

CHAPTER III

METHODOLOGY

In order to achieve the objectives of the present study, which have already been detailed in Chapter I, it is necessary to look at certain methodological requirements which would help to arrive at reliable and valid conclusions. The design of the study, the sample selected, tools employed in the study and procedure of data collection are described below.

Research Design

The pre-test, post-test control group design was employed in the study. This design employs one or more experimental treatment groups and a control group. All the groups are tested before the treatment, and after the treatment on criterion variables. The significance of the differences on criterion variables under different treatments can be studied in two ways: (1) the gains or differences in the pre and post scores on different variables of the experimental group(s) are compared with the gains or differences obtained in the control group. The procedure thus gives the effectiveness of the treatment(s) in relation to control group; and in the event of two or more treatments, their relative effectiveness is also assessed; (2) the experimental group(s) and the control group are compared on the post-test scores after adjusting for the

initial differences in the pre-test scores. If the experimental group(s) scores are significantly different from those of the control group, the difference is attributed to the treatment condition. In this study the second method has been used, the reasons for which are given in the chapter on analysis.

In this study three groups of children were involved: two experimental groups and one control group. In the two experimental groups, two treatments were administered.

Treatment I: Under treatment I children were exposed to educational television programmes without intervention programmes. These children viewed the programmes in the school. Though the teacher was present, he did not interact with children in any activity related to educational television programme. His role was limited to switching on the television set before the programme and switching off the television set after the programme.

Treatment II: Under treatment II, children were exposed to educational television programmes alongwith intervention programmes, that is, pre and post-telecast discussion and activities on the educational television programmes with children. For this purpose brief notes on educational television programmes for the guidance

of teachers were supplied to them, giving a short outline of the programme, its objectives, as also the method of conducting pre-telecast and post-telecast discussions and activities with children on television programmes. These notes were intended to facilitate the teacher's task in the conduct of pre-telecast and post-telecast discussions and activities. These notes assisted the teacher in motivating and mentally preparing the children or improving their receptivity to the programme. These notes also helped the teacher enabling him to strengthen and enrich the information, values, skills etc., conveyed in the programme by post-telecast discussions. Details of the intervention programmes are given under Instrumentation.

There were thus three groups in the study: (1) experimental treatment group I, that is, ETV group without intervention; (2) experimental treatment group II, that is, ETV group with intervention and; (3) control group, that is Non-ETV group.

The pre-test post-test control group design adopted in the study provides for control of some of the variables which jeopardise internal validity of the experiment (Campbell and Stanley, 1963). Intersession history is controlled in so far as the general historical events that might have produced differences during the

period between pre-test and post-test measurement in the control group, would produce differences in the experimental group as well. Maturation and testing are controlled in so far as they should be manifested equally in the experimental and control groups. Instrumentation is controlled through reliability of the tools used in the experiment. Selection is controlled to the extent the randomization assures equality of the groups. Sex of the students, grade and subjects* learned by them were held constant. Other variables such as management, type of school, qualifications of teachers etc. were controlled by selecting a sample from amongst the primary schools for girls under the Municipal Corporation of Delhi. This should result in consistency of influence of these variations at school stage. A significant variable, viz. intelligence of the children in the sample was planned to be controlled statistically at analysis stage.

The sampling procedure followed in selecting the three groups of children is described in the following section.

Sample

The primary schools for girls under the Municipal

*Some schools offer General Science and some schools offer Home Science in class V.

Corporation of Delhi formed the universe in this study. The sub populations were formed out of this universe: the schools with ETV and schools without ETV. As two treatments were administered in this study, the sub population of schools with ETV was further divided into two groups, the ETV group without intervention and ETV group with intervention. The students from Non-ETV sub population served as a control group. Details of the procedure adopted for the selection of schools is given below:

Selection of Schools:

For making a systematic selection of schools for the study, a list of Municipal Corporation Primary Schools of Delhi with TV and without TV was obtained from the Education Department of the Municipal Corporation of Delhi. In 1978, when this study was undertaken, there were 1450 primary schools under Municipal Corporation of Delhi. Of these, only 155 schools, in ten zones, were provided with TV sets. Schools with TV sets were generally those which had pucca building and which catered to children of families with no facility for TV viewing.

As the purpose of this study was to find out the effectiveness of ETV on the educational development of primary school children, it was necessary to conduct study in those schools where most of the ETV programmes were

shown to the children and where TV sets were maintained and serviced efficiently, that is, got repaired quickly in case of any breakdown. For this purpose a questionnaire was administered to all the schools provided with TV sets to obtain information on utilization of ETV programmes and maintenance of TV sets in the schools. Additional information was also collected through this questionnaire regarding the number of shifts and the school timings in summer and winter. This information was to be utilised for school visits and mailing of notes on ETV programmes for guidance of teachers for intervention programmes. The questionnaire used in the study was based on an earlier study* related to utilisation and comprehensibility of school television programmes in Delhi. The questionnaire used in this study is given in Appendix I.

Information gathered on the maintenance and utilisation of TV sets revealed that out of 155 schools which were provided with TV sets, only 45 schools had shown most of the ETV programmes to children and the time taken for repair of TV sets in these schools ranged from 7 to 14 days. These 45 schools with TV sets formed the sub population of schools with TV and 12 schools were drawn randomly from this sub population to form two

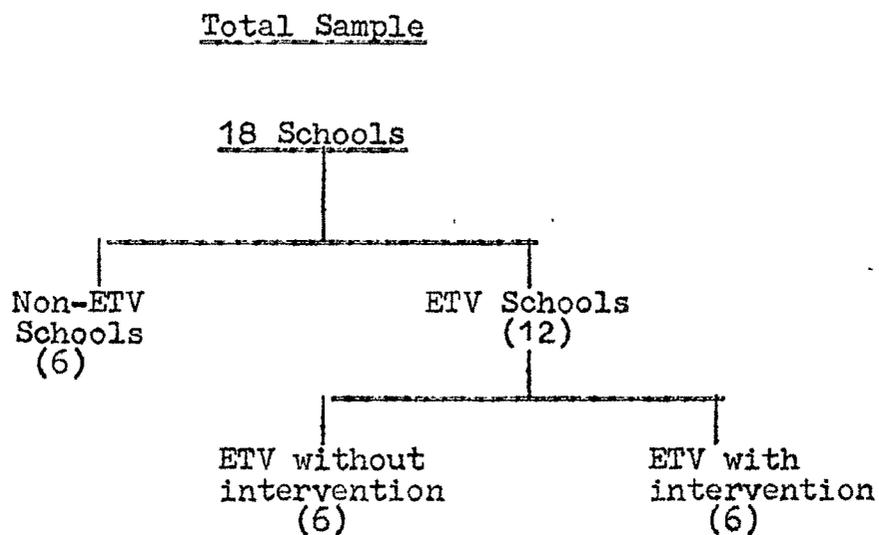
*This study reported by Phutela in 1980, was conducted in 1977-78.

experimental groups. These 12 schools were further divided randomly to form experimental group I (with six schools) where ETV programmes were shown without any intervention, and experimental group II (six schools) where, in addition to showing ETV programmes, the pre and post-telecast discussions and activities were conducted by the teacher to strengthen the ETV programmes. In other words, experimental group II involved teacher intervention in the form of pre and post-telecast discussions and activities.

For a selection of a comparable group of control schools, where TV sets were not provided, assistance was sought from the Education Department, Municipal Corporation of Delhi. The concerned Education officers were given the list of 12 experimental schools and were requested to suggest six schools without TV which had (a) pucca building, (b) which cater to children of families where most of them do not have facility for TV viewing at home (c) where qualifications and experience of teachers were similar to those teaching in 12 schools selected for the two experimental groups, and (d) where performance of children was similar to those studying in 12 schools selected for the experiment. Keeping in view the above criteria, 20 schools were listed which were considered by the officers of Education Department

as comparable to experimental schools. Out of these 20 schools, six schools were drawn randomly to form the control group of schools.

In all, 18 schools were included in the study, the list of which is given in Appendix 2. Of these six schools formed experimental group I (ETV without intervention), another six schools formed experimental group II (ETV with intervention), and the remaining six formed the control group (where TV sets were not provided). The sample of schools for the study was distributed as follows:



The average experience of teachers in each of the three groups was 14, 13.5 and 14.3 years respectively.

The children in all the three groups generally belonged to similar economic strata. It may be pointed out that Municipal Corporation Schools in Delhi primarily cater to lower economic strata and under privileged communities.

The ETV programmes of Delhi Doordarshan for primary classes are generally compact programmes and they do not specify the precise age group or class for which the programmes are meant. But after consultations with the teachers of schools having TV sets, the study was confined to class V children as most of the ETV programmes for primary classes were deemed to be more suitable for class V children. In each school, children of only one section of class V were taken for the study. Wherever there were more than one section in class V, the section selected for the study was taken up randomly. For the third objective of the study, in order to provide feedback to administrators and producers on different aspects of educational television programmes, 12 teachers of schools under two experimental groups formed the sample.

The total number of children in three groups in respect of whom the complete pre and post-data was available was 447. Of these, 149 were in ETV group with

intervention programmes, 153 in ETV group and 145 in Non ETV group.

Instrumentation

For measurement of certain variables included in the study, some of the instruments developed by other researchers in the field were used, some were adapted and some were developed by the investigator. The instruments used in the study were:

1. Intelligence test.
2. Tests for language development viz., word meaning, verbal fluency, listening comprehension and reading comprehension.
3. Achievement tests in three school subjects namely, science social studies and Hindi.
4. Test based on ETV programmes.
5. A proforma for getting the information about the qualifications and experience of teachers teaching class V children.
6. Interview schedule to get the feedback from teachers regarding different aspects of ETV programmes for primary classes.
7. Guidance notes for intervention programmes.

The literature of educational research related to educational television was examined. A study of literature revealed that whereas the intelligence test as well as instruments for language development were available and were found to be suitable for the study,

other instruments had to be prepared for the study by the investigator.

Details regarding the procedures followed in preparing adapting/adopting the instruments are presented in the section to follow.

Intelligence Test

To find out the level of intelligence of children in three groups, a reliable and valid measure of intelligence was needed. As the sample consisted of class V children, it was decided to use a non-verbal test of intelligence. The Raven's Coloured Progressive Matrices was considered suitable for this purpose. This test is particularly useful as a screening device for groups where estimates of level of intelligence are required to be determined (Bortner, 1965).

The Raven's Coloured Progressive Matrices is a non-verbal test comprising of sets A, Ab, B. It is designed to measure Spearman's 'G' factor. This test has been widely used with children in India (Kalra 1978, Rao 1982, Kanade 1982). According to Raven (1965):

The three sets A, Ab, B of twelve problems constituting the coloured matrices are arranged to assess the chief cognitive process of which children under 11 years of age are usually capable. The three sets together provide three opportunities for a person to develop a consistent theme of thought,

and the scale of thirty-six problems as a whole is designed to assess as accurately as possible, mental development upto intellectual maturity.

In each problem, the six figures from which a selection has to be made are chosen so that a person can easily find the correct piece if he knows, what he is looking for. To ensure sustained interest, the figures in each problem are boldly printed on brightly coloured background. The order of the problems in each set provides the standard training in the method of working, and the three sets together are arranged to cover all the perceptual reasoning process of which children under 12 years of age are usually capable.

Since the content is limited to highly abstract material which is largely foreign either to the classroom or to every day experience it is highly probable that the test relates more directly to 'native' abstract intelligence and less to academic achievement; educational opportunity or cultural background than is the case with most tests of general intelligence (Shipley, 1960).

In appraising the Progressive Matrices it seems well to emphasize three points. In the first place the Progressive Matrices are one of the few or relatively few new tests that have come from psychological laboratories in the last fifteen years.... The second important point is that the matrices do seem to be excellent test of intelligence The last point is that the progressive matrices present what may be called the first comprehensive attempt to measure intelligence in terms of a single intellectual function, to wit that of visual perception (Wechsler, 1960).

The re-test reliability of test as mentioned by Raven is 0.80. Raven's Progressive Matrices Test developed in U.K. is one of the tests which has been very widely used all over India. Sinha (1968) made an attempt to collect data from investigators using the Progressive Matrices Test in different parts of India. On the basis of the data regarding the reliability of the Coloured Progressive Matrices, she reports:

Hazeni (1960), who investigated the stability of coloured Matrices for children between 9 and 12 has not reported the figure for reliability. But considering that the mean remained practically the same even after a lapse of six months, one can expect the reliability coefficient which, calculated from Srivastava's data (N. 258), worked out to be 0.959. This speaks highly of the test in this regard.

Tests for Language Development

Tools were needed for measuring different aspects of language, such as, word meaning, verbal fluency, listening comprehension and reading comprehension. For measuring these aspects tools were available. However, for measuring word meaning and verbal fluency, tests were used without any modification whereas for listening comprehension and reading comprehension, the tests were slightly modified.

The description of these tools, procedures,

followed in their adaption/adoption is presented below.

Word Meaning.

Nature and content: The word meaning test attempts to measure the grasp of meaning of words within the expected passive vocabulary of children of class V. This is an objective type test having 40 multiple-choice items. A stimulus word is given and against each word five alternative meanings are given. The child is asked to underline the nearest synonym from the given alternatives for the word to be tested. As the alternatives are close in meaning, a child has to show his discriminating capacity in choosing the right alternative. In this test all the items carry one mark each.

Development of the test: The test was administered in NCERT-ISRO (National Council of Educational Research and Training - Indian Space Research Organisation) Project "SITE Impact Study for Children (1977)" on class V children, in three Hindi speaking states, namely, Bihar, Madhya Pradesh and Rajasthan. As SITE was conducted in villages, the tests developed for the SITE study were primarily meant for rural population. The sample for SITE consisted of both boys and girls. The psychometric properties of the test were also not available. To ensure the suitability of test for the

present study which was conducted on urban population, the tryout for the test was carried out on 100 girl students of class V of three Delhi Municipal Corporation Primary Schools for girls. Care was taken to include only those schools for the tryout study which were comparable to the sample of schools taken up for the actual study. Here it may be mentioned that the tryout for all the tests used in the study was carried out on the same 100 students.

The results of the tryout were analysed. Difficulty value and discrimination indices were computed for each item in the test. The difficulty of an item was determined by the number of examinees in the group who got the item right. The discrimination value of an item was determined by the extent to which the given item discriminates among examinees who differ sharply on the function measured by the test as a whole. For determining the discrimination value for an item, biserial correlation was used. Biserial 'r' gives the correlation of an item with total score on the test. For determining the discrimination indices, the number who answered the item correctly in selected upper (27 percent) and lower (27 percent) subgroup was found. Next the discriminating power of an item - its consistency with the total score was gauged by the correlation

of the item and the whole test. The biserial 'r' was read from Flanagan's Table. Items in the difficulty range between 19 percent to 78 percent and discrimination range between 0.33 to 0.76 were included in the test. A majority of the items were, however, within the range of 20 percent to 70 percent for difficulty and 0.41 to 0.70 for the discrimination. The difficulty value and discrimination value for all the items is given in Appendix 3.

Reliability of the test: For computing the reliability coefficient of a test, split-half technique was used in this investigation. The test was divided into two equivalent 'halves' (odd and even split) and the correlation found for these half tests. From the reliability of the half-test, the self correlation of the whole test was then estimated by the Spearman Brown Prophecy formula. The split-half reliability of the word meaning test was 0.84 and for the whole test was 0.91 (N=100).

Validity of the test: The validity of the test was inferred from the correlation obtained between an item and total score on the test. These correlations were read from the Flanagan's Chart. The correlations were in the range of 0.33 to 0.76.

As may be seen from the results of tryout, there was no need for any modification. So it was administered without any change in the present investigation. The test and its scoring key are given in Appendices 4 and 5 respectively.

Verbal Fluency

Nature and content: This test aims at judging the ability of children to associate as many words as possible which are relevant to the key word. There are five items in the test. The children were asked to provide as many words as they could think of in response to a given stimulus word. The five stimulus words were so chosen as to be familiar to them in their environment. This test does not aim at measuring so much expressive power as the richness of vocabulary which can be recalled around a central concept.

Development of the test: The test was developed for NCERT-ISRO Project "SITE-Impact Study on Children, 1977". For the reasons mentioned in the word meaning test, this test was also administered to the selected tryout sample of 100 girl-students of Municipal Corporation schools of Delhi. The results of the tryout were analysed. The difficulty value of the test items was not calculated because in this test it is the number of

words which a child can associate around a concept word, which matters. The more the number of words he can associate, the more marks he gets. For every word one mark was given. The range of average number of words for five concept words was five to eight. Discrimination value was computed for each item which are given in Appendix 6.

Reliability of the test: The split-half reliability of the test was 0.77 and for the whole test 0.86 (N-100)

Validity of the test: The validity of the test was inferred from the correlations obtained between an item and total score on the test. The correlations for these items were in the range of 0.40 to 0.53. The test is given in Appendix 7.

Listening Comprehension

Nature and content: The test aims at measuring the following abilities in children:

- to recall the content of the story after hearing it only once,
- to remember the sequence of events,
- to understand the relationship between events and
- to draw conclusions.

A short story or a paragraph was read out to the children once and some questions based on the story/ paragraph were asked. The children were asked to write the answers in the answer sheet given to them. In all, four stories were read out one by one. For each story, five questions were asked. In this test all the items carry one mark each.

Development of the test: This test included four stories. Three of them were taken from the listening comprehension test used in the SITE Impact Study on Children (1977), and one story was taken afresh. Care was taken to see that all the four stories had adequate potentiality to reflect various aspects of listening comprehension ability. Other considerations which determined the inclusion of the stories for the tryout study were that the stories should not be known to children and should be within the comprehension level and ability of children.

As regards, the content of the paragraphs/ stories, the first story was about a cat and children; the second was an anecdote from the life of Gandhiji; the third about the childhood of an eminent scientist Dr. Jagdish Chandra Basu and the last one was an episode about Akbar, a Brahmin and Birbal.

The results of tryout revealed that the range of difficulty value of items in the test was 22 to 78 percent and the range of discrimination indices of items 0.38 to 0.69. The difficulty value and discrimination value for each item are given in Appendix 8.

Reliability: The split half reliability of the test was 0.80 and for the whole test 0.89.

Validity: The validity of the test was inferred from the correlations obtained between an item and total score on the test. As may be seen from the results of tryout the test was a reliable and a valid measure. The modified form of the test and scoring key are given in Appendices 9 and 10 respectively.

Reading Comprehension

Nature and content: The test aims at measuring the following abilities in children after reading a passage:

- understanding of the meaning of words, phrases and sentences in a given context,
- finding the main idea ,
- finding the specific details ,
- understanding the sequence of ideas ,
- sorting irrelevant from the relevant matter,
- making relationships of the cause and effect,
- predicting outcomes of what is read.

In this test four passages were given. The first passage was woven around the theme of a football match. The second passage was about a hardworking farmer, the third about means of transportation and the last one was a fable. Children were asked to read each passage and answer objective type questions given at the end of each passage.

Development of the test: This test, originally developed by Gupta (1967), was adapted to suit the purpose of the study. Gupta tried out the test only in two zones in south Delhi and the sample consisted of boys as well as girls. To find out the suitability of the test for the present study, this test was administered to a selected tryout sample of 100 girls students of class V, of Delhi Municipal Corporation Schools. The results of the tryout were analysed. Difficulty value and discrimination indices were computed for each item and are given in Appendix 11. On the basis of the results of analysis, four items having difficulty value of 8 percent, 8 percent, 12 percent and 6 percent ; and with low or no discrimination index (0, 0.16, 0.28 and 0) were not retained in the final form of the test. In the original test there were 34 items and in its adapted form only 30 items were retained. Each item in the test carried one score.

Reliability of the test: The reliability of the test as quoted by Gupta was 0.74. The split-half reliability of the adapted test was 0.86 and with correction for the whole test 0.92.

Validity of the test: The validity of the test was inferred from the correlations obtained between an item and total score on the test. The correlations were in the range of 0.34 to 0.65.

As may be seen from the result of the tryout, the test was a reliable and valid measure. The final form of the test and the scoring key are given in Appendices 12 and 13 respectively.

Tests of Achievement

It was decided to test achievement in three school subjects, namely, Mother Tongue, General Science and Social Studies. Here it may be mentioned that the titles and specific content for all the programmes to be telecast for primary school children during the academic year under study, were not decided in the beginning of the year. The planning of ETV programmes for primary classes was done for one month at a time and usually the programmes were recorded 10 to 15 days in advance only. As the titles and the details of the programme to be telecast during the year were not available in the

beginning of the year, it was decided to develop these tests on general themes provided to ETV producers for developing the programmes. These tests were developed by the investigator and tried out on the same sample mentioned earlier before administering them for the main study.

Achievement Test in Science

Nature and content: The test in science was designed to measure the important outcomes of instructions at the end of the primary school stage. This was meant for class V children.

Development of the test: This test was constructed and validated according to the normal procedure of achievement test construction. The procedure followed in selecting content of the test to measure the important outcomes, consisted of:

- determining the objectives to be measured,
- determining the proper emphasis and weightages to be assigned to various objectives,
- deciding upon the format of test items and,
- developing test items.

The items were constructed only after a thorough analysis of instructional materials viz., syllabus developed by National Council of Educational Research and Training and; syllabus, textbooks and teacher guides in

use in Delhi Municipal Corporation Primary Schools. There were nine units in syllabus and all the nine units were covered in the test.

As far as format of questions is concerned, only objective type questions were given. All the questions in this test were of multiple choice type, requiring the pupils to choose and check the correct answer out of the four alternatives printed for each item of the test.

Initially, 30 items were developed with the help of content specialists, and discussed with teachers, measurement experts, school inspectors, officers of the State Institute of Education and lecturers of Teacher's Training College. On the basis of their suggestions, the items were modified. The test was then administered to a tryout sample of 100 girls studying in class V in Delhi Municipal Corporation Schools.

The results of the tryout study were analysed. Difficulty and discrimination indices were computed for each item of the test. Difficulty value and discrimination indices for each item are given in Appendix 14.

In selecting the material for the final form of the test, consideration was given not only to the statistical evidence of suitable difficulty and discrimination power but also to the construction of a test

which would correspond to a balanced coverage of objectives. If the number of items were less in a particular area, the items with marginal variations in the criteria of discrimination index and difficulty value were selected.

The teachers, content specialists and measurement experts were asked to scrutinise the test particularly with respect to coverage of topics, clarity of questions, difficulty of materials, adequacy of direction etc. Thus, in effect, the test was subjected to the critical review of many experts and teachers, and their suggestions and criticism were taken into account in developing the final form of the test. In the final form of the test, there were 25 items. All the items carried one mark each.

Reliability of the test: The split-half reliability of the test was 0.85 and with correction for the whole test 0.92 (N=100).

Validity of the test: Two types of validity were considered. The content validity was determined through expert judgement and the internal validity of the test was inferred from the correlations obtained between an item and total score on the test. The correlations were in the range of 0.40 to 0.62.

The final form of the test and its scoring key are given in Appendices 15 and 16 respectively.

Achievement Test in Social Studies

Nature and content: The achievement test in social studies has been developed to measure the extent to which the children of class V have achieved the objectives of teaching social studies to class V.

Development of the test: In the development of achievement test in social studies, the procedure followed was the same as in the case of achievement test in science. In social studies, the main units of syllabus were five and all units were covered in the test. In this test, most of the questions were of multiple choice type. Only the last question required the students to locate and fill in the names of certain countries and oceans, etc. in the map of the world.

In this test, initially there were 35 items. On the basis of the results of the analysis of the tryout 30 items were selected for the final form of the test. The difficulty value and discrimination indices for each item are given in Appendix 17. In this test also each item carried one score.

Reliability of the test: The split-half reliability of the test was 0.86 and with correction for the

whole test was 0.92 (N-100).

Validity of the test: Two types of validity were considered. Content validity was determined through expert judgement. The internal validity of the test was inferred from the correlations obtained between an item and total score on the test. The correlations were in the range of 0.38 to 0.69. The final form of the test and its scoring key are given in Appendices 18 and 19 respectively.

Achievement Test in Language (Hindi)

Nature and content: In this test an attempt has been made to measure the different language skills in children of class V. This test was based on the syllabus and textbooks in Hindi for the children of class V. To make the test objective and precise, only those aspects of language skills were selected that could be tested through specific answers. In this test, three aspects of language, namely, form, grammar and meaning were taken into account.

Development of the test: In the development of this test, the procedure followed was the same as the one adopted for the science test. There were 14 questions in this test and under each question, there were five to eight items. The questions were given on the following:

1. Gender
2. Opposites
3. Synonyms
4. One word for several
5. 'Sandhi'
6. Spelling
7. Adjective
8. Simile
9. Idioms
10. Classification
11. Use of appropriate words
12. Conjunctions
13. Derivations of words
14. Drawing conclusion

The test consisted of objective type questions, namely, multiple choice questions and very short answer (one-word) questions.

In this test initially there were 85 items under 14 questions. The test was administered to the selected tryout sample of 100 girls students of class V. The difficulty value and discrimination index for each item were computed. The difficulty value and the discrimination value for each item are given in Appendix 20. On the basis of difficulty value and discrimination value of items, the test was finalised. In the final

form of the test, there were 75 items under 14 questions.

Reliability of the test: The split-half reliability of the test was 0.84 and with correction for the whole test 0.91 (N-100).

Validity of the test: Two types of validity were considered. Content validity was determined through expert judgement. The internal validity of the test was inferred from the correlation obtained between an item and total score on the test. The correlations were in the range of 0.36 to 0.68.

The final form of the test and the scoring key are given in Appendicis 21 and 22 respectively.

Test based on ETV Programmes

Nature and content: The test attempts to measure the information acquired by children through different ETV programmes telecast during the year 1978-79 by Delhi Doordarshan for primary classes.

Development of the test: The test was developed on the basis of Primary School television programmes telecast during the year of study, that is 1978-79. All the programmes were seen by the investigator and a test was prepared to find out the difference among the three groups of children on acquisition of information

related to ETV programmes. Initially, 47 items were prepared for the test. The test was discussed with measurement experts and teachers of class V. They were asked to review the test, and give their comments particularly with respect to coverage of ETV programmes, clarity of questions, suitability of the items for the grade level (class V), adequacy of direction, etc. Thus, in effect, the test was subjected to the critical review of experts and teachers, and their suggestions were taken into consideration in modifying the test.

The test was administered to the same tryout sample of 100 girls studying in class V in Delhi Municipal Corporation Schools. On the basis of the results of the analysis of tryout, 40 items were selected for the final form of the test. The difficulty value and discrimination indices for each item are given in Appendix 23.

Reliability of the test: The split-half reliability of the test was found to be 0.93 and with correction 0.96 (N=100).

Validity of the test: Two types of validity were considered. Content validity was determined through expert judgement. The internal validity of the test was inferred from the correlations obtained between an

item and total score on the test. The correlations were in range of 0.36 to 0.76. Hence the test was considered a valid measure.

The final form of the test and its scoring key are given in Appendices 24 and 25 respectively.

Proforma for Teachers

Teacher is an important factor in the educational development of a child. The teaching experience and educational qualifications of teacher are related to his teaching performance, which in turn affects students' learning. Therefore, it was decided to obtain information from the teachers on these two aspects. A proforma was prepared to get the information regarding the length of service/total teaching experience as well as the qualifications of teachers teaching class V in the 18 schools included in the study. The investigator personally got this proforma filled by the teachers. The proforma is given in Appendix 26.

Interview Schedule

Purpose: The purpose of interviewing teachers of ETV schools was to find out their opinion about ETV programmes for primary classes during the year of study on the following points:

- the programmes liked most by children and the reasons for liking those programmes,

- the programmes not liked by children and the reasons for not liking the programmes,
- suitability of the programmes for class V children with respect to (i) content (ii) language and (iii) presentation of the programme,
- subjects on which they would like to have ETV programmes,
- difficulty in showing the ETV programmes and
- their suggestions for increasing the effectiveness of programme and also for the repair of TV sets.

For the teachers of experimental group II schools, that is, ETV group with intervention, additional questions were included in the interview schedule. As stated earlier, in experimental group II (ETV group with intervention programmes), ETV programmes were strengthened by intervention programmes. The teachers in these schools were sent notes on ETV programmes. These notes on ETV programmes contained, the objectives of the programme, content of the programme and guidelines as to how they should conduct pre-telecast as well as post-telecast discussions and activities with the children. These teachers were asked some additional questions on notes, such as, whether they received the notes in time, quality of notes and suggestions for improvement of notes on ETV programmes.

Development of interview schedule: On the basis of observations made during the various stages of data collection, the interview schedule was prepared and

discussed with teachers and media experts. After incorporating their suggestions, the tryout was done to remove ambiguity, if any in the questions, to find out the time required for holding the interview, and to know the extent of cooperation got from the teacher. The tryout was done on teachers of two Delhi Municipal Corporation Primary Schools for Girls having TV sets. These schools were other than the 12 schools with TV sets, included in the study. In these schools most of the ETV programmes had been shown to children. The interviews in these schools were recorded. Then the recordings of the interviews were played back among a small group of measurement experts, social scientists and media experts. On the basis of their comments and investigator's own experience of the tryout, the interview schedule was modified. After tryout it was found that the time required for interviewing one teacher was about 50 minutes.

The interview schedule was in a semi-structured form. In brief, 14 questions were included in interview schedule for two experimental groups, that is, ETV group without intervention and ETV group with intervention programmes. To the teachers of experimental group II additional six questions were asked on notes sent to them by the investigator. The interview schedule is given in Appendix 27.

Guidance Notes for Intervention Programmes

One of the objectives of the present investigation was to study the effectiveness of ETV programmes along with intervention programmes on the educational development of primary schools children. The purpose of intervention programmes was to increase the effectiveness of ETV programmes by their proper utilisation at the receiving end. For the proper conduct of intervention programmes, notes on all ETV programmes to be telecast during the year of study, were developed by the investigator for the guidance of teachers of experimental treatment group II schools.

To develop notes on ETV programmes for teachers and to send these notes well in advance to them, it was necessary for the investigator to preview ETV programmes at least 10 to 15 days before the actual telecast. Hence, at the outset, the investigator discussed the plan of study with Director, Delhi Doordarshan and Producer, ETV programmers for primary classes. They agreed to extend the cooperation and to provide necessary facilities for previewing the ETV programmes or to see the recordings of ETV programmes in the studio's of Delhi Doordarshan.

As already stated earlier, the package of ETV programmes for the full academic year was not available in the beginning of year. Planning of programmes to be

telecast was done for one month at a time and usually a programme was recorded 10 to 15 days before the actual telecast. As majority of the programmes were not recorded far in advance, it was decided to develop notes for each programme separately, that is, single programme guide, which is a complete teacher's guide for each telecast.

For preparing notes on ETV programmes for the guidance of teachers, the following basic axioms given by Diamond (1964) were kept in mind:

1. The guide should be brief, concise, and clear. Classroom teachers do not have time to wade through reams of paper.
2. A check should be made to ensure that everything of importance is included. The teaching guide, that is, notes on ETV programmes serve as the main contact between television teacher and classroom teacher and it is extremely important for the success of any TV programme.
3. The guide/notes on ETV programmes must be done in time and should be in teacher's hand well in advance before the actual presentation of the programme.
4. Programme must be known before the guide/notes are written.

Before the experiment started, the producer ETV programmes for primary classes was requested to send a copy of the titles of the ETV programmes to be telecast every month to the investigator during the period of

experiment, that is, one academic year. On the receipt of the list of programmes, the investigator contacted the Producer, Primary School ETV programmes to find out as to when the video tape recording or the actual recording of the programme could be seen. The investigator saw the video tape recordings or actual recordings of the programmes in the studio's of Delhi Doordarshan and took the audio recordings of the programme. The guidance notes were prepared for the individual programme with the help of content specialists. The notes included title of the programme, day and date of the telecast, objectives of the programme, summary of the programme, pre-telecast activities and post-telecast activities. In pre-telecast activities, they were given suggestions as to how to motivate the children and make them ready for the telecast. The post-telecast activities included questions to be asked for reinforcement as well as for clarification of certain points. Some additional information related to the programme and suggestions for the organisation of follow up activities for the programme were also given in post-telecast activities. Copies of the notes on ETV programmes sent to teachers are given in Appendix 28.

Data Collection and Treatment

After the selection of schools for the study, the

permission for conducting the study in these schools was obtained from the Education Department of Municipal Corporation, Delhi. The Headmistresses of these 18 schools selected for the study were acquainted with the study and they agreed to extend every possible help and full cooperation for conducting the study.

Collection of information about teachers: The proforma for teachers was filled by the teachers teaching class V in these 18 schools to find out their qualifications and experience and it was found that the average experience of teachers in each of the three groups was 14, 13.5 and 14.3 years respectively. Qualification-wise also all the teachers had the basic training in teaching as per the requirements laid down by the Education Department of Municipal Corporation of Delhi.

Pre-testing of children: Raven's coloured Progressive Matrices test was administered to class V children in all the 18 schools selected for the study, in the beginning of first term in the year 1978-79, to find out the level of intelligence of children in the three groups. It was administered to children in a group of not more than 20 at a time. The instructions given to children regarding this test are given in Appendix 29.

Here it may be mentioned that except for intelligence test for which data was collected in the beginning

of the experiment, and ETV programme based test which was administered at the end of experiment only, for all other variables data were collected before as well as after the experiment.

The following tests (pre-tests) were administered to class V children in the 18 schools in the beginning of first term in 1978. The average time taken by the children for a test is given against each test.

Test	Time
1. Word Meaning	30 minutes
2. Verbal Fluency	35 minutes
3. Listening Comprehension	50 minutes
4. Reading Comprehension	50 minutes
5. Achievement test in Science	25 minutes
6. Achievement test in Social Studies	30 minutes
7. Achievement test in Hindi	1 hour

A uniform testing procedure was adopted in both the experimental and control schools. The test was administered under classroom situation available in Indian schools. Children were seated in such a way that no two children could see each other's responses. The class teacher remained in class throughout the test to maintain the necessary seriousness among children, and to maintain normal discipline.

Instructions for each test were given separately. Children were asked to write their names, roll numbers, name of the school and date, etc. on the paper/answer sheet. The instructions on how to answer the questions were given on the paper/answer sheet. As the sample of the study consisted of class V children, instructions were given to them in simple language.

Treatments

The experiment involved two treatments. The treatments consisted of exposure of children of experimental group I to ETV programmes and exposure of ETV programmes along with intervention programmes to children of experimental group II for six months. The ETV programmes were telecast twice a week on Monday and Thursday by Delhi Doordarshan. The teachers of 12 experimental schools were requested to show the ETV programmes to children of class V on both the days of the week, when the programmes were telecast. This was considered necessary because as per instruction of Science Branch, Municipal Corporation of Delhi, the schools were showing ETV programmes to children of classes II and III on Mondays and to children of classes IV and V on Thursdays. They were also requested to make the physical arrangements which are necessary, such as, to see that children are comfortably seated and they can view the

television properly, to adjust the room and television set before the telecast begins, to see that the room is well ventilated, the picture is in sharp focus and the volume is correct.

The teachers of experimental treatment group I, that is ETV group without intervention were given only these two instructions, (a) to show ETV programmes to children of class V on both the days of the week and (b) to make necessary physical arrangements. In other words, in these schools, nothing was done by way of pre-telecast and post-telecast discussions and activities. The role of teacher was to switch on the TV set before the telecast and switch off the TV set after the telecast was over.

As stated earlier, the experimental treatment II consisted of exposure of children to ETV programmes along with intervention programmes, that is, pre and post-telecast discussion and activities. The teachers of schools under experimental treatment group II were given brief training by the investigator, the details of which are given in the section to follow.

Before initiating the experiment, it was considered necessary to orient the teachers of experimental treatment group II schools, that is, ETV group with intervention programmes in organizing intervention

programmes, so as to increase the effectiveness of ETV programmes for children. For this purpose a brief training programme for the orientation of teachers was organized by the investigator in one of the Municipal Corporation School for girls in Delhi with TV. The investigator explained to the teachers the purpose of the training, the importance of intervention programmes and also how to conduct pre-telecast activities and post-telecast activities. The instructions relating to intervention programmes given to teachers were as follows:

Before the telecast:

1. Check the notes on ETV programme for content and objectives about the specific telecast your class would be viewing.
2. Include some type of pre-telecast/introductory activities for the children in your class so that they are motivated and prepared to view the ETV programme. Be sure that they know what to look for, rather than what to look at.
3. Make the physical arrangements which are necessary. See that children are comfortably seated and they can view the television properly. Adjust your room and television set before the telecast begins. See that the room is well ventilated, the picture is sharp and clear and the volume is correct.
4. Place yourself where you can observe both the telecast and the reactions of your students.

After the telecast:

1. Discuss important aspects of the telecast

and clarify anything which may not be clear to the students.

2. The follow up activities suggested in the notes are an integral part of the whole programme and your class should participate in those activities.

All the teachers of the group were given a copy of guidance notes for the ETV programme to be telecast for primary classes on that day. The training programme was organized on the day when there was a telecast for primary classes. They were asked to go through the notes on ETV programme carefully and ask for clarification, if any. Then, before the telecast the investigator conducted pre-telecast activities with children. After the telecast post-telecast activities were conducted with children. The teachers were told that they would be receiving guidance notes for each of the ETV programmes to be telecast for primary classes. They were requested to organize pre-telecast activities before the programme and post-telecast activities after the programme for all ETV programmes.

During the treatment which continued for about six months, guidance notes for every programme were prepared by investigator with the help of content specialist and were mailed to teachers of experimental group II schools well in advance.

Throughout the experiment, on the day of telecast, the researcher visited one of the experimental schools without giving them any prior intimation to find out if the guidance notes sent by her were being used by the teacher. Thus, every school under Experimental group II, that is, ETV with intervention programmes was visited about eight times by the researcher during the period of treatment. This provides evidence about the treatment fidelity. Since there was no idea to link any specific effect to any particular programme, the entire treatment was taken as a package. The treatment was received in a group situation.

During all this time the control group received no treatment, that is children of this group did not see ETV programmes in school. This group continued with instruction as usual without any exposure to ETV programmes.

Interview with teachers: At the end of third term, teachers of both the experimental groups, that is, ETV group without intervention and ETV group with intervention were interviewed to get feedback from them regarding the different aspects of ETV programmes. As the investigator visited ETV schools many times throughout the year, she had established rapport with the teachers in these schools. The investigator explained

to them the purpose of interview and told them that their interviews will be recorded. As mentioned earlier, it was semi-structured interview. The written schedule provided plan for interview, so that all important aspects were covered.

After conducting interviews in all 12 experimental schools, the interviews were transcribed by the investigator and the responses of the teachers were classified. The details of their responses are given in next chapter.

Post-testing of children: The ETV programmes were telecast by the Delhi Doordarshan upto 15th March, 1979. At the conclusion of the experiment, the following eight post-tests were administered to all the students in 18 schools under three groups:

1. Word Meaning
2. Verbal fluency
3. Listening Comprehension
4. Reading Comprehension
5. Achievement in Science
6. Achievement in Social Studies
7. Achievement in Hindi
8. ETV programme based test.

Data scoring and processing: Each item in a question paper carried one mark each. Correct answer was assigned a score of 1 and for wrong answer a score of 0 was given. A copy of the key used for scoring the tests, namely, word meaning, listening comprehension, reading comprehension, science, social studies, language achievement and test based on ETV programmes are given in Appendices 5, 10, 13, 16, 19, 22 and 25 respectively.

Here it may be pointed out that in language development battery, there were four tests and language development score was derived by summing the score on word meaning, verbal fluency, listening comprehension and reading comprehension.

At the end of the experiment, data on the following variables were available for all the children in the three groups:

1. Intelligence
2. Word Meaning
3. Verbal Fluency
4. Listening Comprehension
5. Reading Comprehension
6. Language development
7. Achievement in Science
8. Achievement in Social Studies

9. Achievement in Hindi
10. Test based on ETV programmes.

The data collected were scored and tabulated for computer processing. The details regarding the statistical analysis of data are given in the chapter to follow.