

CHAPTER III

METHODOLOGY

3.0.0 Introduction

The present investigation is on development of verbal creativity instructional materials and experimentally validating them against some criteria like, abilities of students, backgrounds of students, teacher ratings, etc. The objectives of the study have been put forth in Chapter I. The outline of different steps which were followed in conducting this project is given in this chapter. Two major aspects of the study are formative evaluation and summative evaluation. A standardized test, viz., the Passi tests of Creativity, had to be utilised to measure the creativity of children at pilot study and validation study stages. As the test had to be used on a new population, the need to develop new norms for that population was thought necessary. Therefore, Norms development study also became a part of the methodology followed. Different methodological steps in the form of a flow chart has been presented at the end of ^{fourth} ~~this~~ chapter (Vide p. |38).

3.1.0 Norms Development Study

In order to realise objective 1 (Chapter I, p.29) the suitability of Passi tests of Creativity on sixth standard children of Bangalore district, Karnataka was found out. The tests (both verbal and non-verbal) were originally developed in Hindi and English for students of IX, X and XI standards, belonging to Punjab, Haryana and Union territory of Chandigarh. As the present investigation required verbal tests only, for sixth standard children, that too of Kannada speaking boys and girls of Bangalore district, Karnataka, it was thought necessary to develop new norms for the tests. The same tests were used for pilot study and validation study.

3.1.1 Sample

The sample comprised 570 students of standard VI, both boys and girls of 15 schools of Bangalore district, Karnataka. The 15 schools, 5 in each of three educational districts, were selected giving proportional weightage to the number and types of schools as well as geographical representation.

3.1.2 Procedure

Passi tests of Creativity comprise six tests, three verbal, two non-verbal and one with nonverbal stimuli but

verbal responses. Four of the tests, three verbal tests and one with nonverbal stimuli with verbal responses were selected, as the instructional materials that would be developed would only be in verbal form. The four tests, viz., Seeing Problem Test, Unusual Uses Test, Consequences Test and Test of Inquisitiveness, were translated into Kannada. The Kannada version was looked into by teacher educators and experts in Kannada language and culture, and one change in the example was brought about in Consequences test, but the test-items remained the same. As the children of standard VI would not be fluent and fast in writing, as their counterparts in secondary/higher secondary schools, the time per test was increased to one and a half times. The tests with increased time duration were administered by the investigator himself in all the schools.

3.1.3 Descriptive Statistics

The answer scripts were scored by the investigator carefully following the test manual. The descriptive statistics like, mean, standard deviation, kurtosis and skewness were worked out. Reliability coefficients worked out by the split-half method, were comparable to original tests. Decile norms, sexwise and residencewise were also computed. These four tests were used in the pre-test and

post-test of both the pilot study and the validation study.

3.2.0 Development of Verbal Creativity Instructional Materials

The detailed procedure of development of instructional materials with theoretical assumptions, the characteristics of instructional materials, etc. have been explained in Chapter IV. In the process of their development the instructional materials were subjected to formative evaluation in order to realise the second objective of the study.

3.2.1 The Formative Evaluation

'The curriculum builder, when he proceeds to construct the new material, he is constantly evaluating his own material as better than that which is already current. Unless entirely ignorant of one's shortcomings as a judge of one's own work, he is also presumably engaged in field testing the work while it is being developed, and in doing so, he gets feedback on the basis of which he produces revisions; he is usually involved with colleagues, ex:- classroom teachers or peers, who comment on the material as they see it again, this evaluation produces changes ; this is of course formative evaluation.' (Scriven, 1967).

Scriven described formative evaluation as evaluation used to improve a curriculum during its development, which permits intelligent changes to be made in the curriculum.

The formative evaluation in the process of developing the instructional materials under this study, consisted of finding the content validity by expert's opinion, finding the suitability of words and phrases of the verbal creativity instructional materials. The pilot study was also the part and parcel of formative evaluation. The detailed picture of each of these stages is presented below.

3.2.2 Finding The Content Validity of Instructional Materials

The main purpose of developing instructional materials was to foster creative abilities of VI standard children. Certain components like puzzles, riddles etc. were presented in the middle of the stories, so that the creative abilities of children come into play. There were nine parts in the instructional materials, the first part being purely an informative one on creative persons, creative process, etc., and what the children are expected to do. The remaining eight parts had adventurous, fantasy stories, at strategies points of which, the puzzles, riddles, etc., were introduced.

The typed copies of the first draft of the verbal creativity instructional materials were given to experts and

their opinions were sought on a reaction questionnaire. As the instructional materials were meant to be used by the primary children, four primary teachers and two primary teacher educators were consulted. Two secondary teacher educators were consulted, who went through the whole of instructional materials from the view point of educational psychology. Two curriculum experts from D.S.E.R.T. also gave their opinions.

A reaction questionnaire consisting of 21 questions on 9 chapters or parts (Vide Appendix B) was used to collect the opinions. Each question had part a and part b, part a being a closed end question and part b, an open-ended question. Additional sheets were provided to facilitate writing of detailed comments.

3.2.3 Finding the Suitability of Words and Phrases

After incorporating the suggestions given by experts in the preceding stage, the modified version was given to children to go through the entire instructional material and underline the difficult words and phrases.

The purposive sample for this purpose consisted of 3 standard VI children, one from rural area, one from urban area and one who had migrated to urban area six months back. The purpose behind the selection of these typical children was

that the instructional materials were to be administered on rural and urban samples. Bangalore is a city where many children migrate because of their parents' transfers or jobs, and therefore, one such child was also requested to help in the study.

Many underlined words and phrases were replaced by simple ones. The rural child's and the migrated child's underlinings were given more prominence, as the purpose was to make the instructional materials easily comprehensible by rural and urban children alike.

3.3.0 Pilot Study

A pilot study is generally a miniature of some part of the actual study in which the intended instrument / instructional material is administered to subjects drawn from the same target population. It may be designed to provide a trial run of the data - collection approach, data-collection method or instrument, data analysis techniques, handling of the instruments by subjects, to provide training to investigators, etc.

The critical outcome of pilot study is the researcher's knowledge that everything works. The approach, method and instrument are appropriate for his sample, yield reliable and

valid data which he can analyse to test the hypotheses, and thus, hopefully answer the research questions (Fox, 1969). In the present investigation, pilot study was undertaken with a sample of students, to whom the cyclostyled copies of the verbal creativity instructional materials were administered.

3.3.1 Design of the Pilot Study

The design of the study was of single group pre-test post-test type, which has been~~sc~~ schematically presented here. 'R' represents the mean creativity score of the group in the schematic presentation.

	<u>Pre-test</u>	<u>Post-test</u>
Urban school	R_1	R_2
Rural school	R_3	R_4

The differences in R_2 and R_1 and R_4 and R_3 were to be taken as indicators of effectiveness of verbal creativity instructional materials.

3.3.2 Sample

The sample for experimentation consisted of 51 students (21 boys and 30 girls) of Women's Peace League Primary School, Basavanagudi, Bangalore and 36 students (25 boys and 11 girls) of Bapu higher primary school, Harohalli, Kanakapura, Tq. Bangalore

district. As it was not possible to randomly select the children, the whole sections were taken for the experiment.

3.3.3 Tools Used

Various tools were used to collect the data, so that suitability of verbal creativity instructional materials could be found out and additional changes could be incorporated.

(i) Creativity Test : The Passi tests of Creativity which were found suitable by the 'Norms Development Study' explained in section 4.2.0 were used as pre-test and post-test.

(ii) Creativity Rating Scale : A Creativity Rating Scale on the lines of Foster (1971) was developed. The teachers of both the schools had to observe the children, keeping in mind the dimensions of creativity explained in non-technical terms. The rating was to be done by teachers on a 5 point scale before and after the pilot study.

(iii) Reaction Questionnaire : A Reaction Questionnaire for the students having 73 questions on all the 9 chapters of the instructional materials was developed. Some questions were of open type, soliciting the opinion of students freely. Parts of the reaction questionnaire were answered by the students after the concerned chapters were completed by them.

3.3.4 Experimental Procedure

The students of both the schools were provided the cyclostyled copies of verbal creativity instructional materials sheet by sheet. Sufficient space was left in the cyclostyled copies for students to work out puzzles, write stories, etc. The investigator read the first half of the story and motivated the students. The children then had to solve the puzzles, riddles, etc. Only after they solved all the puzzles, riddles etc., the second half of the story was read to them. Permissive, free climate was maintained in all the periods. Before and after the administration of these materials, Passi tests of Creativity were administered as pre-test and post-test. The children were rated by their teachers on creativity rating scale, before and after the administration of instructional materials. The children also answered parts of the reaction questionnaire by giving their free and frank opinions about the instructional materials.

3.3.5 Analysis of Data

The obtained data were analysed both quantitatively and qualitatively, depending upon their nature. 't' tests for correlated means and independent means were used to find the significance of difference between means of creativity scores of children in pre-test and post-test. 't' test for correlated

means was used to analyse the creativity rating data. The responses of children on the reaction questionnaire were consolidated chapterwise and qualitatively analysed. The important suggestions were incorporated in the instructional materials.

After the formative evaluation, the final draft of the verbal creativity instructional materials were ready for validation study to realise the third objective (Chapter I, p 30).

3.4.0 The Summative Evaluation

Summative evaluation is the final evaluation of an activity or instructional material or the process of teaching. At this stage of evaluation an effort is made to obtain some kind of terminal or overall evaluation so that some type of general conclusion can be arrived at. It also means that using some criteria, the investigator tries to look back or looks over the whole process in order to find out the impact that has been produced.

The summative evaluation in this study, i.e., validation study, consisted of administering the verbal creativity instructional materials in urban and rural schools, having corresponding control schools. The independent variable was the instructional materials and the dependent variable was the

gains in the creativity scores. It seems that the effect of verbal creativity instructional materials may be influenced by variables like sex, socio-economic status, creative potential of students and their rural-urban backgrounds and therefore these have been termed as moderator or secondary independent variables.

3.4.1 Design of the Validation Study

The design of the summative evaluation could be schematically represented as follows. 'R' here, represents the mean creativity score of the group.

	<u>Pre-test (PTC)</u>		<u>Post-test (PTC)</u>
Urban Experimental School	R_1		R_2
Control school	R'_1		R'_2
Rural Experimental School	R_3		R_4
Control school	R'_3		R'_4
Urban	$(R_2 - R_1) - (R'_2 - R'_1) = X$		
Rural	$(R_4 - R_3) - (R'_4 - R'_3) = Y$		

The differences in gains, X and Y were to be taken as indicators of the effectiveness of verbal creativity instructional materials.

In case of a developmental cum experimental study like the present one, more emphasis could be placed on $(R_2 - R_1)$ and $(R_4 - R_3)$, with respect to many variables, that have been considered. In a developmental study it is more important to find the initial and final levels of the students.†

3.4.2 Sample

The sample for the summative evaluation consisted of 46 students of urban experimental school, 37 students of rural experimental school, 39 students of urban control school and 27 students of rural control schools, totally, 83 from experimental schools and 66 from control schools. As randomisation was not possible whole classes were taken for experiment.

A set of 12 students was again selected at the end of the experiment. After the post-test was over, the differences in pre-test and post-test scores of all the students of experimental schools were computed. 3 top gainers from each of rural and urban experimental schools and 3 low gainers each from rural and urban experimental schools were selected for interviewing. The parents of these students were also interviewed.

3.4.3 Tools Used

(i) Creativity Tests : The same four tests of Passi tests of Creativity were used as pre-test and post-test in the summative

evaluation also, in all the four schools. Q_3 and Q_1 were used to divide the experimental children into high, middle and low creatives.

(ii) Creativity Rating Scale : The same creativity rating scale was used by the teachers to rate the students before and after the experiment in the experimental schools.

(iii) Socio-economic Status Scale : A common socio-economic status scale for students of rural and urban areas developed by Aaron, et al. (1969) was selected to assess the socio-economic status of experimental students. The scale provided cutting points for dividing the students into high, middle and low SES groups, which were used by the investigator in the analysis.

(iv) Comprehension Test in Kannada : A comprehension test for VI standard children developed by Dave, et al. (1974) was selected to assess the comprehension ability of the students in the experimental schools. As the verbal creativity instructional materials had to be read and comprehended by students, this test was used to measure the ability and to know the extent of its influence on creativity fostering, in the present study.

(v) Reaction Questionnaire : A simple reaction questionnaire with 46 questions on various chapters was developed. As the

purpose was only to validate the instructional materials and not to modify the same, a smaller one was constructed. The questions were mainly on likeability of the story, the component and the difficulties faced, with respect to each component.

(vi) Interview Schedule for Students : An interview schedule for high and low gainers in the creativity tests, with 21 questions was developed. The emphasis of the questions was mainly on the encouragement they got in the family, the way they felt when gave unusual answers, the way they think, etc. The purpose of this schedule was to find the differences, if any, between high gainers and low gainers.

(vii) Interview Schedule for Parents : An interview schedule for the parents of high and low gainers with 19 questions was constructed. The emphasis was on their opinion of the programme that went on in their ward's school, the way they treated their children, the changes in the behaviour of their children, what type of encouragement they give their children, etc. The purpose here also was to find the differences in family backgrounds of the high and low gainers.

3.4.4 Experimental Procedure

The final form of the verbal creativity instructional materials were given to experimental students to solve the

problems, write the stories, etc., after they were motivated by reading the first half of the story. The detailed procedures and classroom situational characteristics have been discussed in chapter V. The children were encouraged to think and reinforced suitably, so that they could do well. They were given the latter half of the story, after they completed the solving of puzzles, riddles, writing of poems, stories, etc. The students were pre-tested and post-tested on Passi tests of Creativity. They were rated by their teachers before and after the experiment. The students also completed parts of reaction questionnaire after every two chapters were over. The experimental schools children were also administered socio-economic scale and comprehension tests. Their counterparts, viz., the control schools children took only Passi tests of Creativity as pre-test and post-test.

3.4.5 Analysis of Data

The data were analysed quantitatively and qualitatively. In quantitative analysis of data the distributions of obtained data, necessitated the use of both parametric and non-parametric techniques for groups which were 8 and above. 't' test for correlated means and Wilcoxon test were used to find the significance of difference between means of correlated samples. 't' test for independent means and Mann-Whitney U

test were used to find the significance of difference between means of independent samples. Product-moment 'r' was calculated to find the relationship between comprehension test scores and pre-test creativity scores, separately for two schools and together also. Analysis of Covariance was run to know whether the experimental school children have done significantly better than control group children taking into consideration their pre-test scores. 't' test for correlated means and Wilcoxon test were used to find the significance of difference between means of pre-ratings and post-ratings, which the students got. The qualitative data had to be pursued in case of opinions. The opinions of children given in the reaction questionnaire were consolidated and percentages were computed. Their difficulties were qualitatively analysed. The interview data of the high gainers and low gainers and their parents were tabulated groupwise and qualitatively analysed to arrive at certain inferences.
