

## CHAPTER IV

DEVELOPMENT OF VERBAL CREATIVITY INSTRUCTIONAL  
MATERIALS AND THEIR VALIDATION4.0.0 Introduction

The nature of instruction in our classrooms has been explained in chapter I, section 1.0.0 from the creativity view point. Our classrooms are yet to become centres of inquiry so that the children could think, investigate and find out for themselves, than to be told about. Many of the teachers and the experts in the field of instruction have been doing their best, in their own way to redress the situation, but we are yet to go a long way to reach the goal.

Most of the children eventhough they have the creative potential, they have not been able to express it, mainly because the existing instructional materials have not been designed keeping the creativity of students in mind. If attempts are made to construct new instructional materials or refine the present ones, so that some cognitive skills like fluent thinking, flexible thinking, etc., could be nurtured, the school would simply become a better place to work. The children, because of such programmes, would become better thinkers and consequently there would be derivative changes

in all spheres of life. Therefore, it seems worthwhile to nurture the creative potential of children through instructional materials.

In using instructional materials to teach processes, it is felt that they can help not only in memory and reasoning processes, but can also most probably help in developing creative and all other instructional processes, discovered to date through research. There is a challenge to try to develop instructional materials at all age levels requiring each different type of intellectual process and to determine the best age level for the most intensive practice in each process. It should be stimulating to try to produce instructional materials that place high value on originality and on high quality products, but at the same time that are so formulated that they are not out of the reach of students (Taylor and Williams, 1966).

The authors have aptly summed up the universe of challenges that are ahead of creativity researchers, who would like to develop instructional materials and have also cautioned them regarding the complexities. A review of different techniques and instructional materials developed to foster the creative thinking abilities of children has been done in chapter II. A short review of the models for

constructing creativity instructional materials would further help the investigator in the development of his own 'scheme of activities' to foster the creative thinking abilities of sixth standard children. The models generally provide the theoretical background, rationale and the functional details of a set of creativity instructional materials.

Torrance (1978) reports five most useful and available models for constructing creativity instructional materials and describes their essential elements.

#### 4.0.1 A Short Review of the Five Models

(a) Creative Problem Solving Model : This model was conceptualised by Osborn (1963) and refined by Parnes, Noller and Biondi (1977).. This creative problem solving model can be applied to any subject matter and can be taught as early as pre-school years.

Osborn's book emphasizes the importance of imagination in all walks of life, the universality of imaginative talent and the use of creativity in all stages of problem solving. The students are taught the above concepts along with the following : (i) perceptual, emotional, and cultural blocks to creative thinking are demonstrated and discussed; (ii) the

principle of deferred judgement, that is, artificially separating creative from judicial thinking at various stages of problem-solving; (iii) within the 'free wheeling' atmosphere, students are given the practice of attribute listing, checklist procedure and forced fit techniques.

Importance of record keeping, setting deadlines and quotas for production of ideas and setting aside certain times and places for deliberate idea production, are stressed.

(b) Lateral Thinking Model : This model was developed by DeBono in 1970. The ideas and activities based on this model could be taught throughout the educational levels from primary grades through college and adult stage. These are being widely used in primary and secondary schools in England.

Lateral thinking is closely related to insight, creativity and humour. Insight and humour both involve the restructuring of patterns. Creativity also involves restructuring of patterns, but with more emphasis on the escape from restricting patterns. Lateral thinking involves restructuring, escape and the provocation of new patterns. It is concerned with generation of new ideas, and a way of using mind as well as a way of handling information.

The important techniques are generation of alternatives, challenging assumptions, designing, fractionation, reversal

method, and translating into analogies, etc. The key elements are lateral (as well as vertical, which is selective, analytical, finite process) thinking, deliberate use of different points of view, use of chance ( whereas, in vertical thinking one concentrates and excludes what is irrelevant ), right hemisphere processing of data ( which is endowed with visualisation, imagery, creativity, metaphorical and intuitive thinking ).

(c) Sociodramatic Model : The model conceptualised by Torrance (1975) synthesises the psychodramatic and socio-dramatic production techniques of Moreno and his associates, the creative problem solving process as conceptualised by Osborn, Parnes and associates, and concepts concerning different states of consciousness. This model is exceptionally useful in studying the future problems ( similar to consequences situations ) and in achieving the instructional goals of career education ( similar to simulating the administrative and other decision making situations ). However, the model can be applied to the subject matter of almost any academic discipline at almost all levels of education. But there is little literature developed on this model, eventhough there is wealth of materials on psychodrama and role playing. Key elements have been Drama, Creative problem solving, drama

production techniques. Audience reactions, different states of consciousness ( Drama being a good situation of bringing the ideas of preconscious to conscious and getting emotional Catharsis )

(d) Before, During and After Model by Torrance (1969) :

This model was initially developed for use by authors of the Ginn Reading 360 programme. It is a simple model to implement, yet one that permits and stimulates the creativity of the teacher or instructional materials developer. This model emphasizes activities at the beginning of a lesson to heighten anticipation, expectation and motivation to learn and think, followed by activities that help students to dig deeper, re-examine and resolve discrepancies, and terminated by activities that sustain motivation and keep learning and thinking going on after the lesson is ended. The key elements have been, activating the creative processes, heightening motivation, sustaining motivation, going beyond the book and the classroom and right and left brained processing of information.

(e) William's Cognitive Affective Model : This model was developed and elaborated by Williams (1972), and has been widely used by teachers of gifted students in constructing lessons in almost all academic disciplines.

Williams has provided a kit including Cassettes, posters, books, cue cards, media resources and the like for implementing this model. A strength of this model has been that it emphasizes bridging of the gap between affective and cognitive learning. The key elements have been emphasis on bridging the gap between cognitive and affective learning, interaction among teacher behaviour ( strategies or modes of behaviour ), pupil behaviour and curriculum ( subject matter content ).

The creative problem solving model emphasizes more the cognitive aspects of creativity and sociodramatic model, the affective aspects. It is the William's model which tries to bridge the gap between the two types of learning. Lateral thinking is more deliberate a process of using mind, as definite as logical thinking - but in a very different way. It enhances the effectiveness of vertical thinking. Vertical thinking develops the ideas generated by lateral thinking ( similar to induction - deduction approaches ). The before, during and after model restricts itself to reading only, but how best could it be done in terms of creativity fostering is emphasized in this model.

The first two models are complementary to each other and the third one is a combination of two and all the three require long time to develop instructional materials based

on them. The fourth one is a general one, with emphasis on breaking the patterns, challenging assumptions and generating ideas. As, the before, during and after model has a restricted domain, the Lateral thinking model could serve the purpose well in India. The activities given by DeBono seem to hold good even in Indian setting, that is, the practise items are culture-free. In Indian classrooms the vertical thinking as opposed to lateral thinking is being emphasized. The differences between the two are fundamental and quite distinct. It is not a matter of one process being more effective than other for both are necessary. It is a matter a realizing the differences in order to be able to use both effectively. Therefore, the Indian teachers could easily understand the distinct features of both and effectively make children use them to become effective thinkers.

India

But in creativity researches in none of the above models has been completely followed, only parts of them have been considered. Pillay (1978) and Deshmukh (1977) used 'brainstorming technique' enunciated in 'the creative problem solving model'. Deshmukh combined <sup>this</sup> with 'role playing' of 'Socio-dramatic model'. Nirpharake (1977) used the ideas of 'The creative problem solving model', but

developed his own scheme of activities more near to the culture and ethos of the land. All the studies at Ph.D. level, viz., Pillay (1978), Deshmukh (1977) and Nirpharake (1977) have used largely the techniques developed abroad, eventhough some adaptation has been done, with respect to the content of the instructional materials. But hardly any study has been conducted, in which new models have been developed, which are suitable to the culture and ethos of this country. The investigator undertook the challenging job of constructing verbal creativity instructional materials keeping the above criticisms in mind. He, with the help of experts' opinion, library reference and his experience as a teacher in dealing with creative children decided to construct a new 'scheme of activities', i.e., verbal creativity instructional materials.

#### 4.1.0 Assumptions

The verbal creativity instructional materials were developed with a few assumptions. The assumptions could be described as presumed facts accepted as the best knowledge but subject to change or modification. These are obtained through methods of induction or derived through observation and experience including experience of experiments. The reasons for having assumptions in the beginning of this

developmental study are : (i) the assumptions provide the base for development of new knowledge in terms of construction of new instructional materials ; (ii) they tend to be 'conventional wisdom' derived from observation and experience, (iii) they can be subjected to empirical testing unlike a 'a priori' assumptions; and (iv) they provide guidance and direction throughout the development of instructional materials.

The fundamental assumptions being that of leading researchers in the field of creativity like Covington, Crutchfield, Davies and others, which were shared by the investigator also. They are (i) All children regardless of age or initial intellectual level, fall far short of realizing their potential for creative thought; (ii) these individuals can be helped through instructional process to make fuller and more appropriate use of their capacities by means of systematic and direct training of certain cognitive skills ( like fluent thinking, flexible thinking, etc.); and (iii) one more assumption the investigator made was that every culture has with it a repertoire of creativity fostering techniques or methods. The riddles, folk tales, fables, etc., could be used for developing creative thinking and lateral thinking (DeBono, 1970). A detailed discussion of how culture acts as the source for developing creativity instructional materials will be made in section

#### 4.1.1 Characteristics of Verbal Creativity Instructional Materials

On the basis of the above assumptions, the nature of the children of standard VI in terms of their likings, interests, etc., the investigator decided to have the following characteristics in the verbal creativity instructional materials, before they were developed. These characteristics served as the frames of reference in developing chapters 2 to 8 in the instructional materials. Consultation with experts and library reference gave rise to one more characteristic, which was incorporated later, viz., the introduction of an informative chapter on creative process, simple creative products, how creative people think, etc. These characteristics of the creativity instructional materials have been briefly delineated below.

(1) There would be an introductory chapter, explaining the creative process, the simple creative products, the experience of creative men and women, etc. Torrance (1964) cites the experiment of Anderson (1963) which indicates that, just the giving of information about the creative process, overcoming blocks to creativity and the like, result in significant creative growth not ordinarily achieved.

(2) Adventurous, fantasy and other types of stories were to be written / opportunities created, specially for this purpose, keeping in mind the Kannada vocabulary of standard VI children. Bagley (1978) in an experiment gave a structured fantasy using autogenic suggestion techniques presented in a metaphoric mode to relax them. In the state of supposed receptiveness it was suggested that they consider a number of personality traits which they had, but which may not have been considered lately. The traits called to their attention were affective in nature and commonly found in creative individuals.

The results indicated that 'Structured fantasy' used to enhance relaxation and positive, relevant, creative role assumption presented in a metaphoric mode ( to minimise defenses ) increased creative problem solving performances. It was found that overall fluency and flexibility scores increased significantly, than originality, when compared to the controls. Apart from this evidence, the primary children like stories, and it is a common instructional experience that the story telling method makes a significant impact on them also.

(3) The creativity fostering components which were to be introduced at strategic points in the stories were decided.

Four of the creative problem solving type were puzzles, Riddles, Divergent problems and Mystery plots, one for development of imagination was consequences situations, Three of the creative expression type were Story writing, Poem writing and Riddle construction.

Solving puzzles, Riddles, Mystery plots and Divergent problems could be called creative activities, because they fulfil one or more of the following conditions : (i) the problem as initially posed is vague and undefined so that part of the task is to formulate the problem itself; (ii) the thinking is unconventional, in a sense that it requires modification or rejection of previously accepted ideas; (iii) the thinking requires high motivation and persistence, taking place either over a considerable span of time ( Continuously or intermittently ) or at high intensity; and (iii) the product of the thinking has novelty and value, either for the thinker or for the culture, which means the problem has been solved for the first time by the student or his answer may be one in hundred responses of the group (Newell, et al. 1962).

(4) It was decided to introduce two characters, viz., Manju and Kamali, a VI standard boy and a V standard girl, brother and sister, in all the stories and portray them as creative children. The intention behind this was to

make these children serve as 'Identification models' to the VI standard children who would use these instructional materials.

By reading of the favourable problem-solving attitudes of the story characters, students learn to value unusual, new ideas in their own problem-solving and to be receptive to those of others (Davis, 1971). In the words of Covington, (1968), the identification model technique is intended to introduce the child gradually to the difficult and often frustrating process of becoming a more effective thinker. It was the hope of the investigator that the process of identification models becoming confident in their own abilities will foster in the child a sense of his own progressive improvement.

(5) The components were to be introduced at the strategic points in the stories ( one per story ), to enhance the curiosity and motivation of children, to know what happened next in the story.

(6) The traditional folklore of Karnataka was to be tapped in the form of folklore, poems, riddles, etc., that is, the instructional materials were to be made culture-specific, particularly suitable to the children of that culture only

( Vide assumption No. 3 ).

Covington (1968) distinguishes between two types of problems, viz., hypothetical and enduring, for fostering creativity. The examples of hypothetical problems are the consequences situations. The examples of the enduring problems of man and society are found in literature, such as Greek myth of Sisiphus, dealing with man's reluctance to accept his fate; the tragedy of Frankenstein, reflecting the consequences of man's age-old dream of creating a more perfect being in his own image; or the mythical Icarus, personifying man's unflagging zeal to explore nature regardless of the consequences, etc. Covington here emphasizes that culture could be a great source of problem-solving tasks, which children could practise now, to prepare them for their roles as the innovators of the future.

Torrance (1971) points to the historical evidence, viz., great number of musicians in the period of a single century in Europe, great artists and sculptors during renaissance, so many inventors in the nineteenth century, Australia producing good tennis players, many Negro athletes in the decade 1957-1967, etc. Further evidence of power of cultural influences in the nurture of creative development and functioning is indicated through cross cultural studies. For example, in United States after about age ten, girls consistently perform

better than boys on almost every kind of verbal test for creative thinking. In India, however, two investigations independently done and about five years apart, found that boys excelled girls in practically all of the same verbal tests. Prakash (1963), Raina (1966). It was also found that children in India perform disproportionately better on verbal than on figural tests of creativity, and, children in western Samoa, Negro children in Georgia and lower class children in Pittsburgh performed better on figural than on verbal tests (Torrance, 1974). It is difficult to believe that children in India are born with better verbal than figural creative thinking abilities and that the reverse is true in western Samoa, or in the United States girls are born superior to boys in respect of verbal creativity and that reverse is true in India. Differences in the nurturing influences of the cultures involved help explain these differences. The investigator extended the logic and assumed that every culture has with it certain methods and techniques and accompanying values of fostering creativity also. It also means that students of that culture group would benefit most from such culture-specific instructional materials.

#### 4.1.2 Selection of the Components

The investigator selected eight components for the purpose of fostering creativity. The components appear in the same order

in the verbal creativity instructional materials as they have been presented here. The reason for having this order relates to a generally accepted principle in any instructional process, viz., simple to difficult. First, the development of imagination through consequences situation, then creative problem solving through puzzles, riddles, divergent problems, and mystery plots, and lastly, creative expression through writing of stories, poems and construction of riddles, were thought to form the ladder of simple to difficult. Each of the components have been delineated in terms of what it is, and how it may help fostering creativity in children along with mentioning the theoretical model or any supportive evidence that speaks of its creativity fostering potential.

(4) Consequences Situations : Given certain conditions such as a world in which time runs backwards, what are all the consequences ? Such problems demand cognitive flexibility, imagination and ability to adopt temporarily real a set of new and unfamiliar assumptions ( Covington, 1968 ). These call for ability to go beyond the general 'matrices of thought' as suggested by Koestler (1969). Answering problems regarding consequences situations would be training in 'spontaneous flexibility' and 'originality', as per the 'Structure of intellect' model. (SI model ) of Guilford (1959). Through

conceptualisation and by factor analyses have emerged primary intellectual factors that account for individual differences in creativity.

Puzzles : The puzzles, both verbal and mathematical vary from naive amusement to sophisticated problems, some of which have never been solved. Ex. : Koningberg's bridge, Hanoi tower, etc. puzzle solving has universal appeal, as the urge to solve the puzzles is manifested alike by young and old, who, by solving get an intellectual kick. The puzzles can be categorised as, those involving the manipulation of objects and those requiring computation. The first requires little or no mathematical skill, merely general intelligence and ingenuity ( Encyclopaedia Britannica, 1978). Puzzles require the students thinking back and forth and solving of them is considered as a creative exercise ( Osborn, 1971 ). Many times ; we get the wrong answers and so breaking the set becomes necessary, that is, we are redefining the ideas. In other words, solving of puzzles, would be training in 'redefinition' and 'adaptive flexibility' as per the SI model.

Riddles : Riddle is a statement or question having a double or veiled meaning, put forth as a puzzle to be solved or something to be guessed. There are two types of riddles : enigmas, which are problems generally expressed in metaphorical

or allegorical language and which require ingenuity and careful thinking for their solutions; and conundrums, which are questions whose effects are based on punning, in either the question or answer. Ex. : What is black and white and 'red' all over ? is a popular children's conundrum. The answer is 'a newspaper' which depends on a pun on the word 'red'. The solving of riddles are a part of children's play in many societies. The solving of riddles resemble the famous principle of 'Synectics' used in developing creativity, viz., 'Making the strange familiar.' This would in turn become training in 'Ideational fluency'.

(4) Divergent Problems : The divergent questions, as opposed to convergent questions, seek more than one answer. The emphasis would be on various types of answers for the same problem, which call for abilities like 'Ideational Fluency', 'Originality' and 'Redefinition' ( of SI model ). The solving of such problems free the students from the Constraints of Einstellung, that is, the tendency of the mind to resort to same type of thinking or mode of response, etc.

(5) Mystery Plots : Mystery plots are like 'pure' detective stories, where an intellectual contest takes place between the reader and the writer ( and his fictional detective). They require strict fair play with the reader

in that he has the same exposure to the clues as the detective and an equal opportunity to reach the solution (Encyclopaedia Americana, 1976). The children have to assume the role of a detective, and have to logically interpret evidence, analyse motives and clues, and solve the crimes, that are baffling the police even. Mystery plots resemble the type of thinking enunciated in the definition of creativity by Torrance (1969), that is, sensing the gaps, catching the most unexpected clue to solve the problem, along with the ability to analyse the situation and search for various alternatives to crack the plot. Solving of mystery plots would provide training in 'Redefinition' and 'originality' as per the SI model.

(6) Story Writing : Story writing had been utilised as an aspect of creative expression involving abilities like organization and elaboration of ideas, using the words in different contexts and developing imaginative plots with strategic twists. In other words, story writing exercise would be training in 'Originality', 'Associational Fluency' and 'Expressional Fluency' of SI model.

The four stages of story writing were to be (i) writing the unusual titles for given stories ( Guilford, 1959)  
(2) Completing the stories when outlines were given,

(3) completing the second half of the story, when first half was given ( Olson, 1978 ), (4) Writing the full story when an imaginative title or an idea was given (Torrance, 1969).

(7) Writing of Poems : This component aimed at students using figures of speech, rhyming words and seeing words from different view points, etc., to arrive at a new symbolic presentation of ideas. It would also mean training in 'Originality', 'Expressional Fluency' and 'Associational Fluency'. Torian (1977) found that children have a strong affinity for the poetic form of creative writing, through which they freely and imaginatively express their individual thoughts, feelings and desires in a creative and rewarding voice and style that is in tune with their nature. Therefore, children are to be given opportunities of writing poems. It was thought fit to give the writing of poems at 3 stages. (1) Writing unusual titles for the given poems, (2) Completing a poem when a line or half the poem was given, (3) Completing the poem when an idea or a title was given.

(8) Riddle Construction : This component resembles the second principle of 'Synectics', viz., 'Making the familiar strange', by the use of four types of analogies, personal, direct, symbolic and fantasy. When an object or an idea <sup>was</sup> given, the students were to construct riddles, using the four types

of analogies. In other words, it would become training in 'Associational Fluency', 'Expressional Fluency' and 'Ideational Fluency' of SI model. Construction of riddles, according to Plato, was an important pasttime in his times for boys and youths (Ragow, 1970).

The component was to be introduced in two stages.

- (1) Completing the riddle when half the riddle was given,
- (2) Constructing a riddle, when an idea or an object was given.

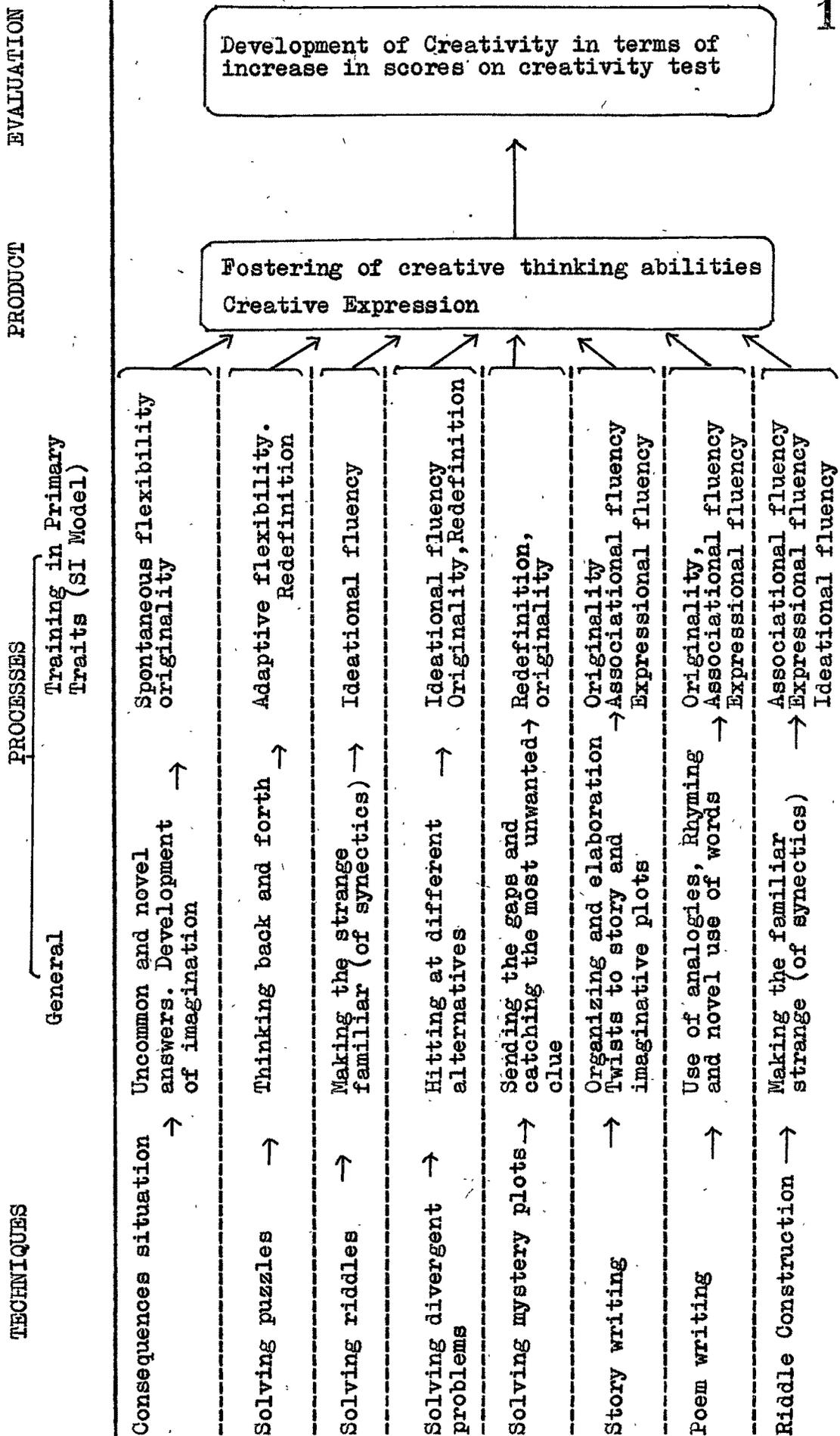
Keeping all the above considerations, evaluation of the instructional materials, etc., in mind, a flow chart was developed, which has been presented in page no. 113

#### 4.1.3 Writing of First Chapter and Stories

Introduction : The first chapter viz. Introduction ( Vide appendix Q ) started with a friendly address 'Dear Children' and the investigator went on talking about the highly creative poets, Engineers, Scientists of Karnataka. Simple examples of creative work, the efforts of creative people, the process of creation, etc., were explained in detail, but using simple words. Guidelines were provided as to how to take the materials also.

Kalyani : The second chapter had a story by name 'Kalyani' (Machine that travels in time) which was a science fiction.

FLOW CHART



Manju the identification model ( Vide section 4.1.1 ) travelled in time to 2080 A.D. and returned. The story was so constructed as to introduce 'Consequences situations' in a strategic point.

Visit to the City of Fishes: The third chapter had a story, viz. 'Visit to the City of Fishes' in which Manju and Kamali, the identification models ( Vide section 4.1.1 ) visited an underwater city. This story had 'Puzzle solving' as an activity in it.

Village for the Old and Retired : The fourth chapter had a story based on social invention, viz. 'Village for the Old and Retired.' Manju and Kamali visited such a village and participated in 'Riddle solving' programme of the old men and women. The sampled children were to solve the riddles, in place of Manju and Kamali.

Manju in an Unknown Island : The fifth chapter had a story based on adventure of Manju, viz., 'Manju in an Unknown Island.' Manju survives in a ship wreck and reaches an unknown island, where he solves some of the 'divergent problems'. He returns to India using this creative abilities only.

A New Approach to solve Mysteries : The sixth chapter had a story on detection of theft and murder mysteries, viz. 'A New Approach to Solve Mysteries.' Manju, like the sampled children solves the mystery plots and at the end detects a

theft case in his cousin's house.

Children's Story Writing Competition : The seventh chapter had a competition in which the children of Karnataka participated along with Manju and Kamali, viz., 'Children's Story Writing Competition'. The children wrote stories in response to an advertisement in a famous Kannada daily. The story writing was introduced at four stages : (i) Writing unusual titles for the given stories; (ii) writing a full story by filling some words and phrases; (iii) writing the latter half of the story, when the first half was given; and (iv) writing a full story when an imaginative caption or idea was given.

Face to Face with Barbarians : The eighth chapter had an adventurous story with sufficient risks in which Manju and Kamali took part, viz., 'Face to Face with Barbarians'. The sampled children along with Manju and Kamali had to construct poems as the nature of the story demanded. The construction of poems was introduced at three stages : (i) Writing unusual captions when the poem was given; (ii) writing the remaining lines, when a part of a poem was given; and (iii) writing a full poem when an idea or an image was given.

A Picnic : The ninth chapter had the story of a picnic, where the trials and tribulations, the creative children have

to undergo were depicted. Manju and Kamali were the butts of sarcasm and criticism of their classmates which results almost into fighting at 'A Picnic'. The teacher who diffuses the situation arranges a competition of 'Riddle Construction'. The sampled children had to construct riddles at two stages :

- (i) Completing the riddle, when half of it was given; and
- (ii) Constructing the whole riddle when an idea or object was given.

#### 4.1.4 Selection of Puzzles, Riddles, etc., for Inclusion in the Instructional Materials

The investigator collected a large number of puzzles, riddles, etc., from various sources. They were presented to a set of teacher educators and researchers, who acted as the judges. The investigator provided them with a set of criteria for selection, with respect to each one of the components. They were to go through all the puzzles, riddles... etc., and mark them 'S' for suitable, 'N' for not suitable, and 'U' for undecided, keeping in mind the criteria provided to them ( Vide Appendix A ).

After collecting the data sheets from the judges, the investigator tabulated the results. The puzzles, riddles ... etc., which were marked 'S' by two or more judges, were taken for inclusion in the verbal creativity instructional materials.

instructional materials. Totally, 15 consequences situations, 30 puzzles, 45 riddles, 14 divergent questions, 12 mystery plots, 32 stories / captions, 8 for each one of the four stages, 32 poems / captions, approximately 10 for each one of the 3 stages and 14 half riddles / 26 ideas were selected. These components were included at strategic points in the stories. The stories were checked once again for the complementary nature of the content of the story and component. It was seen that in the puzzles, riddles... etc., no undue advantage occurred to male/female or urban/rural children, etc., or to any one of the special groups who would be using these instructional materials. Necessary modifications were made to satisfy the above conditions and the materials were translated into Kannada.

#### 4.2.0 Formative Evaluation

Formative evaluation is used to improve the instructional materials at various stages of its development, so that the instructional materials become more functional and meaningful.

The formative evaluation in this study consisted of finding the content validity, by expert's opinions, finding the suitability of words and phrases of the verbal creativity instructional materials, and conducting a pilot study. These different steps of formative evaluation taken recourse to in

the present study have been described in the sections to follow. (Vide page no. 119 )

#### 4.2.1 Finding the Content Validity of the Instructional Materials

The Kannada version of the instructional materials were got typed and were given to 10 judges. The composition of the judges was 2 rural primary teachers, 2 urban primary teachers, 2 primary teacher educators, 2 secondary teacher educators, and 2 curriculum experts of DSERT, Bangalore. The reason for choosing these categories of judges has already been mentioned in chapter III, p. 79 . All the judges were requested to go through the entire material and give their reactions on a reaction questionnaire supplied to them (Vide Appendix B ). Empty sheets were provided to them for writing additional comments.

The reactions of the judges were consolidated and suitable decisions were taken. Some of the important decisions were incorporated in the instructional materials.. The judges had unanimously opined that verbal creativity instructional materials were capable of fostering creativity, as the components have been integrated well with the stories and children could exercise well on them.

#### 4.2.2 Finding the Suitability of Words and Phrases in the Instructional Materials

Three sixth standard children, one from rural area, one from urban area and one who had migrated to urban area six months back, were requested to go through the entire instructional material. The reason for selecting such children has already been given in Chapter III, p. They were asked to underline the difficult words and phrases, when they read them through.

The investigator took the village child's underlinings as important and replaced those difficult words and phrases by simple words. This was done mainly to make the verbal creativity instructional materials self-instructional and self-expressive, that is, the child could go through on his/her own, without the help of an instructor and start answering the components or expressing himself/herself through words.

#### 4.2.3 Development of Norms for Passi Tests of Creativity on VI Standard Children of Bangalore District, Karnataka

The investigator selected the Passi tests of Creativity keeping in mind the operational definition, complementary nature of the factors of the tests and the nature of the verbal creativity instructional materials. As the materials

constructed were in verbal form, the investigator was in need of verbal tests only. The Passi tests of Creativity had verbal forms and nonverbal forms. The Passi tests of Creativity had the following characteristics :

- (1) The tests were originally developed for boys and girls of IX, X and XI standards.
- (2) The tests were developed for students of rural and urban areas of Punjab, Haryana and Union territory of Chandigarh.
- (3) The tests were in Hindi and English languages.
- (4) The tests had both verbal and non-verbal tests totally six, developed in 1971.

The investigator wanted to find out the dependability/ suitability of these tests ( verbal ) on the sample of Bangalore district, the main reasons being that he wanted only four tests in Kannada language for VI standard children, as they would be used as pre-test and post-test in both the pilot study and validation study. The time duration of each test was increased to one and a half times, as the level of the original test was reduced and the VI standard children would not be fluent and fast in writing. Considering all the above points regarding the Passi Tests of Creativity it seems clear that new norms were to be developed before utilising the test as a tool in the present study. (Vide p. )

#### 4.2.3.1 The Procedure

The four tests, viz., Seeing Problems Test, Unusual Uses Test, Consequences Test and Test of Inquisitiveness were translated into Kannada by the investigator. The Kannada version was shown to teacher educators and Kannada Pundits and suggestions for improvement were sought. After incorporating the suggestions, the final draft was got printed. A very important suggestion being the change of example in the Consequences Test, viz., 'If the force of gravity of earth vanishes', owing to the difficulty of the concept involved. It was replaced by a simple example, viz. 'If the hairs on the human head vanishes'. The final form of the test could be found in Appendix C , which contains the same items of the original test.

#### 4.2.3.2 Sample

Bangalore comprises 3 districts, viz. Bangalore - South, Bangalore - North and Bangalore - Rural. The data regarding the number and types of primary schools in each district were obtained from the concerned, Deputy Directors of Public Instruction.

Fifteen primary schools, 5 from each district were selected giving proportional representation by type of schools and keeping in mind geographical location too. The investigator

himself administered the tests in all the 15 schools and totally 570 children formed the sample. The test papers were scored by the investigator, following meticulously the directions for scoring given in the test manual (Passi, 1979). The fluency, being the number of relevant responses, the flexibility, being the number of different categories of responses as classified in the manual, the originality being the uncommonness of the response with 4 for highly original response and zero for unoriginal response, the test of inquisitiveness being the relevant and mutually exclusive questions asked by the children about a metronome and a placard displaying the sentence 'A few children cannot touch it.' Owing to paucity of time, the investigator had to use originality weightages given in the manual and could not develop new ones for VI standard sample. But, the same tests were used as pre-tests and post-tests, and therefore the error that crept in, got nullified.

#### 4.2.3.3 Analysis

The sample creativity scores were subjected to descriptive statistical analysis, in terms of mean, standard deviation, kurtosis, skewness etc. which have been presented in

#### Appendix

The names of students in each school was alphabetically arranged and the first four names from each list was taken,

that is, 60 students, formed the sample for reliability study. The reliability coefficients were calculated using the split-half technique by taking odd and even item scores of first three tests. As the fourth test had a single item, the technique could not be applied there. The test-retest method was not possible because of shortage of time, and parallel forms of Passi tests of Creativity were not available to use the parallel forms method. A comparative picture of the reliability coefficients calculated and that of the manual is presented in a table.

Table 4.1.A: Showing Reliability Coefficients of Sub-tests

Reliability Coefficients of Sub-tests ( $r_{11}$ )	Present Study	Test Manual
(1) Seeing Problems Test	0.80	0.88
(2) Unusual uses test	0.63	0.51
(3) Consequences test	0.56	0.80
(4) Test of Inquisitiveness	--	--

The percentile norms (decile norms) for each test, sexwise and residencewise were computed and tabulated. A perusal of the descriptive statistics, percentile norms, and reliability coefficients of the tests, in comparison with that of Passi Tests of Creativity, given in the manual, gave confidence to the investigator that these tests were suitable for VI standard children of Bangalore, Karnataka.

#### 4.3.0 Pilot Study

In order to develop verbal creativity instructional materials on proper lines, formative evaluation has been done at various stages. A pilot study becomes part and parcel of the formative evaluation, as it helps to know, how the instruments work, whether the instructional materials bring in the desired changes in the students, etc. It also helps in modifying the instruments or approach of the study or the instructional materials intelligently. The statistical analysis has also been included in the pilot study, as it serves the purpose of knowing the workability of instructional materials through gains in creativity scores or gains in teacher ratings, etc. Sections 4.3.1 to section 4.3.7 form detailed description of the pilot study.

#### 4.3.1 Instrumentation

Apart from the Passi tests of Creativity following tools were also developed to validate and modify the verbal creativity instructional materials.

Construction of a Creativity Rating Scale : The Creativity Rating Scale was constructed for teacher rating of creativity on the lines of an observation schedule developed by Foster (1971). The purpose of this scale was to validate instructional

materials in terms of the behavioural changes that are brought about by the instructional materials, and rated by teachers. The dimensions used were Fluency, Flexibility, Originality, Inquisitiveness and Elaboration. Each one of these dimensions were defined in non-technical terms for the benefit of easier comprehension by teachers. They were asked to rate each student on a five point scale, viz., 5, 4, 3, 2, 1 with 5 denoting highest and 1 denoting lowest in case of each of the variables. The same dimensions were noted by Guilford and (1959) used by Torrance (1962) to identify areas of creative thinking for a different purpose. The creativity rating scale can be found in Appendix E.

Construction of a Reaction Questionnaire for Students : A  
reaction questionnaire entitled 'My Experiences with Creativity Instructional Materials' was constructed with subparts for each one of the nine chapters. Detailed questions were put so that the students can think and answer the questions. The reaction questionnaire was translated into Kannada and validated with the help of experts. The purpose of this reaction questionnaire was to get the frank and free opinions of students, so that the verbal creativity instructional materials could be modified to suit them better. The reaction questionnaire can be found in Appendix F

#### 4.3.2 Selection of Schools and Orientation Programme for Teachers

Two higher primary schools were selected for pilot study one in Bangalore city and one in Bangalore rural district. They were women's peace League Higher Primary School, Basavanagudi, Bangalore and Bapu Higher Primary School, Harohalli, Bangalore rural district. These schools were selected keeping in mind the cooperation the head masters gave to research workers. The head masters of high schools run by the same management and located in the same building were also requested to cooperate in the project.

The teachers of both the schools who were handling VI standard class were called to R.V. Teachers College for an 'Orientation programme on creativity instructional materials'. The programme was organized by the Department of Extension Services, R.V. Teachers College, Bangalore, which provided the venue for the programme. The details of the programme can be found in Appendix G<sub>1</sub>. The participants evinced keen interest in knowing more about creativity and instructional materials. They were also oriented regarding the use of creativity rating scales in their schools.

#### 4.3.3 Pre-test

The teachers observed small groups of VI standard children for period of three days, keeping the dimensions of

creativity in mind, and rated them on creativity rating scales provided to them. Two teachers rated one student and so two ratings were got for each one of the students. The investigator administered the Passi tests of Creativity as the pre-test in both the schools, as per the directions provided in the test-manual.

#### 4.3.4 Treatment

The verbal creativity instructional materials with sufficient space for responding were got cyclostyled and provided to the students in both the schools. The first informational chapter was discussed at the end of three periods to know the extent of comprehension of students. The remaining chapters were handed out to the students sheet by sheet, and they were encouraged to read on their own. Sometimes, the story part was read by the investigator, owing to lack of time, and the duration of period being only 40 minutes. The children took to solving of puzzles, riddles with lot of interest and they were specially interested in knowing what happened next in the story. The usual questions were, what happened to Manju and Kamali ? How did they come back ? etc. Most of them completed the home work given to them. As the sheets were handed over to them one by one, they did not have the opportunity of taking tuition at home beforehand. They were encouraged to

complete the problems in the class itself, where positive reinforcement and lot of freedom to move, talk to the teacher, etc., were provided. A student even preferred to sit under the table and think. The investigator had tough time in controlling them as many would run to the table to show their answers. They were told not to give out the answer, but to write it on the sheet and show it to the investigator, as a loud answer by the student may stop the thinking of others. The stories, poems, etc., were of special interest to them in the latter half of the instructional materials.

The investigator maintained the same amount of time, the time, the sequence, etc., in both the schools. He preferred not to know the students by name, but by face, as the knowledge of name might bias him during scoring of the tests. An interesting incident was that the teachers of both the schools complained that they were hard put to control the students after the investigator's period, as he would provide lot of freedom in his period. They preferred giving afternoon periods to remedy this situation, in the latter half of the experiment. The experiment went on for 45 days taking equal number of periods in both the schools. The students completed the first four parts of the reaction questionnaire after four chapters had been completed, then they completed

the other parts after every two chapters were over.

#### 4.3.5 Post-test

The investigator administered the same four tests, viz., Passi tests of Creativity after the treatment was over. The same teachers observed the same students again after the treatment and two ratings were got for each student in both the schools.

#### 4.3.6 Analysis and Interpretation of the Quantitative Data

The pre-test and post-test answer scripts were scored after the experiment, meticulously following the directions given in the test manual. The creativity rating scales were scored by summation technique, and the average of the two scores were got. 't' tests for correlated means and independent means were used to analyse the data, mentioned above.

Table 4.1B: Showing the Significance of Difference Between Means of Pre-and Post-test Scores (Correlated Means)

Name of the School	N	Post Mean	Pre Mean	t	Significance
School 1	51	80.84	67.45	3.83	S(P < .01)
School 2	36	69.22	49.56	4.52	S(P < .01)
School 1 + 2	87	76.03	60.05	5.83	S(P < .01)

Note : School 1 is W.P.L. School, Bangalore and School 2 is Babu Primary School, Harohalli.

As the 't' values were sufficiently higher than the corresponding table values, they indicate that verbal creativity instructional materials were able to bring in significant gains in urban group, rural group and together also.

Table 4.2 : Showing the Significance of Difference Between Means, Sex and Schoolwise Between Pre-and Post-test Scores (Correlated Means)

Name of the School	N	Post Mean	Pre-Mean	t	Significance
School 1 :					
Boys	21	89.05	73.95	2.62	S(P < .01)
Girls	30	75.1	62.7	2.82	S(P < .01)
School 2 :					
Boys	25	69.52	51.12	3.58	3(P < .01)
Girls	11	68.55	46	2.67	S(P < .05)

Note : School 1 is W.P.L. School, Bangalore and School 2 is Bapu Primary School, Harohalli.

As the 't' values were above the corresponding table values, they indicate that Boys or Girls belonging to urban or rural school have gained significantly because of verbal creativity instructional materials.

Table 4.3 : Showing the Significance of Difference Between Means of Boys and Girls in Pre-test and Post-test Scores (Independent Means)

Pre Test	Boys (46)	Girls (41)	t	Significance
Means	61.54	58.37	0.37	N.S.
Post Test				
Means	78.44	73.34	0.49	N.S.

As both the 't' values were below the corresponding table values, they indicate that Boys and Girls do not differ significantly in their creative abilities before the treatment and after the treatment in the present sample.

Table 4.4 : Showing the Significance of Difference Between Means of Ratings in Different Schools (Correlated Means)

Name of the School	N	Post Rating	Pre Rating	t	Significance
School 1	50	12.96	12.83	0.34	N.S.
School 2	26	13.9	9.98	4.9	S(P < .01)
Schools 1+2	76	13.28	11.86	3.38	S(P < .01)

Note : School 1 is W.P.L. School, Bangalore and School 2 is Bapu Primary School, Harohalli.

The table data indicates that students of women's peace league could not get significant gains in ratings, that is, the changes in behaviour were not sufficient to get higher ratings. The students of Bapu Primary schools and when all the students are taken together, they could get sufficient gains, probably because of the perceptible changes in their behaviour. This inference gets additional weight because of the complementary results in the first table.

#### 4.3.7 Analysis of Qualitative Data

The opinions of children given in the reaction questionnaire were consolidated. Most of the students ( approximately 85% ) were of the opinion that the stories and components were interesting and they had liked solving puzzles, riddles, writing stories, poems, etc. There was general approval of the verbal creativity instructional materials by the children , who were the consumers. It was interesting to note that 97% of the children had expressed that the story was interesting and in one chapter 95% of the children had opined that it was fun to solve the problems.

The enjoyment of the children in solving problems and writing the stories, etc., was felt by the investigator himself during the administration of these materials. The motivation was so high that children had the perseverance to sit at home and solve it themselves, at any cost. Occasional feedback by one or two parents could be cited here as evidence for this.

The children had also suggested that some of the puzzles, riddles, etc., were difficult. The head masters of both the schools were good enough to interview some of the students informally and provide a feedback to the investigator, regarding the difficulty of some puzzles,

riddles, etc. As a result of this, the number of puzzles, riddles, etc., were reduced. But these changes did not affect the reasonable nature of the instructional materials, and more over the changes made were minimum. The number of puzzles, riddles, etc. that remained were, 10 consequences situations, 26 puzzles, 39 riddles, 10 divergent problems, 10 mystery plots, 24 stories/ideas for stories, 26 poems/ideas for poems and 36 riddles/ideas for riddles.

The suggestions of children written in different parts of reaction questionnaire were consolidated. Suitable decisions were taken to modify the verbal creativity instructional materials. The rural-urban differences with regard to the suggestions were considered and equal importance were given to both. This helped in keeping the types of puzzles, riddles, etc., and their numbers balanced between the two groups. The sex differences with respect to suggestions given were not considered, as the statistical analysis indicated no difference between sexes before and after the treatment.

By the personal experience of administering the instructional materials, feedback by the students, teachers and headmasters, it was inferred that the verbal creativity instructional materials were found suitable to the said class,

viz., VI standard. The results of the statistical analysis very well imply that verbal creativity instructional materials do foster creative abilities of VI standard children. The English version of the final form with all the modifications incorporated, has been presented in Appendix Q

4.3.8 An Overview of Formative Evaluation : Formative evaluation started from the very initial steps of developing the instructional materials to pilot study, passing through various stages. These can be found from section 4.2.1 to section 4.3.7.

Formative evaluation started in all probabilities from the inception of the idea of developing instructional materials as the investigator went on examining the structure and details from the point of view of their suitability to the target population; viz., the age of the children, educational status, pedagogic considerations, etc.

In the beginning when the stories were being written, the investigator got a reference, viz. Torrance (1964), which fitted into the 'Scheme of the Study' and therefore it was incorporated. The reference by Torrance, indicated that just by giving information about creative people, creative process and the like, results in significant creative growth

not ordinarily achieved. An introductory chapter was added to the scheme of materials explaining simple creative products, creative process, etc.

The suitability of approach, instruments etc., can be looked into at this stage of evaluation, which will be presented in the following paragraphs.

The Passi tests of creativity were found suitable by norms development study ( Vide section 4.2.3 ). As these tests were to be used in the pre-test and post-tests of both the pilot study and the validation study, separate norms were developed for Kannada speaking children of standard VI in and around Bangalore.

The creativity rating scale was developed on the lines of Foster (1971). The same dimensions, viz., fluency, flexibility, originality, elaboration and inquisitiveness had been used by Torrance (1962) for a different purpose. The teachers were oriented in using this scale in the orientation programmes conducted for them. The teachers who used them in the pilot study stage were satisfied with regard to its rationale and procedure of use and therefore no modifications were made to use it in the validation study.

The reaction questionnaire used at the pilot study stage was a long one with many questions. The purpose of constructing

such a reaction questionnaire was to collect the opinions of students on various aspects of each of the chapters of verbal creativity instructional materials. The purpose of using a reaction questionnaire at the validation study stage was to collect the opinions of the students on likeability of stories and components, etc., for validation and therefore, a simple and small one was constructed so that the children of std. VI could respond adequately and effectively. Some of the questions of the earlier reaction questionnaire were retained. As the emphasis was not on modifying the instructional materials, this small one was considered fit for the validation purpose.

#### 4.4.0 Summative Evaluation

The formative evaluation of the verbal creativity instructional materials was explained in the preceding sections. The summative evaluation will be explained in this section, in terms of student's and parents' views, teacher ratings and creativity tests. The tools for investigation which were used to find out the suitability of instructional materials, were either constructed or selected. A reaction questionnaire and two interview schedules one for the children and one for the parents were constructed. A socio-economic status scale and a comprehension test in Kannada were selected. (Vide p. 138 )

Validation Study : Through summative evaluation the overall workability of the instructional materials will be judged. All these aspects have been reported as the sections of validation study, from 4.4.1 to section 4.4.7.

#### 4.4.1 Instrumentation

Reaction Questionnaire : A reaction questionnaire with a few items mainly to get the opinions of the children was constructed. The previous reaction questionnaire was a long one, as the purpose was to collect the opinions to modify the instructional materials. The emphasis here, was to use it only as a validating instrument. Most of the questions were of Yes or No type, with content being the likeability of stories and the components. In each chapter, a question regarding the difficulties faced while solving the component, was also added. The Kannada version of this was given to working teachers, so as to get the feedback regarding the functional use of words, phrases, etc. The English version of the final form can be found in Appendix H.

Interview Schedules : (i) An interview schedule to collect the opinions of high and low gainers was constructed. The high and low gainers were those with respect to their creativity scores from pre-test to post-test. Questions regarding their interest in the instructional materials, their new hobbies, and

to know the types of thinking they indulge in, etc., were put. The Kannada version was looked into by the practising teacher educators regarding its suitability to the said sample. The English version can be found in Appendix M.

(ii) An interview schedule for parents of these high and low gainers was prepared to know the changes in behaviour of these children at home, during the experimentation. The aim was also to find differences, if any, in the family environment of such children and the way they are treated at home. The questions were on the behaviour of children at home, the types of work they do at home, the way the parents think about their children, etc. The Kannada version was again looked into by the teacher educators and their suggestions were incorporated in the final form. The English version of the final form can be found in Appendix N

The Socio-Economic Status Scale : 'A common socio-economic status scale for rural and urban areas' constructed and standardized by Aaron, et al. (1969) was selected for the purpose of the present study. The purpose was to find out the socio-economic status of the students and in turn, whether it would have any effect on the fostering of their creative abilities, as evidenced by the increase in creativity test scores. The main points for its selection were : (i) it was developed in Kannada on Karnataka sample;

(ii) it was a common scale for rural and urban areas;  
 (iii) the reliability of the scale was 0.77 ( $P < .01$ ) and validity (concurrent) was 0.61 ( $P < .01$ ) which were very high and could be used with confidence; (iv) the raw SES scores could be converted to  $T$  scores easily with the help of the table given in the scale manual; and (v) the cutting points for division of SES into low, middle and high, etc., were provided in the manual itself. The English version of the SES scale can be found in Appendix I

The Comprehension Test in Kannada : The comprehension test for VI standard children in Kannada was selected from among the series of comprehension tests developed by Dave, et al (1974), at Regional College of Education, Mysore. The purpose was to find out the correlation of this test with the initial creativity test scores and to know the relationship that exists between the two. The salient points for selecting this test were : (i) the comprehension test was developed in Bangalore region; (ii) the scoring of the test was very easy because of the multiple choice test items; (iii) the test was used extensively by researchers and teachers in the State of Karnataka; and (iv) the test was accompanied by a teachers manual which provides detailed guidelines for administration. (Appendix J )

#### 4.4.2 Selection of Schools

The selection of two schools in urban area ( one experimental and one control ), and two schools in rural area ( one experimental and one control ) was done on the basis of the achievement of children in the standard V final examination. The data regarding the achievement in terms of marks were collected in Jayanagar zone in Bangalore and Bangalore south rural area. The investigator visited all the 20 schools in both urban and rural areas (10 in each area ) and collected the marks of the standard VI children in the month of May, 1980. The children had just entered the standard VI and their standard V marks were collected.

The means were found out separately for urban and rural areas. The schools which were near around the mean were selected for experimental treatment. The schools in urban areas were Vijaya Middle school and M.E.S. higher primary school. The schools in the rural area were Government Model Primary School, Byramangala and Government Model Primary School, Kaggalipura. By the toss of a coin, one in each area was selected for experimentation, the remaining one was considered as the control group. The schools selected for experimentation were, M.E.S. higher primary school in urban area and Government Model Primary School, Kaggalipura in rural area. The remaining two schools formed the control groups.

The two urban schools were private schools run by private managements, but getting the aid from the Government of Karnataka. The distance between the two schools was 2 kilometres, but situated in the same extension, viz., Jayanagar in the southern part of Bangalore.

Both the rural schools were Government Model Primary Schools, directly under the Assistant Educational Officers. The distance between the two schools was 21 kilometres, situated in and around Bangalore, Kanakapura road.

The investigator with his regular visits was able to find out that the cultural and social conditions of both the urban schools and both the rural schools were similar. The urban schools have head masters, who have been working for 10 years in the same schools. The rural schools being the government schools had head masters who were often transferred to other places. In the rural experimental school even though the head master was transferred within the period of experimentation, it did not affect the experimentation in any way. The Assistant head master was in charge of experimentation in the school. He and the head-master of urban experimental school provided good co-operation and facilities that were necessary during the experimentation. The teachers also evinced keen interest in the experiment and promised their co-operation during the experiment, in the

first meeting held by the investigator in both the schools.

#### 4.4.3 Pre-test

The investigator administered verbal tests of creativity by Passi, to VI standard children both boys and girls, at Government Model Primary School, Kaggalipura on 3-6-1980, on the subsequent day, viz., 4-6-1980, the same students were administered the comprehension test by Dave, et al. (1974) and socio-economic scale by Aaron, et al (1969).

The investigator administered verbal tests of creativity by Passi; to VI standard 'B' section children both boys and girls, at M.E.S. higher primary school, Jayanagar, Bangalore on 5-6-1980. On the subsequent day, that is, 6-6-1980, the same students were administered the comprehension test and socio-economic status scale. On 7-6-1980, the teachers who were handling VI standard in both the experimental schools were called to participate in an orientation programme organized in R.V. Teachers College, Bangalore. The investigator followed the same procedure, that he had followed during the 'Orientation programme' for pilot study ( Appendix G. ).

The administration of verbal tests of creativity in

control schools was postponed due to various reasons. It could not be held immediately after the pre-testing was over in experimental schools. The car festival in Byramangala, was the reason for closure of the school for three days. The verbal tests of creativity were administered to the VI standard children, both boys and girls of Government Model Primary school, Byramangala on 11-6-1980.

Paucity of rooms and delay in construction of new rooms in Vijaya Middle School, that is the urban control school, made the investigator wait upto 17-6-1980. Only on 17th, he was able to administer verbal tests of creativity, to VI standard children, both boys and girls in that school.

The comprehension test and socio-economic status scales were not administered in the control schools. The date wise programme has been given in Appendix K.

The teachers of both the experimental schools observed the children, keeping the dimensions of creativity in mind and rated them on the creativity rating scales provided to them. As they had been oriented in the orientation programme they did not have much difficulty

in rating the children. The teachers of urban school were given roll numbers of children in such a way that after rating once, each student would get two ratings.

Ex. : Teacher A would rate roll numbers from 1 to 20, Teachers B would rate roll numbers from 11 to 30 ... and so on.

In the urban experimental school all the children got two ratings before the start of the experiment. But in the rural experimental school all the children could get only one rating because of paucity of teachers, as they were either transferred or they went on deputation. The teachers who were not handling VI standard were not requested to rate the children, as they did not have the opportunity of observing them inside the classroom.

#### 4.4.4 Administration of Verbal Creativity Instructional Materials

The treatment was first started on 9-6-1980 in M.E.S. Higher Primary School, Jayanagar, Bangalore, as the authorities agreed to provide one period each on Mondays, Tuesdays and Wednesdays, mostly in the afternoons during the first half of the experiment and in the mornings during the second half.

The treatment in the rural school, viz., Government Model Primary School, Kaggalipura was started on 12-6-1980, as the authorities agreed to give one period each on remaining three days of the week mostly in the mornings during the first half and in the afternoons during the second half of the experiment.

On the first day in both the schools, a requisition letter was handed over to each child, to be given to his/her parents after writing the father's or mother's name over it. The purpose of giving this letter was to request the parents, not to give the answers of the puzzles, riddles, etc., when asked by the child, but to encourage him/her to think more and solve themselves ( Appendix L ) .

The cyclostyled copies of the first chapter were distributed among the students and was read by the investigator. They were told about the postures of different poets and scientists, and were allowed freedom to sit in any way they like and think. The simple creative products, the creative processes, etc., were explained. They were informed as to what was expected of them during these periods. They were encouraged to ask questions. As the chapter was an informative one, some comprehension questions were put to the pupils, at the end of the chapter.

From chapter two to chapter nine, same procedure was followed in both the schools. The investigator after distributing the cyclostyled copies among the students, read the first half of the story, and curiosity of the children was aroused. The most frequent questions were 'What happened to Manju and Kamali?', 'How did they come back alive?' etc. They were impressed that for Manju and Kamali to come out or escape. They have to help by solving puzzles, riddles etc. The characteristics of the input, which were common in both the rural and urban experimental schools were : (i) curiosity was aroused by reading the first half of the story; (ii) the puzzles, riddles, etc., were solved by the students at their own pace, as each had a copy for himself; (iii) positive reinforcements were given by the investigator. The negative reinforcements were avoided, but the children were told that there could be other ways of thinking when the answer was wrong; (iv) even partial thinking towards the answer was identified and reinforced; (v) an atmosphere of freedom was maintained by the investigator in all the periods, which the children liked and enjoyed; (vi) if, in case of many children not able to arrive at the answer, hints or clues were provided by the investigator, but not the answer; (vii) individual attention was given by the investigator. He would sit with the child having trouble and encourage the child to think more

and in different ways; (viii) the original and clever answers were put on the black board by the investigator, as a form of reinforcement; (ix) the children who had finished a problem were allowed to go to the next problem ; (x) in any case, the children had to show the answer to the investigator and not to say the answer loudly. This was because, when an answer was announced by a student, the others would stop thinking and accept that as the answer, whereas if they think on their own, many might be able to arrive at their own responses; (xi) the same sequence in terms of problems to be solved in the class, the problems to be taken for homework, etc., was followed in both the experimental schools; and (xii) after all the problems had been solved, then only the investigator was distributing the latter half of the story, to quench their desire to know what happened to Manju and Kamali.

The entire treatment took 40 periods per school or 13 weeks in both the schools. The investigator enjoyed working with the children and it was a common sight to see the children surrounding him after the class hours. The investigator was happy that some children went beyond him in thinking novel answers. The children enjoyed the programme and sometimes it was difficult for the investigator to control them in the class, like, when they got a new answer, their 'hurrahs', surrounding him to show their answers first, etc. There was no

problem of indiscipline and the school authorities were also happy about it.

The reaction questionnaire was administered after every two chapters were over, and in the case of ninth chapter, after that itself. As in the pilot study, the investigator did not know the names of the children, but was able to recognize them by face only.

#### 4.4.5 Post Test

The teachers of both the schools again observed the same students and rated them on the creativity rating scale. Urban teachers gave two ratings for each child, whereas the rural teachers gave only one rating per student because of paucity of staff.

The investigator administered the Passi tests of Creativity, ( the same four tests ) to standard VI children of urban experimental group that is M.E.S. Higher primary school on 4-9-1980, as the post-test.

The Passi tests of Creativity were administered to standard VI children of rural experimental group, that is, Government Model Primary School, Kaggalipura on 8-9-1980, as the post-test.

The post-tests in case of control groups were administered exactly 3 months after. The rural control group, that is, Government Primary School children took the same tests of Creativity on 11-9-1980.

The urban control group, that is, Vijaya Middle school children took the same tests of creativity on 17-9-1980.

#### 4-4-6 Scoring of the Tests

The scoring of the pre-test and post-test booklets was done after the completion of the experiment, meticulously following the test manual. This was done intentionally by the investigator, the reason being that the high scores or low scores on pre-test on the part of a student might bias the investigator. Not knowing who is high or who is low facilitates the investigator in giving equal treatment to all the children during the experiment.

#### 4.4.7 Mode of Analysis

The pre-test and post-test scores were subjected to descriptive statistics for both the schools together (Appendix P). The pre-test scores of urban experimental school and rural experimental school were separately treated for finding first ( $Q_1$ ) and third ( $Q_3$ ) quartiles. The high creative potential students were those who had scored above  $Q_3$ . The low creative potential students were those who scored

below  $Q_1$ . Those students who fell inbetween  $Q_3$  and  $Q_1$  were considered as students with middle creative potential. The point of great importance has been the initial difference between the schools in the pre-test scores. A casual look at the table 15.1 reveals this nonequivalence between experimental schools and their corresponding control schools.

The socio-economic status scales were scored giving weightage according to the manual developed by the original investigators. The total of weightages for each student was called the raw SES score. The raw scores were then converted into 'T' scores separately for rural and urban categories, as per the conversion table given in the manual, with Mean, = 50, and S.D. = 10.

The 'T' scores were used for deciding whether the student belonged to high SES or low SES categories. The students having 'T' scores <sup>above</sup> Mean + 1.5 S.D., were considered as high SES students. The students with 'T' scores below mean - 1.5 S.D., were considered as low SES students. Those students who had 'T' scores in between  $M \pm 1.5$  S.D., were considered as middle SES students.

The sex of the students and whether they belonged to the rural or urban areas were available on the first page of their answer booklets. The data having sex, creative potential, SES

and rural urban background variables, were tabulated and accordingly analysed in the next chapter.

The reaction questionnaires completed by the students were analysed and tabulated. It was interesting to note that 90% of the children liked the stories except in one or two cases, where percentages were slightly low. The students upto 90% had liked the solving of problems, writing of stories, etc.

The creativity rating scales completed by the teachers of both the schools were scored by adding the ratings of various dimensions. In case of urban school, the sum of two summated ratings was considered as the score, in case of rural schools, the summated rating itself was considered as the score. The data regarding the creativity ratings of post and pre - experiment times were tabulated to find out significant differences, if any.

The creativity scores of post-test and pre-test were tabulated in front of each name and the gains were computed. The top gainers and low gainers were separately taken from urban experimental school and rural experimental school ( Appendix O ). 12 students from both the schools, that is, 3 top and 3 low gainers in each, were interviewed by the investigator using the interview schedule prepared by him. The

interviews were conducted in an informal way and the rapport was built before the questions were put. The data gathered from top gainers and low gainers were tabulated separately for rural and urban schools.

The parents of these top gainers and low gainers were also interviewed by the investigator using the separate interview schedule developed for that purpose. The parents were interviewed in an informal way, after the rapport was built. All the parents were very cooperative as the children had taken the instructional materials home and in some homes had created sensation by their unusual and original answers. The rural parents also volunteered information, because the regular visits of the investigator had been marked by them. All the parents felt enthused about the investigator's work that some such project was taken up in the schools where their children were studying. The parents of low gainers were given some suggestions for their children's improvement also. The data gathered from the rural and urban parents were separately tabulated. Names of those parents interviewed can be found in Appendix O.

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