CHAPTER III

METHODOLOGY

In this chapter the methodology used in the study
has been discussed. The design of the study and the
sample is given in one section. The section on research
tools gives the description and details of the various
measuring instruments. In the last two sections, the
treatment and data collection procedure is reported.

Design and Sample

Three basic experimental designs were considered
for adoption. These were: (1) Pretest-Posttest Control
Group Design, (2) The Solomon's Four-Group Design, and
(3) The Posttest - Only Control Group Design (Campbell
and Stanley, 1964). The first design requires the test-
ing of the experimental and control group at two stages,
before and after the treatment. The second design
involves working with four samples, two experimental
and two control. Of these, one experimental and one
control group is tested before the treatment and all
the groups are tested after the treatment. Both these
designs have a pre-test component.

In the above two designs pre-testing would have

to be carried out prior to the treatment. This would

mean pre-test at grade three, and after two years, post-

test at grade five. Apart from the administering tests

to such lower age group, it would require suitable tools

with adequate reliability and validity for this age

group. Since the intervening period between the pre-

test and the post-test would be too long, children's

maturation, as also other unknown factors may come into

operation. The stability of the obtained measures, over

the two year period, would become questionable. There-

fore, any design that would rely on pre-testing would

not suit the present study.

The pre-testing is not actually essential to the

true experimental design. The post-test - only control

group design incorporates an experimental and control

group to which the subjects are randomly assigned. The

experimental group receives the treatment and then both

the groups are measured on the selected variables.

If the experimental group scores are significantly

different from those of the control group, the

difference is attributed to the treatment condition.

The post-test - only control group design does

not rely on pre-testing but emphasises the randomi-

zation without pre-test as the most adequate all

purpose assurance of the lack of initial biases

between the groups. In the present study this design
was followed.

Two stage sampling procedure was adopted. The
first stage was related to the selection of schools,
and the second stage was related to the selection of
students within each of the selected schools. Two
considerations determined the population of schools.
Firstly, only the Delhi Municipal Corporation's elemen-
tary schools were taken into account. These schools
cover the largest elementary school going rural popula-
tion in the Union Territory. All these schools being
under one management are fairly uniform with respect to
the equipment, building and other facilities. The
schools are served by a single cadre of teachers and
they all follow a common curriculum. Secondly, only
boys schools were included. These two restrictions were
imposed to make the school population more homogeneous.

The population of the Union Territory is served
by over one thousand five hundred elementary schools
under the administration of the Delhi Municipal Corpo-
ration. The territory is divided into ten educational
zones. While the zones covering the city proper are
totally urban, those at the outskirts cover rural
population. There are four predominantly rural zones.

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The corporation has provided television sets in 186 schools. Of these, about one-third are located in the rural areas. This study was undertaken with reference to these rural television schools of the Union Territory.

To select schools with television for experimental (or treatment) group; and schools without television for control group, two things were kept in view. One was to ensure that the selected experimental schools actually received the treatment, that is, the television exposure adequately. This meant that the television was in working order for most of the time under consideration, and that the television programmes were shown to the children. The other point related to the selection of control schools, which should be properly matched with the treatment schools, on all aspects other than the television viewing facilities.

The above sampling requirements were fulfilled with the assistance of the inspectors of schools of the rural zones who were aware of the existing conditions in the rural schools. Their judgement was considered reliable and crucial in identifying such schools for sampling purpose. With this end in view, the Directorate of Education, Delhi Municipal Corporation was

approached. Through the Directorate, the inspectors of schools at the zonal level were contacted.

The purpose of the study was explained to the inspectors of schools and they were requested to help in identifying those schools where the television was functioning properly, not only during the current session, but also during the two preceding ones. They were requested to base their judgement on their personal observations in schools,as also on school reports.

The inspectors were also asked to identify an equal number of schools without television in the nearby areas. These were to serve as control schools. While selecting schools, they were requested to ensure that the non-television schools were similar to the selected television schools, particularly with respect to the school's general academic achievement, standing in non-curricular activities and level of teaching. Matching the schools on these criteria was an important control applied to ensure constancy of influence at the school stage.

Following the above procedure, a total of 23 television and 23 non-television schools from all the four zones were listed. These two lists were considered

MAP OF
UNION TERRITORY
OF DELHI

UTTAR
PRADESH

HARYANA

RURAL
AREA

URBAN
AREA
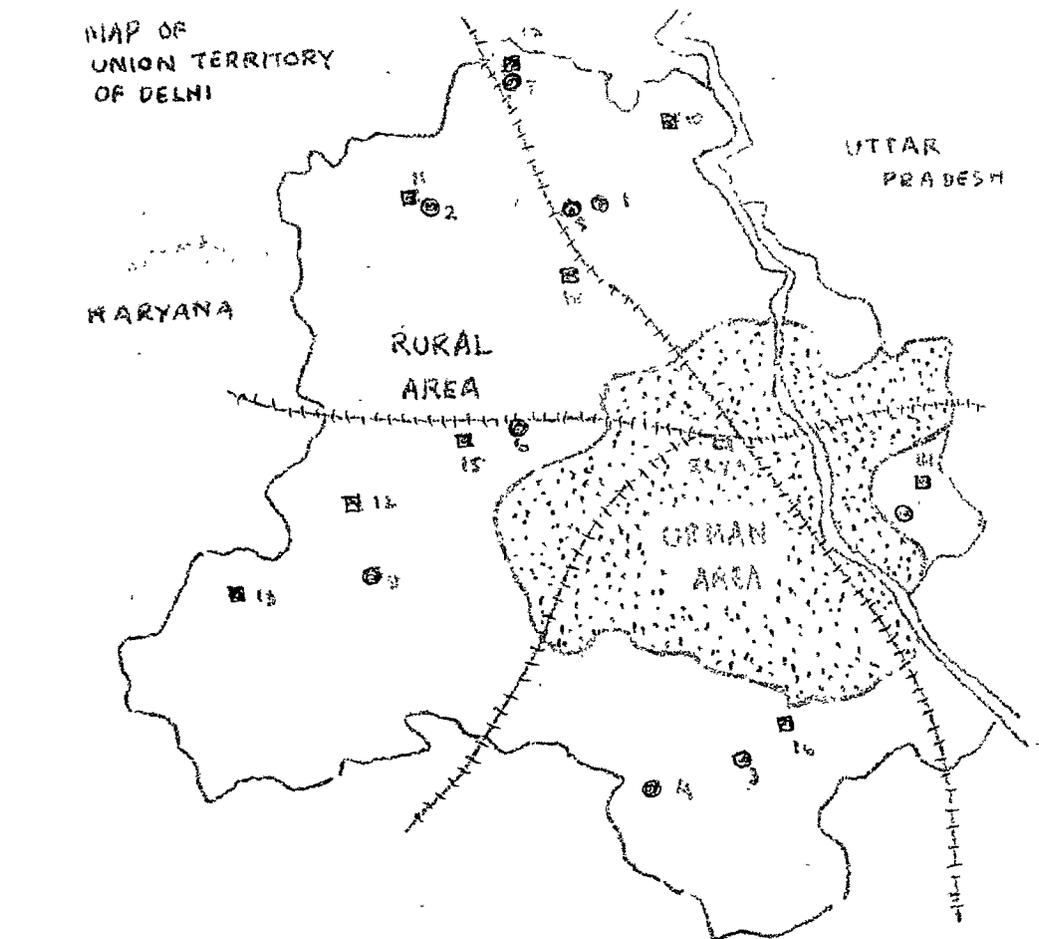
● ITV Schools
◙ Non-ITV Schools

Names of schools given in Appendix 2

Fig. 3.1 Location of the selected
rural schools

for drawing the samples of experimental and control schools. By using random number table, 9 television and 9 non-television schools were drawn. The schools thus selected are given in Appendix-2 and the location of the schools is shown in Fig.3.1.

The second stage of the sampling involved selection of students within each of the 9 experimental and 9 control schools. The study was confined to grade five students of the selected schools. Equal representation was given to the three caste groups. The information on the caste was taken from the class teachers. Children were already divided by the class teachers into three categories following a criterion adopted by the Corporation. The categories were: scheduled caste, backward caste, and upper caste.

In each school, all the children studying in grade five, irrespective of the sections, were considered together. They were divided into the three caste categories mentioned above. Thus. in each school, three lists of children, one for each caste category were prepared. From each list, a random sample of four children was drawn. For each category, two extra names were also listed, to be substituted, in case the original student was absent. Thus in each school a total of

<u>Table-3.1</u>

SAMPLE

Schools	Scheduled Caste	Backward Caste	Upper Caste
ITV Schools			
1. Alipur	4	4	4
2. Bawana Old	4	4	4
3. Chatterpur	4	4	4
4. Ghitorni	4	4.	4
5. Kheda Kala	4	4	4
6. Nangloi	4	4	4
7. Narela II	4	4	4
8. Patpad Gunj	4	4	4
9. Roshanpura	4	4	4
Total	36	36	36
Non-ITV Schools			
1. Bakhtawarpur	4	4	4
2. Bawana New	4	4	4
3. Dichau	4	4	4
4. Kair	4	4	4
5. Mandavali	4	4	4
6. Mundka	4	4	4
7. Nab Sarai	4	4	4
8. Narela I	4	4	4
9. Sahibabad-Daulatpur	4	4	4
Total	36	36	36

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12 students (with 6 extras) were drawn. This pro-cedure was uniformly followed in each of the 18 schools. The details of the sample drawn are given in Table-3.1.

In brief, the steps taken in drawing the sample were as follows:

1. The population of schools was defined in respect of school management, sex and grade.

2. Two matched lists of schools, namely, experimental schools and matched control schools were prepared.

3. From each of these two lists, an equal number of experimental and control schools were randomly drawn.

4. In each school, the grade five children were divided into three caste categories.

5. In each school, from each of these three caste categories, a fixed number of children were drawn randomly.

This procedure was uniformly applied in each of the selected schools. Thus, in this manner, from a total of 18 schools, a sample of 216 children was obtained.

Research Tools

The study required tools to measure behaviours related to curiosity, creativity, language, attitude and intelligence. Tests used to measure these behaviours are listed in Table-3.2. Some of these tools were readily available or could be used with minor modifications. Others had to be developed specifically for this study.

The tools that were developed specifically for this study were:

1. Curiosity Box
2. Curiosity Cards
3. Inquiry Card
4. Language Fluency Test
5. Language Refinement Test

The tools which were used after minor adaptations were:

1. Instances Procedure
2. Picture Construction Test

The tools which were used without any modifications were:

1. Attitude Towards School Inventory
2. Raven's Coloured Progressive Matrices

Table-3.2

VARIABLES, TOOLS AND OBTAINED MEASURES

Tool	Source	Measure	Remark
1	2	3	4
Curiosity			
1. Curiosity Box	Handerson & Moore (1979) Langevin (1972)	1.Time 2.Things 3.Questions	Developed
2. Curiosity Card	Berlyne (1964)	4.Curiosity Index	Developed
3. Inquiry Card	Yamamoto (1962)	5.Meaningful Questions	Developed
Language Expression			
4. Language Fluency Test	McCarthy (1930) Davis (1937)	6.Language Fluency	Developed
5. Language Refinement Test	Lado (1961) Valette (1967)	7.Language Refinement	Developed
Creativity			
6. Instances Procedure	Wallach & Kogan (1965)	8.Number 9.Uniqueness	Adapted
7. Picture Construction	Torrance (1960) Mehdi (1973)	10.Fluency 11.Originality 12.Flexibility	Adapted

Table—3.2 (Contd.)

1	2	3	4

Attitude and
Motivation

8. Attitude   International   13.Attitude   Original
   Towards School Association for 14.Motivation
   Inventory   Evaluation of
               Educational
               Achievement
               (1970)

Intelligence

9. Raven's
   Coloured Pro- Raven (1965)   15.Intelli-   Original
   gressive   gence
   Matrices

The description of the tools used in the study, procedure followed in their development or adaptation, are presented below.

1. Curiosity Box:

A survey of the instruments used to measure curiosity by different investigators (Berlyne, 1964, 1965; Day,1970; Handerson and Moore, 1979; Langevin, 1972; Maw and Maw, 1961; and Vidler and Rawan, 1961) was undertaken. This led to the development of three tools to measure curiosity.

Rationale: The Curiosity Box is based on the assumption

that when a number of curiosity producing articles are presented to the child, a curious child would explore more number of articles by physically manipulating them, will pay more time in examining them, and will ask more questions concerning them. In constructing this tool, procedures used by Langevin (1972) and Handerson and Moore (1979) were found useful.

Item Development: The first step in constructing this tool was to collect a large number of small articles, which the investigator thought may be novel, peculiar or puzzling to the child. Sixty such articles were shown to three judges who were told to rate them on a three point scale, namely, highly curious, average and least curious. The ratings of the three judges were combined to form a total rating index for each article. On the basis of these total ratings, 30 most curious articles were selected for inclusion in the box. The list of the articles selected is given in Appendix-3.

Try-out: The purpose of the try-out was to select a suitable format for presenting items to children; and to work out the procedure for administering and scoring the test. Two formats were tried: (1) In the first format, in a single box all the selected articles were put in a crowded and jumbled form, and (2) in the

Fig. 3.2 Curiosity Box

Fig. 3.3 Curiosity Box: Contents

second format, in a number of small identical boxes,
two or three articles were placed in each, and all the
boxes were presented simultaneously.

The try-out was carried out on a group of 10
children. The box/boxes were presented to each child
individually and he was asked to see the contents; and
to put any number of questions regarding them, if he
so desired. The investigator noted down the total time
taken by the child to see the contents, the articles
taken out of the box for examination, and the questions
asked regarding the contents.

The try-out revealed that out of the two forms
of presentation, the single box method discriminated
better and it was, therefore, retained for use in the
study.

On the basis of this try-out, the final instruc-
tions for test administration were also finalised.
These instructions are given in the Appendix-11. The
final tool with its contents is shown in Fig.3.2 and
3.3.

Scoring: Three scores were derived. These were: (1)
Time: the total time taken by the child to see the box.
The time is indicated in seconds. (2) Things: the total

number of things picked up by the child for exploration.
The maximum possible score is 30. (3) Questions: the
total number of questions asked. Each question gets
one score.

Reliability: There were difficulties in establishing
reliability by test-retest method. Once the items were
known to the children, in the second administration,
child may not find the items novel or complex. The
items would loose their curiosity value. Hence it was
thought proper to establish split-half reliability.
The items were divided into two sets, each possessing
reasonably equivalent novelty and complexity. This was
done taking into consideration the judges ratings. Thus
the two sets, each consisting of 15 items were put in
two separate boxes. They were administered separately
to the same group of children and the two sets of
scores were correlated. The split-half reliability
for the various measures was as follows: Time .82,
Things .87, and questions .73 (with Spearman Brown
Correction, N = 24).

   2. Curiosity Cards:

Rationale: Berlyne (1964) used tachistoscope in an
experimental situation and used the exposure time the

subject took as an index, to identify characteristics of the stimulus which produce curiosity. This procedure was adapted, in a simplified form in this tool. The method used here is to expose two types of pictures to the child: the ordinary or normal pictures, and the absurd or incongruous pictures. The curious child, it was assumed will take more time to see and explore incongruous pictures, in comparison to the normal pictures. The excess time the child would take to see the incongruous pictures over the normal pictures would be an indicator of the child's curiosity.

Item Development: Coloured cards of two types were designed for this purpose. The normal cards had pictures of common animals familiar to the child, such as a horse, a cow, etc. The incongruous cards consisted of pictures of animals drawn from imagination by combining the features of two animals into one, such as a tortoise with a long neck of a camel, a horse with the body of a parrot, etc. Sixteen such pictures, 8 normal and 8 incongruous were developed for the try-out.

Try-out: The purpose of the try-out was to find out if the children really discriminated between the normal and the incongruous cards, by giving more time to the incongruous cards. The two sets of cards were tried out

on a group of 10 children. The timings for each set was separately recorded. The try-out established that the children gave more time to see the incongruous set than the normal set.

The try-out indicated that the discrimination, that is the difference between the incongruous and the normal cards,could be increased by adding more cards. Hence the total number of cards was increased from 16 to 24. Two more modifications were carried out as a result of the try-out. An extra set of trial cards was included as a warm up exercise, timings of which were not taken into consideration. The other modification related to the inter-polation of normal and incongruous cards.

Thus, the final complete set consisted of 4 trial cards and 24 test cards, a total of 28 cards. These cards are given in Appendix-4. These cards were numbered at the back and the order of administration was fixed. To reduce the bias effect in presentation, the normal and the incongruous cards were interpolated as follows: ·

Trial Cards   A to D   four cards   normal and in-
                                           congruous in
                                           alternation

Test Cards   1 to 6   six cards   normal

              7 to 12   six cards   incongruous

              13 to 18 six cards   normal

              19 to 24 six cards   incongruous

The try-out helped to standardize a set testing procedure. The tester would give the pack of cards to the child and tell him that these cards contain pictures of animals from India and abroad, and would ask the child to see the cards. The detailed instructions are given in Appendix-11.

The child saw all the 28 cards in a continuous sequence. For the first four trial cards (A to D), the timings were not recorded. As soon as the child started seeing the 1st card the investigator would start recording the time and would again note down the time as soon as the 6th, 12th, 18th and 24th cards were seen by the child.

Scoring: The above recorded timings gave the viewing time for the following cards; 1 to 6, 7 to 12, 13 to 18, and 19 to 24. From these, the viewing time was calculated for normal cards (card no. 1 to 6,and 13 to 18) and for incongruous cards (7 to 12,and 19 to 24). The difference between the incongruous and normal

sets indicates the child's curiosity and has been termed as curiosity index.

Reliability: The split-half reliability was worked out. From viewing time for card 1 to 12 (6 normal and 6 incongruous cards) curiosity index was found for the first-half. Similarly from the viewing time for card 13 to 24 (6 normal and 6 incongruous cards) curiosity index for the second-half was found. This gave two curiosity indices on two equated sets, each consisting of normal and incongruous cards. The correlation of these sets gave a reliability of .91 (with Spearman Brown Correc tion, N = 48).

3. Inquiry Card:

Rationale: A child who is very curious, will exhibit a "need or a desire to know more about himself and/or his environment" (Maw and Maw, 1961). This child's need or desire to know more can best be studied by analysing the various inquiries made or questions asked by him. The instrument developed to assess the inquisitiveness of the child is based on the technique used by Yamamoto (1962). It uses a pictorial situation to provoke the child to ask questions.

In India, Passi (1979) included in his battery

of creativity tests, a similar test of inquisitiveness. A working metronome provided the stimulus (visual and sound) and children were asked to write as many questions as possible within six minutes.

Item Development: Initially a set of twenty pictures were collected which the investigator thought may provide the child with sufficient stimulus, to know more about its contents. These were shown to judges who were required to rate each picture for its potentiality to stimulate the child's inquisitiveness. Five pictures, which were judged to have more potentiality to provoke child's inquisitiveness, were selected for the try-out.

Try-out: The purpose of the try-out was to empirically select two pictures with high inquisitiveness. The five pictures already selected were tried out on 10 children. Each child was given one picture, at a time, and was asked to put questions orally concerning any aspect of the picture. On the basis of children's responses, two pictures which elucidated maximum questions were selected. The try-out also revealed that the technique was suitable to the concerned age group.

The two pictures finally selected were:

1. Activity at sea, near an harbour, with the ships moving in and out.

2. A place of worship, with its two spirals, a piece of old fashioned architecture.

These pictures are given in Appendix-5. The final test consisted of these two pictures mounted on a card, one below the other. On the basis of the try-out, a time limit of 5 minutes was considered sufficient. The instructions for test administration are given in Appendix-11.

Scoring: A simple criterion was evolved to score the questions. Many questions asked by the child could be answered by looking at the picture, while others could not be simply answered that way. Hence the questions asked were divided into two broad categories: (1) superfluous and (2) meaningful. If an answer to a question could be found by looking at the picture, it was called a superfluous question. But, if the question asked was such that it could not be answered by simply looking at the picture, it was categorised as meaningful. Only meaningful questions were considered for scoring purposes. Thus the total score was determined by adding the number of meaningful questions on the two stimulus

pictures. Some samples of meaningful and superfluous questions are given in Appendix-5.

Reliability: The two-item test was split into two halves, each with one picture. Questions asked on each picture were assigned scores and were processed for working out the reliability coefficient. The split-half reliability was found to be .73 (with Spearman Brown Correction, N = 48).

4. Language Fluency Test:

Rationale: McCarthy (1930) first introduced a technique to measure language fluency wherein she used toys, picture books, and similar other pictorial stimuli, in a reasonably standardized situation, to obtain verbalizations from subjects between 18 months and 54 months. Other investigators (Davis, 1937; Templin, 1957) have used this method. In the present study, the above method was adopted and only pictorial stimulus was used.

Item Development: A number of coloured pictures, all drawn by children were examined by three judges, to select a picture which would provide enough scope for the child to talk about. On the basis of their judgement, one picture was selected for the try-out. The selected picture depicted a typical village scene with

fields, cottages, cattle and village folks. The picture is given in Appendix-6.

Try-out: The try-out was carried out on a group of 10 children. The picture was shown to the child and he was asked to describe the picture. Whatever the child said was noted down verbatim. The try-out confirmed that the selected picture generated varying degrees of verbalization with different children. On the basis of the try-out a time limit of 2 minutes was arrived at.

Scoring: The total number of words verbalized by the child after seeing the picture were considered for scoring. Each word was assigned one score.

Reliability: Since the test had only one item, the test-retest technique for working out the reliability was applied. The reliability of the instrument was found to be .86, after a gap of one week, on a group of 24 children.

5. Language Refinement Test:

Rationale: Lado (1961) and Valette (1967) have recommmended two methods for testing pronunciation, one for individual administration and another for group administration. In the first one, the subject repeats what

the investigator says or responds verbally to a picture. In the second method, two alternatives are presented with different sound contrasts, and the subject is required to identify the right one. The second method has been used in the present study as it was feasible to apply it under group situation.

Item Development: Twenty items were prepared for the try-out, each item consisted of a pair of sentences. These sentences were identical with each other in every respect, except a key word. In one sentence the key word was from standard Hindi (Khadi Boli) and in the other, word was from local usage, almost identical in sound. As for example पृथ्वी and प्रिथबी (prithavi and prithabi).

Try-out: The purpose of the try-out was to see the workability of the instrument and to eliminate those items which were either too easy or too difficult. The try-out was carried out on 20 children. Items were orally presented to the children in a group situation. The children were required to indicate which of the two pronunciations was a better one. The children gave their answers by indicating either of the two alternatives. On the basis of this try-out, 15 items which were found to be of moderate difficulty level were

were retained. The final test and the instructions
for test administrations are given in Appendices 7 and
11 respectively.

Scoring: One score was given to each correct answer.
The total maximum score was 15.

Reliability: The split-half reliability of the instru-
ment was .75 (with Spearman Brown Correction, N = 48).

6. Instances Procedure:

Wallach and Kogan (1971) have used three verbal
procedures, namely, instances, alternate uses, and
similarities, in their battery of creativity. In the
present study, only the instances procedure has been
used, as a measure of verbal creativity.

Adaptation: No change was made in the content of items.
All the items were retained as they were but only the
example was changed to a more simpler one. The test
and the response sheet are given in Appendix-8.

Wallach and Kogan (1971) have used the test in
an individual situation without time limit. In the
present study the test was administered in a group
situation. A time limit of five minutes for each item
was fixed. The instructions for group administration

are given in Appendix-11. Separate scoring norms for originality were developed.

Scoring: The responses were scored on two measures of creativity, namely, (1) number and (2) uniqueness. Number is the sum of all the responses on the four items of the procedure. To workout the score, the number of responses are counted.

Those responses which are very rare, that is those which are given by only one per cent of the children are defined as unique responses. The scoring norms, were developed after the data was collected for the entire sample. Frequency distribution for different responses were compiled and using the above criteria, the unique responses were identified. These are given in Appendix-8. A child's total of all the unique responses on the four items, constituted his uniqueness score.

Reliability: The split-half reliability was found to be .81 for numbers and .60 for uniqueness (with Spearman Brown Correction, N = 48). Wallach and Kogan have reported a reliability of .76 and .51 respectively. Paramesh (1973) has reported reliabilities of .57 and .78 for the Indian sample.

7. Picture Construction Test:

To have a measure of non-verbal aspect of creativity, a picture construction technique was used. Torrance (1966) has used figural tasks in his creativity battery. These include drawing of pictures using egg like shape, schematic line forms and parallel lines. Mehdi (1973) has also used geometrical figures and other shapes in his battery. In the present study two figure drawing items, each consisting of a set of eight triangles and eight ellipses were used. The child was required to draw drawings using these figures.

Try-out: The test was tried out on a group of 10 children. It was observed that children had some difficulty in understanding the instructions. Hence, an illustration item was added. This facilitated the children to grasp the instructions, and to give responses. After observing children's performance, a time limit of 10 minutes was found sufficient for all children to work within.

The response sheet is given in the Appendix-9 and the instructions as finalized after the try-out are given in Appendix-11.

Scoring: The pictures drawn by children were scored

for (1) fluency, (2) originality, and (3) flexibility.

Fluency refers to the number of responses the individual is capable of giving. The total number of responses, on both the items, constitute an individual's fluency score. Though the maximum possible score was restricted to 16, it may be pointed out that 90 per cent of children have not scored beyond 10 and none has scored 16. This meant that the test provides sufficient margin and in no way hindered in the expression of fluency.

Originality refers to making of responses that are statistically unique or unusual. The scoring criterion for originality was evolved as per the procedure suggested by Torrance (1966) and Mehdi (1973). To calculate the originality score, norms were developed using the responses given by the total sample. For each of the two items, the different responses were tabulated and frequency for each response calculated. Weightages were given to these responses. Those responses which appeared rarely were given more credit than those which appeared more frequently. The criterion for credit, for different frequencies of

responses, is given below:

Credit	Response Frequency (in per cent)
5	0 - 0.99
4	1.- 1.99
3	2 - 2.99
2	3 - 3.99
1	4 - 4.99
0	5 - and above

Using this credit scheme, weightages were determined for the responses given. These are given in Appendix-9.

The flexibility refers to the ability to vary one's ideas over a wide range, even though this is not specifically called for. These have been scored after referring them to a common flexibility criterion. This has been given in the Appendix-9. One score is given to each category of idea. The total number of different categories of ideas the child expresses constitutes the score.

Reliability: The split-half reliability of the instrument has been worked out by correlating the scores on the two items of the test. The reliability was found to be .93 for fluency and .61 for originality

and .78 for flexibility (with Spearman Brown Correction, N = 48).

Validity of Curiosity, Creativity and Language Behaviour Measures

Three tests were used to measure curiosity, namely, curiosity box, curiosity cards, and inquiry card. These tests are based on Maw and Maw's (1961) concept of curiosity. This concept of curiosity was operationalised in the form of five curiosity measures (namely, time, things, question, meaningful questions, and curiosity index). The measuring situations and the obtained measures of curiosity may be considered to be valid to the extent that the concept as defined by Maw and Maw is acceptable. Some factorial studies (Langevin, 1972; Kreltler, Zigler, and Kreltler, 1975; and Handerson and Moore, 1979) on young children have used similar situational tasks.

As for the validity of the creativity tools are concerned, even the most widely used batteries (like Torrance's 1966) continue to be controversial. This is partly due to the complexity involved in validating the tool, the difficulty of the validating criterion and the definition of the concept itself.

Instances procedure used in the present study
is taken from the creativity battery devised by Wallach
and Kogan (1965). They have theorised about the gene-
ral associative concept of curiosity. Accordingly, the
total number of associates, a person is capable of
generating, and the relative uniqueness of the asso-
ciates, are indicators of his creativity. The instances
procedure try to bring out these two elements, at the
verbal level.

Wallach and Kogan (1965) have reported the item-
sum correlations of the various tasks. For the four
items of the instances procedure, the correlation for
the uniqueness measure ranges from .50 to .68; and for
number measure from .67 to .85. Both these measures
are significantly correlated with most of the other
eight tasks used in the battery. This suggests that
the instances procedure (which is one of the tasks used
in Wallach and Kogan's battery) could be considered as
valid procedure.

Picture construction test is another creativity
tool used in the present study. It is a figural task,
similar to the tasks used by Mehdi (1973), and Torrance
(1966). Torrance has sighted the studies giving the
construct validity of the battery, while Mehdi (1973)

has reported internal consistency of the test. These batteries are based on the factor analytical model of human intellect (Guilford, 1959; Guilford, Wilson and Christensen, 1952). Picture construction as a tool to measure non-verbal creativity, was therefore considered a valid technique.

As for the language behaviour is concerned two tests were constructed, namely, the language fluency test and the language refinement test. Recent advances in the study of language indicate that the measurement of language behaviour, particularly the language expression (oral) is highly complex. It involves phonetics, linguistics and other allied specializations. In the present study, attempt was made to measure language behaviour in a school situation rather than in laboratory. Therefore the emphasis was on the objectivity of the measuring instrument.

Perren (1968) has highlighted the problem of testing of spoken language where auditory and oral abilities are often closely involved with each other that they cannot be separated. Objective tests of spoken language, available at present in English, often appear extremely unsatisfactory. According to Wilkinson (1968) "insufficient work has been done on the

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validity of any type of oral expression test". In the oral language testing the emphasis is on objectivity.

The language fluency test, used in the present study, is more a technique, rather than a test. It has been used by many investigators (McCarthy, 1930, 1954) and over a long period of time. The language refinement test relies more on child's listening comprehension and judgment. Both tests use "quantitative objective testing techniques".

8. Attitude Towards School Inventory:

The inventory was originally developed for an international survey by the International Association for Evaluation of Educational Survey (1970). Therefore, the inventory has been translated and used in various foreign languages. In India it has been used in Hindi (Shukla, 1977).

Content: The inventory has 24 items. These items cover two areas: (1) attitude towards school and (2) motivation in learning. Keeping the elementary school child in mind, the items were presented orally, in a group situation. The child was required to respond to each item by indicating yes or no, by marking a tick or a cross. The inventory and the response sheet is given in the Appendix-10.

Scoring: All the positive responses are given a score of one. The inventory provides two scores, namely, (1) attitude towards school and (2) motivation in learning.

Reliability and Validity: Kumar (1972) has reported split-half reliabity of the instrument to be .79. He has also reported the power of discrimination of the test to be satisfactory.

9. Raven's Coloured Progressive Matrices:

This test is particularly useful as a screening device for groups where estimates of level of intelligence are required to be determined (Bortner, 1963). This instrument can be most suitably used with lower age group children where written language can be a handicap.

In the present study this test was used to equate the experimental and control group on intelligence, and to divide the children on the basis of intelligence into three categories. Progressive Matrices is a non-verbal test designed to measure Spearman's g factor (Raven, 1965). It consists of thirty six problems, each consisting of a design or a matrix from which a part has been removed. The subject examines the matrix

and chooses the correct part completing it. The test
consists of three sets, each with twelve matrices. The
coloured matrices are arranged "to assess the chief
cognitive processes of which children under 11 years
of age are usually capable...... and the scale of
thirty six problems as a whole is designed to assess
as accurately as possible mental development up to
intellectual maturity" (Raven, 1965).

In India, Rao (1974) and others have worked on
this instrument, but most of the work has been confined
to higher age group children.

Treatment

The treatment consisted of the exposure of
instructional television programmes to children. The
programmes were of twenty minutes duration. They were
telecast twice a week from the Delhi Television Centre.
The children selected in the treatment group (ITV
group) were such that they were exposed to these pro-
grammes during the two previous years, prior to data
collection, that is, during the academic year 1978-79
and 1979-80. Since the data collection started from
mid-October '80 to February '81, till the time of the
data collection, they had also seen almost half the

transmissions of 1980-81. Table-3.3 gives the total exposure during the period under consideration. The total exposures approximate 120 transmissions.

Table-3.3

THE NUMBER OF INSTRUCTIONAL TELEVISION TRANSMISSIONS
FOR ELEMENTARY SCHOOLS DURING THE LAST THREE
YEARS FROM DELHI CENTRE

Month	1978-79	1979-80	1980-81
July	3	3	3
August	8	9	7
September	8	6	4
October	6	6	6
November	8	8	8
December	-	-	6
January	7	7	6
February	7	8	7
March	-	-	4

Based on data supplied by Delhi Doordarshan.

The investigator made no effort to regulate the television exposure in the school. The exposure was allowed to operate in a normal manner. These schools were randomly drawn from amongst those which the inspector of schools had identified as having the most

satisfactory television operation. This was taken as sufficient assurance that the television treatment was carried out adequately.

Since there was no idea to link any specific impact to any particular programme, the entire treatment was taken as a package. The programme consisted of items of interest to children like stories, cartoons, scientific facts, things to do, biographies, songs, etc. A typical programme schedule for a particular month is given in the Appendix-1.

The treatment was received by children in a group situation. Usually the entire school would come out and sit in the science room where invariably the television would be kept.

During all this time, the non-treatment or control group (Non-ITV group) received no treatment. It was ensured that none of the children, whether in the treatment group, or in the control group, possessed television at home. There was hardly any likelihood of the non-treatment group children ever seeing the programme. The programme timings were during the school hours. Hence it is safe to assume that the non-treatment group never received the treatment.

Data Collection

A uniform testing procedure was adopted in both, the treatment and the non-treatment schools. The schools were not taken up in any particular order. Rather, they were taken up one after the other, as per the readiness of the school authorities, to make the students available for testing.

In each school the testing covered three to four days. On the first day, all the names of grade five students with their respective castes were noted down. These names were classified into three caste categories and three separate lists of scheduled caste, backward caste and upper caste students were prepared. From each list, by using random tables, a random sample was drawn, consisting of four students (and two extras, to replace students who may abstain on the first day of the testing). Thus a sample of 12 students (and 6 extras) was obtained.

On the second day, five group tests were administered. All the twelve children were comfortably seated, usually on mats. Some time was devoted to establish necessary rapport. The five group tests administered are given below. The approximate time

taken by each test, including instructions etc., is
given in the brackets. The order of the tests was
uniformly followed in all the schools. The tests were:

(1) Raven's Coloured Progressive Matrices
    (45 minutes)

(2) Language Refinement Test (15 minutes)

(3) Students Attitude Inventory (20 minutes)

(4) Instances Procedure (30 minutes)

(5) Picture Construction Test (25 minutes)

On the third day, individual testing was done.
The following four tests were administered in the
following order:

(1) Curiosity Cards

(2) Curiosity Box

(3) Inquiry Card

(4) Language Fluency Test

The individual testing session varied from 20
to 25 minutes per child. At a time, only one child was
called from his classroom. Only on his return, the
other child came. In case of any absentee, the testing
had to be carried over to the fourth day. The testing,
in eighteen schools, was completed in over a period of
four months, from the middle of October '80 to the
middle of February '81.

The data collected were scored and tabulated
for computer processing. The processing was undertaken
at the Computer Centre of the NCERT, New Delhi.