CHAPTER IV
DEVELOPMENT OF BRAIN STORMING TECHNIQUE PROGRAMME

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CHAPTER IV
DEVELOPMENT OF
BRAIN STORMING
TECHNIQUE PROGRAMME

This chapter describes the procedure followed for the development of Brain Storming Technique Programme.

4.1 PLANNING FOR BST PROGRAMME

No work can successfully be completed without being well-planned. What is considered well-planned has to be systematic, scientific, economic, logical and orderly one. In order to get well-planned work, there is need for intelligence, experiences, skills, materials and care that project has gone away due to lack of planning some small detail. Hence the meticulous care has been taken in the planning and carrying out of various procedures for the development of BSTP work.

From the review of chapter III, various types of educational programmes are found available for the development of creativity of the children.

For the development of creativity of the children
who were studying in class IX, investigator decided to select individual problems and group problems collectively. Because individual problems and their solutions concern with individual interest while group problems and their solutions need an individual and group brain storming to generate many possible solutions. Each of the problem in BSTP concerns with the day to day life of the students within and without classroom. The BSTP consists of individual ideational and group ideational problems for Brain storming.

A set of twenty problems divided into two parts namely individual type and group type of problems. The set of these twenty problems implemented on a small group of children of class IX.

Investigator adopted the following strategy before the development of BST programme.

1) Construction of BST Programme.
2) Try-out of the BSTP
3) Format of Brain Storming session.

4.2 CONSTRUCTION OF BST PROGRAMME

Before preparing a design of BSTP, the existing work done in this area was reviewed as in the third chapter with a view to select the types of problems to be included in the present BSTP to develop creativity of the
According to J.P. Guilford, minimum one month training should be provided to the children to get significant change in creativity of the teenagers. E. P. Torrance suggested that at least two months' training is essential for a definite change in the creative level of any person. Both of these references indicate that training period should be between one and two months. With the discussion of experts and views of the above said references, the investigator detailed the programme period of eight weeks. Sixteen problems were selected for the final form of BSTP because the training period was eight weeks. BSTP was administered twice a week.

Investigator selected a set of sixteen problems in final form of BSTP. It consisted of two types of problems which are (i) individual type of problems and (ii) general type of problems. These two types of problems were selected to satisfy the individual interest and general interest of the subjects.

**Individual and General Types of Problems**

1) Give your suggestions to solve the tie of reservation like ST/SC etc., in admission and appointments in all walks of life.

2) Give suggestions to eradicate the mal-practices
3) How would you adjust to equip yourself in the 21st century?

4) Give your opinion to bring discipline in the school.

5) How do you explain the reason for the coming of saucer kinds of foreign objects coming from other planets to the earth?

6) What are the measures do you use for your younger brothers and sisters to develop activeness in their life?

7) Give measures to develop reading habits.

8) In your classroom which kinds of things do you keep so that it looks like a novel or new.

9) How do you increase social relationship, wherever you work?

10) To think about waste, is not wastage thinking.

11) How would you make today's life, better for tomorrow?

12) To bring about equality in society, unequal opportunities, are to be provided.

13) Give measures to solve poverty in rich countries.

14) Give measures to bring down

15) Removal of untouchability.
16) Give measures to remove the fear of enemies in Northern frontier of India.

17) Give measures to avoid hurdles in checking the population explosion.

18) Measures to cut pollution.

19) What kind of education would you expect?

20) Give measures for milk or Dairy revolution.

Problems or statement numbers 2, 3, 5, 6, 7, 9, 11, 14 and 19 are individual type, while 1, 4, 8, 10, 12, 13, 15, 16, 17, 18 and 20 are general types. It is presumed that these types of problems are not of watertight compartment type.

Above said types of problems are discussed in the coming captions to justify their need for the development of creativity.

4.2.1 Preparation of Individual Type of Problems

Individual thinking is essential to develop creativity. Despite the advances in organized research, the creative power of the individual counts most. According to late Doctor Ernest Benger, "no idea had ever been generated except in a single human. No matter how one tosses this thought around or how one adds to it by consideration of the effect of getting people into a coordinated
organization, the fact still remains that every idea is the product of a single brain. Just some persons temperamentally can do their best creative work by themselves while other have to work on their own thought, the very nature of their calling.

Keeping in view the need of individual thinking to develop creativity of the children of class IX, individual type of problems and individual brainstorming sessions were selected for individual ideation which would be clear from the following illustrations with some expected non-creative and creative responses.

Individual Type of Problem and their expected Creative and Non-Creative Reasons:

**Problem-I**

How would you adjust to equip yourself to the 21st century?

**Expected Creative Responses:**

1) Compulsory implementation of computer education.

2) Space defence, against starwars should be developed.

3) Scientific methods, should be developed and be implemented in all walks of life.

4) National integration and international integration should be developed, such that to retain loving of humanity and resolve all the human problems.
Non-creative Responses:

1) Scientific attitudes should be developed among illiterate farmers to use modern technology in agriculture.

2) Importance of education should be increased.

3) Make aware people to curb population explosion through family welfare planning.

4) Internal conflicts among people at all levels should be eradicated.

4.2.2 Preparation of General Type of Problems

One way to enhance creativity is to make a data to team up with someone to collaboration. By working together and then individual, and then together, a pair is more likely to achieve the best in creative thinking. Two or more minds are always better than one judicially, they may warm up creativity at a times.

Importance of two-headed team-work and techniques of two somes made the investigator to construct group types problems for the study in hand.

Group type of problems would be clear from the following illustrations with some non-creative and creative responses as listed below.

Group Types of Problems and their Creative and Non-Creative Responses:
Problem-I
Give suggestions to eradicate mal-practices in examinations.

Expected Creative Responses:
1) Supervisor should not give any verbal or non-verbal instructions, except necessary ones.
2) Tobacco and match boxes of the habituated of them should be checked, if they are carried.
3) Personal bias should be avoided by the supervisor.
4) Teacher should not give important questions, if he is going to be paper-setter or supervisor or the same.

Non-Creative Responses:
1) Nothing should be written on the question papers, except Roll No.
2) To check the ribbon of the girls, by the lady supervisor.
3) Writings on the wall should be erased.
4) Examination hall should be opened in time.

Problem-II
How would you explain, the reason for the coming of saucer kinds of foreign objects, coming from the other planets to the earth?

Expected Creative Responses:
1) To know the environment and climate of the earth.
2) To see the organism on the earth.
3) To know the mineral of the earth.
4) To know the different kind of earth (mud).
5) To know the plants in sea water.

Non-Creative Responses:

1) Existence of human beings on this earth.
2) To know the life of the people on this world.
3) To know the religious importance of the earth.
4) To know kinds of industries.
5) To know the developments of education.

Thus, a pool of problems was constructed for Try-out purpose which was consisted of twenty problems. Individual type of problems and general types of problems were collectively used in BSTP to maintain consistency of the final programme.

4.3 TRY OUT OF THE BST PROGRAMME

Twenty problems were prepared for the development of creativity of the secondary school children of IX class as discussed in the above caption 4.2. Try-out of BSTP is to know essentially how the subjects interpret the instruction, how they arrive at the conclusions and how they work on Brain Storming problems. For these require-
ments. The process of try-out for BSTP is divided into three phases viz:

1. Pre-pilot try-out,
2. Pilot try-out, and
3. Selection of the Problems for BSTP.

4.3.1 Pre-Pilot Try-Out

Twenty sessions were organized by the investigator for the pilot try-out of the BSTP to develop creativity of the IX class students of secondary school. To justify the BSTP, investigator formulated the following general objectives for all problems and their materials.

General Objectives:

1) To decide whether the instructions for whole creative process provided to leader, note-takers and subjects properly understand.

2) To confirm whether programmes for BST is good enough to cultivate thinking habit, to eradicate the hurdles to creative thinking, to find out whether the subjects tried well the seven steps to more ideas developed by investigator, and to see whether the subject follow the suggestions given to them.

Before establishment of BSTP, investigator tried out all the necessitates to develop creativity of the subjects undergoing the newly developed BSTP. For this purpose, it was found necessary to try-out problems, training
to leader, training to note-takers, number of sessions, time limit, size of the sample, orientation and instructional material.

In order to meet these requirements, investigator first of all, decided to try out each of the problems included in BSTP as a pre-pilot one.

**Pre-pilot Try-Out of the BSTP Problems**

The specific objectives for the pre-pilot try-out of the BSTP problems listed as under:

1. To see whether the children follow the instructions properly.
2. To see whether the pupils oriented properly.
3. To confirm whether the students follow the language material of the problem posed before them.
4. To determine the time limit for each of the problem.
5. To check whether items of the problems were well with the students.
6. To fix up the necessary time interval for the relaxation.

For these specific objectives, the following points were observed and suggestions made as under:

1. Students were unable to imagine anything about first problem, because the rural students did not know about the tie of backward class reservation procedure made
by government. So the first problem was reshuffled for next try-out.

2. Subjects did not generate any individual session idea because they were accustomed with instructions imparted by school teachers. Investigator showed the need of bringing epoch, and also gave some more but essential importance to imagination to come to verdict after judicial ideas.

3. Children forgot many ideas. Investigator made them aware to note down any idea generated in mind. For this purpose small diary and pen provided to each subject under experiment to list down any idea where and whenever come in the mind.

4. The orientation material was found well. But sometimes subjects failed to keep it in mind the rules for session. For this, investigator suggested to leader to prepare basic rule on big flush card as shown in Appendix- B12.

5. Individual copies of the problems were necessary. So investigator provided individual copies of the problems to each of the participant under study.

6. Language of the problems was good but for the sake of eradication of ambiguity of manuscript written by hand which was not good for some subjects so Xerox copies were prepared and supplied to each individual.

7. The time-limit of one period was found mere. So
interval period was used for group brain storming session and it was found good to discuss because subjects at that time were in relaxed mood.

8. It was found that most of the items were useful to generate many ideas from the problem put before them.

9. Problem number 19: There was ambiguity in orientation instruction so it was reshuffled for next try-out.

10. For first three problems: Warming ups were found more essential. So investigator himself played active role to orient subject, and also taken the help of school teachers, principal and experts for this purpose. For problems 4 to 20 orientation were given in the problems which were found good enough to generate many imaginary ideas.

11. Time limit for evaluation session was enlarged to come to verdict from ideas with the help of teachers, principal of school, and leader, note-takers and some subjects with expert. (whenever experts available, they were invited).

4.3.2 Pilot Try-Out

Pilot Try-out for BSTP problems was made for the selection of the problems for final form of BSTP. It was made as follows:

4.3.2.1 Selection of the Problems for BSTP:
After pre-pilot try-out, BSTP problems were ready for pilot work. BSTP problems for pilot try-out were consisted a set of twenty problems. These problems were arranged according to subjects' creative responses in order to arrange them from simple to complex. For this purpose, investigator arranged the BSTP problems in the following table along with remarks and new order per problems.

### TABLE 4.1

<table>
<thead>
<tr>
<th>Problem No.</th>
<th>Creative Responses in %</th>
<th>Remarks</th>
<th>New order</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
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<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>4</td>
<td>12</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>1</th>
<th>6</th>
<th>12</th>
<th>20</th>
<th>above</th>
</tr>
</thead>
<tbody>
<tr>
<td>to</td>
<td>to</td>
<td>to</td>
<td>to</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>19</td>
<td>21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks**

- No creative response, dropped out.
- More creative responses selected for warm up session.
- More varied and more creative responses selected.
- Interesting item and responses are varied.
- More creative responses. Initiating item.
- More varied and more creative responses.
- More creative responses.

**New order**

- 0
- 1
- 3
- 4
- 2
- 3
- 12
<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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</thead>
<tbody>
<tr>
<td>8.</td>
<td>-</td>
<td>1</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>Interesting and good creative responses</td>
<td>8</td>
</tr>
<tr>
<td>9.</td>
<td>-</td>
<td>1</td>
<td>9</td>
<td>5</td>
<td>3</td>
<td>More creative responses</td>
<td>5</td>
</tr>
<tr>
<td>10.</td>
<td>-</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>More creative responses are middle category</td>
<td>11</td>
</tr>
<tr>
<td>12.</td>
<td>-</td>
<td>3</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>Good creative responses</td>
<td>16</td>
</tr>
<tr>
<td>12.</td>
<td>-</td>
<td>7</td>
<td>8</td>
<td>7</td>
<td>2</td>
<td>More creative responses</td>
<td>15</td>
</tr>
<tr>
<td>13.</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>More creative responses</td>
<td>16</td>
</tr>
<tr>
<td>14.</td>
<td>-</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>More creative and interesting responses</td>
<td>14</td>
</tr>
<tr>
<td>15.</td>
<td>-</td>
<td>0</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>More creative responses</td>
<td>13</td>
</tr>
<tr>
<td>16.</td>
<td>-</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>Creative responses are less</td>
<td>9</td>
</tr>
<tr>
<td>17.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>18.</td>
<td>-</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>More creative and varied responses</td>
<td>9</td>
</tr>
<tr>
<td>19.</td>
<td>-</td>
<td>1</td>
<td>9</td>
<td>4</td>
<td>4</td>
<td>More creative responses</td>
<td>6</td>
</tr>
<tr>
<td>20.</td>
<td>-</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>More creative responses</td>
<td>10</td>
</tr>
</tbody>
</table>
According to suggestion of B.K. Passi, the responses are classified by investigator as below:

- **Upto 32%** are creative responses
- **33%** and above are non-creative responses.
- **0 to 0.5%** responses of the sample are creative of the first category.
- **2 to 6%** responses of the sample are creative of the second category.
- **7 to 9%** responses of the sample are creative of the third category.
- **10 to 27%** responses of the sample are creative of the fourth category.
- **28% to 31%** responses of the sample are creative of the fifth category.

Keeping in view the above statistical procedure for having creative problem, sixteen problems for BSTP were selected which are shown in Appendix- B.

### 4.4 FORMAT FOR BRAIN STORMING SESSION

The value of a Brain storming session lies in the formality of the setting. The more formal the setting, the better, the more special the brain storming session is the more chance, there is of the participants leaving their inhibitions outside.
The formality of the session gives one the licence to do what one likes with one's own thoughts without reference to the criticism of others.

Investigator developed the following format for Brainstorming session:

1) Training the leader.
2) Training the Note-takers.
3) Invitation letter and Its Enclosures.
4) Group Formation.
5) Types of Session.
6) Time and Place.

4.4.1 Training the Leader

Investigator provided proper guidance and training to leader in advance for his function in conducting the brainstorming sessions. Necessary instructional material for panel discussion pertaining to creative thinking development had been given to him. For this,

1) Panel leader assiduously studied the principles and procedures for BSTP.

2) In advance, panel leader developed his own list of suggested solutions to the problems before each session to be held. He should keep those solutions at his disposal but whenever subjects wait to be heard for him, he would produce the ideas.
3) Investigator trained him to suggest some leads by motivational approach as "Let's look for on this problem; such-and-such an area...."

4) His first job in setting up a session is to process the problem. He had to broken down the problems in various sub-groups where and whenever they required.

5) He has to arrange a warm-up practice to orient session, for invited guests who were unfamiliar with Brainstorming session to attend meeting, in advance, he should supply them a copy of previous session ideas and prime a brief invitation letter.

6) He took active participation in the selection of the personnel. One or two, in advance of session, the participants were invited with copies of a background invitation letter of not more than two pages in length.

7) He should present the basic rule and prepare flash card, big to read all, for-
   (i) Ideation can be more productive, if criticism is excluded.
   (ii) The more ideas the better.
   (iii) Group ideation can be more productive than individual ideation.

8) He was trained to ring a bell whenever a subject violated any of the rules.
9) He must try to recognize the subjects, who raise their hand to signify that they have ideas to offer. Sometimes more subjects raise their hand, leader would ask each person to present his idea in turn.

10) He has given the instructions to encourage ideas that are directly sparked by previous idea. When several hands are up at the same time, the leader should give priority to the finger snappers and thus make the most of the power of associates brain storm.

11) He has to put out hints, especially by way of suggesting direction in which to look for ideas.

12) In closing the meeting, the leader first thanks all the participants, then he should ask them to keep the problem on their minds until the next day when they will be asked for evaluating session.

4.4.2 **Training the Note-takers**

The function of note takers have to record the permanent list of the many butterfly ideas that are put forward during the brain storming session. The task is difficult one since the nebulous ideas offered must be reduced to manageable note form. They have to write fast
for sometimes the ideas follow one another very rapidly. So the investigator had decided to have two note-takers and to train them with enough practise before they resume their duties in the Brain storming sessions.

The following points were kept in mind to train the note-takers.

1) They should sit next to the leader. They must be in direct line of conversation between him and the rest.

2) They should note down ideas.

3) For better accuracy of ideas to be noted, one note-taker should take even number ideas and the other should take odd number of ideas.

4) They can ask the leader to hold things until they catch up the ideas produced. They may also ask whether a particular summary of the ideas is acceptable or not.

5) They were free enough to assess whether the idea is new to be added to the list or whether it is already covered by a similar idea.

6) They should put down duplicate ideas than leave out different ones because duplicate ones can be removed later but the omitted ones are lost for ever.

7) They must prepare a notes in a form that is
immediately readable for the leader may ask for the list to be read out at any time.

The training was provided to note-takers keeping in mind the following objectives.

1) Whether the note-takers followed the duties allotted to them.
2) Whether the note-takers noted all the ideas properly.
3) Whether the two note-takers were enough.
4) Is it necessary to ring the bell by note-takers?

The following observations were made during the training that was provided to them.

1) It was found that two note-takers were enough to put down the ideas completely. One took the even number ideas and the other took odd number ideas.
2) In the beginning they wrote the ideas word-to-word but thereafter they were able to put down the ideas in brief on the basis of their importance.
3) Most of the time in solution of the assigned problem subjects remained silent. Note-takers were trained to ring the bell whenever chaos came.

Thus the note-takers were trained to note down ideas produced by participants during the brainstorming session.
4.4.3 Preparation of Invitation Letter and Its Enclosures

Two days in advance of the brainstorming sessions, the participants, leader, note-takers and experts were invited by invitation letter with its enclosures. Invitation letter with its enclosures was important to orient the subjects to act of and off-sleep on the problem for allowing incubation to enhance the working of in association. Invitation letter with its enclosures prepared for this purpose was issued over the signature of panel leader and investigator. Name of the subject, the time and place where and how sessions would be conducted were written in the first paragraph of invitation letter.

Keeping in view the following objectives, investigator prepared the invitation letters with its enclosures.

1) To see whether the subjects understood the instructional material given in invitation letter and in its enclosures.

2) To find out the importance of invitation letter with its enclosures.

3) To find out the effect of invitation letter and its enclosures on the attitude of rural children.

4) To see the effect of invitation letter and its enclosure to orient the subjects and sleep on the problem for allowing incubation to enhance the
working of the sessions.

The following observations and conclusions regarding the invitation letters and its enclosures were made by the investigator.

Invitation letters with their enclosures proved and satisfied the above objectives. It was found that the time table for each session should be orally discussed with all subjects, hence they can plan for their work.

In invitation letters, the following were the enclosures.

1. Orientation to the problem.
2. Obstacles to creative thinking and steps to overcome barriers were separately given.
3. About creativity.
4. Creative person and his characteristics.
5. Importance of creative thinking.

Above enclosures were given separately. Invitation letter with its enclosure is given in the final form of the BSTP in Appendix C.

4.4.4 Group Formation

Investigator formulated two equal groups on the basis of IQ levels. One for Brain Storming Technique Programme and the other for control group without treatment.
Unequal size of the boys and girls in both the groups. Their coverage age fluctuating between 14 to 16.

4.4.5 Types of Session

Four types of Brain Storming sessions were formulated by investigator as mentioned below:

1) Warm-up Session:
   It was formulated to orient participants and to create mood toward Brain Storming Technique Programme.

2) Individual Session:
   These types of sessions for each problem of BSTP were formulated to generate individual ideation.

3) Group Brain Storming Session:
   They were conducted for each problem to use cross stimulation for many imaginary ideas as far as they can.

4) Evaluating Sessions:
   They were formulated to evaluate ideas for verdict.

An important phase of Brain storming procedure is the gathering of post-session ideas. Any tendency to evaluate would kill spontaneity and convert the session into one of critical state. Evaluation sessions were established to develop judicial thinking rather than creative thinking. This type of sessions were held to select
those ideas which seem most promising. The best ideas are usually combination of other ideas. Therefore even during a BSS, every effort was made, thus to produce more and better productive ideas.

4.4.6 Time and Place

1. Time

Fora part of the day, recess, time of school was preferred which was the time of break-fast, for 30 minutes for BSS and evaluating session. In beginning three BSS one hour was required, for warming up the sessions. For the other BSS for problems five to twenty five minutes each was found enough to warm up. No time limit was adopted for individual ideation.

2. Place

Place for four types of BSS were as follows:

(i) Individual Ideation:

Wherever idea-imagination generated in the mind of subjects, they must note down wherever they may be. They must have pocket diary and pen to note down ideas generated in their mind. At any place, they note down ideas pertaining to BSTP problems.

(ii) Group Brain Storming Session:

Practical environment was used during this BSTP.
Open ground used for group BSS.

(iii) Warm Up Session:

For these sessions classroom was found effective.

(iv) Evaluating Session:

It is necessary to evaluate ideas generated during individual and group BSS. Experimental group evaluates ideas generated by them. Investigator used the playground which was natural in the school campus.

Actual time schedule is given in Appendix - B.

Thus, the investigator developed BSTP which is given in Appendix - B. Implementation and execution of this final BSTP is given in the next chapter.
REFERENCES : CHAPTER IV


