosexuality.

Study 12: A Correlational Study of Intelligence and Various Components of Creativity

A Correlational Study of Intelligence and Various components of creativity by Prof. Brundaban Chandra Mishra, Lecturer in Education, G.M. College, Sambalpur.
Debatable Issue

Many attempts have been made to study the nature, extent and trends of relationship between these two mental abilities with different perspectives, but due to the contradictory results so far no single perfect theory has been formulated regarding this relationship. Therefore, it still remains a current debatable issue among psychologists and research scholars whether creativity and intelligence are different modes of thinking or they are related traits.

Hypotheses

1. There is relationship between various measures of creativity. (Fluency, Flexibility, Originality and Elaboration).

2. There are differences in the relationship of intelligence with verbal and non-verbal creativity.

3. There are differences in the relationship between intelligence and various components of creativity for high creative, average creative and low creative groups.

Method and Process

Sample

The sample for study consisted of 125 high school students (boys and girls) studying in standard X who were
drawn randomly from four high schools in the district of Balasore (Orissa). The students selected were belonging to the age group of 15 years and the mean income is Rs. 500/- per month approximately.

Tools

Data on both verbal and non-verbal creativity were collected by using the Torrance Tests of Creative Thinking (Verbal and Non-verbal). Scoring of the tests was done according to the procedure described in the manual. The obtained raw scores of various components of verbal and non-verbal creativity were converted into standards, with mean as 50 and S.D. as 10. Sum of the standard scores constituted the composite creativity score of the subject. The Raven's (1960) standard Progressive Matrices Test was used to measure the intelligence of the students. It presents 60 problems requiring an individual to apprehend meaningless figures provided for observation to see the relationship between them. Conceive the nature of the figures completing each system of relations presented and, by so doing, develop a systematic method of reasoning.

Result

The findings of the study show that creativity and intelligence are significantly related but only up to a certain extent. Beyond that they are independent of each other.
Conclusion

1. Three out of four components of creativity (fluency, flexibility and originality) are found related with intelligence for total sample.

2. The value of correlation decreases when the total sample is divided into three levels of creativity.

3. Verbal creativity has higher values of relationship with intelligence than the non-verbal creativity.

4. Most of the components of creativity are significantly related to intelligence among average creative group.

Study 13: Development of Creative Thinking Ability

Development of Creative Thinking Abilities from Grade III through VII by Dr. Sudeh Gakhar, Department of Education, Punjab University, Chandigarh.¹¹

Aim

This study is an attempt to examine the pattern of creative development from third to seventh grade so as to see if any decline similar to that of Torrance (1962) is noticeable at the age of nine years. Sex differences in respect of growth pattern have also been examined.
Developmental Pattern of Creative Thinking

The development curves for the abilities considered to be involved in the creative thinking follow a pattern which is not identical with most other aspects of human growth. During the elementary school years, fluctuating patterns in creative thinking abilities were observed by Mearns (1941) who maintained that creative activity enjoys free expression till the first three grades with some enjoying in fourth and fifth grades followed by a rapid decline in the sixth and seventh grades. Similar decline during elementary school years was also noticed by Lally and Labrant (1951) and Wilt (1969), while Barken (1960) observed greater spurts of growth at some points than others in creative growth curve.

Minnesota studies of Yamamoto et al (1959) reported that the general pattern of developmental curves of creative thinking abilities demonstrated a study increase from grade one through grade three, and a sharp decrease between third and fourth grade. Another drop was noticed at sixth and seventh grades after which there was a steady growth until near the end of the high school year. Torrance (1962), too observed clear periods of decline, thirteen and seventeen. He is yet another extensive cross-cultural study (1967), came across with marked differences in
performance on creativity tests of children from first through sixth grade, further differential levels of functioning on the figural and verbal measures of fluency, flexibility, originality, and elaboration was depicted. Bedner and Parker (1965), however, pointed out that exceptionally intelligent young adults do not show any significant change in creativity test scores within first three years of college. Gakhar (1975) identified developmental trends in creativity from ninth to eleventh grade and revealed that there is increase in the mean scores from ninth to tenth grade on all measures (fluency, flexibility and originality) of verbal and non-verbal creativity followed by a decline on verbal measures of creativity and a few measures of non-verbal creativity from tenth to eleventh grade. The present study is an attempt to examine the pattern of creative development from third through seventh grade so as to see if any decline is noticeable at the age of nine years as was noticed by Torrance. Sex differences in respect of growth pattern have also been examined.

Design

A cross sectional design has been used by involving age groups 7+ to 11+ representing grade three through seventh.
Sample

A mixed sample of 75 boys and 75 girls was drawn by selecting thirty children (15 boys and 15 girls) from various sections of grade three, four, five, six and seven, out of two Government Schools of Jullundar city. The mean ages of the five groups of children from grade three through seven are 7.4, 8.4, 9.4, 10.3 and 11.4 years respectively. Age has been taken as completed at the first section of testing.

Tests

Torrance Tests of Creative Thinking was administered to a group of 15 subjects at a time in their respective class rooms. Responses were scored in respect of Fluency (F), Flexibility (X), Originality (O) and Elaboration (E) by a trained scorer.

Results and Discussion

Results indicate that while Fluency, Flexibility and total creativity tend to develop progressively from age 7+ to 11+ (grade third through grade seventh) the general tendency of the two abilities, that is, originality and elaboration is to show a decline at 9+ age in their otherwise progressive growth from 7th through 11th years.
Results pertaining to sub-samples of boys and girls separately are more or less similar to those obtained for total sample. The mean performance of both boys and girls on creativity measures depicts a progressive increase from 7+ through 11+ years punctuated with a decline at 9+ age on originality and elaboration. This decline is more noticeable in case of girls (t=2.01 and 3.94 on O and E respectively) than boys which needs further validation and expression in the light of Torrance (1962), who remarked that the marked decline at the age of nine years was accompanied by problems of behaviour, learning difficulties, delinquency, and personality disturbances. The causal factors of greater decline among girls as compared to boys may be looked into cultural and other nurturing patterns which tend to differ during the growth period of boys and girls.

3.4 Rational of the Study

From the review work in the foregoing section, the several points for developing the creativity in a class room are worth to be noted.

1. Many researches have been done for measuring the I.Q. of the children but very few researches have been done to measure creativity of the children, so it is
worthwhile to develop creative ability test to measure the creative level of school children.

2. Most of the researches in education were undertaken for the secondary school children but there is no such study ever made for the creativity measurement of the primary school children who are considered to be creative-minded.

3. On reviewing the test construction it was found that most of the creative tests include verbal creativity, non-verbal creativity and figural creativity, but numerical creativity was not measured till now. Therefore, the investigator decided to introduce one such sub-test in creative test so as to measure numerical creativity of the children.

4. On surveying the creativeness of the children studying in II to V a clear picture of various levels of the creativity and its trends would be perceived in this study.

Thus the present study should be very useful to the teachers and taught who are in the field of primary education.