Chapter Five

The Experiment

"Argument is conclusive, but it does not remove doubt, so that the mind may rest in the sure knowledge of the truth, unless it finds it by the method of experiment."

— Roger Bacon
(as cited in brainyquote)

5.01 : Introduction

As stated in Chapter One, the researcher was interested in developing a training programme to increase the level of CIT (Creativity In Teaching) for B. Ed. Student teachers. The review of related literature revealed that a suitable training programme can improve creativity. Hence, the researcher decided to develop a training programme and test its effectiveness. This chapter discusses the experiment and is divided into two sections:

Section I – It describes decisions taken regarding the design of experiment, selection of college and selection of the tool.

Section II – It deals with the development of training programme and its implementation as well as interactions that occurred during the execution of the programme.
SECTION – I

5.02 : Decisions regarding experimental design

The main objective of the experimentation was to test the effectiveness of the training programme. So the programme prepared for raising the level of CIT was the independent variable. The dependent variable was ‘creativity in teaching’.

Different experimental designs were studied by the researcher and ‘Pretest-posttest control group design’ was selected as an experimental design.

It can be symbolically expressed as :

\[ R \quad O_1 \times O_2 \]
\[ R \quad O_3 \quad \rightarrow \quad O_4 \]

\( O_1 \ & O_3 \) – Pretest, \( X \) – treatment

\( O_2 \ & O_4 \) – Posttest, \( R \) – randomization.

5.03 : Selection of the College

It was decided to implement a programme on student teachers of College of Education from Sangamner; studying through Marathi medium.

This was chosen not only for the ease of administration, but the researcher also believed that the data and the inferences based on the analysis of the same from Sangamner would give a representative picture of any taluka level place of Maharashtra.
5.04 : Formation of Experimental and Control Group

Experimental and control group, consisting of 40 student teacher in each; were formed from 80 student teachers studying in G.E.S. College of Education, Sangamner during the academic year 2004-2005.

To achieve a proper representation of all teaching methods in both the groups, 50% student teachers were selected randomly from each method group.

Further these two groups of 40 student teachers were treated randomly and thus experimental and control groups were formed.

To control the contamination, a provision of one more control group was made. This group was of 80 student teachers from S.S.B. College of Education, Shrirampur. Since colleges of Education in Sangamner and Shrirampur are similar in many respects; i.e. both are at Taluka level place from ‘Ahmednagar District’. Both are aided and were established in 1969-70. The annual results of both colleges were almost the same. Student teachers are admitted in the same way. Both belong to renowned parent educational institutions. Thus, student teachers from Shrirampur were treated as one more control group.

All the three groups were tested initially for their creativity in teaching. Since the researcher was interested in finding out the effect of independent variables like emotional intelligence, creative thinking on Torrance test these tests also were initially given to the three groups. The experimental group and control group from Sangamner were pre and post tested at the same
time; whereas the control group of Shrirampur was pre and post tested in the same week in which the Sangamner groups were tested.

Out of these three groups, experimental group received the ‘programme’ treatment. Another two groups treated as control groups did not receive any kind of ‘programme’ treatment apart from their regular B. Ed. Programme.

5.05 : Internal and external validity

The pretest-posttest control group design controls all the factors affecting internal validity. As mentioned by Best (2003) all the factors history, maturation, testing, instrumentation, regression, selection, mortality, and interaction of selection and maturation were properly controlled and hence internal validity was ensured.

There was a threat to external validity – testing effect or sensitization to the treatment that a subject might gain due to pretest. But because the researcher was interested in raising the level of creativity in teaching, the prime need was to know the existing level of creativity in teaching and so the pretest was essential for the experiment. The student teachers of all the three groups were pretested in September 2004 and were posttested in February 2005. Programme was conducted in January 2005. So there was an ample gap of 3 to 4 months between pretest and actual experiment. In a busy schedule of B. Ed. Course, the possibility to remember the test items and get sensitized to the treatment was very low. The same was reflected in posttesting exercise.
While submitting the filled test, the researcher interacted with some student teachers asking them about the questions asked in the test. The student teachers replied that some 2-3 questions were repeated. (The test of creativity in teaching; Part III consists of 22 questions). This had happened in all the three groups. Hence it can be said that though the testing effect was not controlled totally, there may not be any considerable effect of it on the results.

5.06 : A step towards generalizability

The researcher was interested in testing the variable relationship of experimental setting in different situations. The programme prepared was initially executed on D. Ed. Student teachers. This was treated as a pilot study. After the experiment on B. Ed. student teachers was over, the same programme was implemented on some high school teachers of Sangamner. The effectiveness of the programme in different situations i.e. consistency was tested. It is discussed in the next chapter.

5.07 : Decisions regarding the tool

The test measuring ‘creativity in teaching’ was used as a tool to measure the effectiveness of the programme.

In addition to this test as pretest, two more tests were given to all the three groups initially.

They were Torrance test of creative thinking and Test of emotional intelligence. (Both these tests are standardized in English. The researcher used Marathi version of both the tests.)
5.08 : Development of the Programme

The review of related literature showed that there was no specific programme for enhancement of creativity in teaching. So the researcher decided to prepare such a programme. The steps in designing a training programme are as given in flow chart.

FLOW CHART 4 : Steps in designing a training programme
The process of its development is given below:

1. Deciding the content of the programme
2. Deciding the role of the researcher.
3. Planning of learning experiences.
4. Tryout of the programme.
5. Methods of evaluating the programme.

5.08(a): Deciding the content of the programme

The content was decided on the basis of the main objective of the programme and also by considering the guiding principles of curriculum construction of creativity mentioned in “Problems and issues of teaching and learning of creativity in Hong Kong schools” by Ming (2003).

These were –

1. Instead of mere discipline based approach, integration of knowledge and skills of creativity should be adopted.
2. One can not teach creativity out of context.
3. Rigidity in the classroom must be reduced.

The units decided broadly were –

- Concept of creativity
- Functions of L-R brain
- Characteristics of a creative person.
- Conducive and non-conducive factors to creativity.
- Factors of creativity in teaching and their interrelationship.
- Factors in the product aspect of creativity in teaching.
- Factors in the process aspect of creativity in teaching.
5.08(b) : Deciding the role of the researcher as a 'Programme co-ordinator'

This programme was to be implemented on B. Ed. student teachers i.e. 'adult learners'. According to Wodkowski and Knowles (1984), adults can be identified by two criteria; "an individual who performs roles associated by our culture with adults (worker, spouse, parent, soldier, responsible citizen) and an individual who perceives himself or herself to be responsible for his/her own life."

B. Ed. student teachers satisfy both the criteria. Hence 'Andragogic principles' (principles of adult learning) were to be followed in organising the programme of creativity in teaching.

In andragogic sessions, the role of instructor is to manage the processes and not to manage the content. Two way communication and feedback are critical. Instructor has to serve as a facilitator rather than a lecturer.

Once the andragogic principles were accepted, the acceptance of role of a teacher as facilitator accordingly was implicit.

Now the further question was "How these adults learn?" The appropriate learning theory obviously is 'constructivism'. Constructivism views learning as a 'process of knowledge construction' as mentioned by Von Glaserfeld (1995) (as cited in Catherine, 2005). The core part of constructivism is –

1. Building of conceptual structures through reflection and abstraction.
2. Construction of knowledge is highly related to the environment in which learning takes place.

3. Role of the teacher is significant. It is mentioned that teacher's role in constructivist approach is to provide multiple implications and applications of the concept in realistic, meaningful contexts and to make explicit the interconnections among knowledge components. The teacher should ask questions and listen carefully to student's interpretation of the data. The teacher should perceive errors as the results of the learner's conceptions for the moment.

This had helped the researcher to perceive clearly her role during the programme and to plan the learning experiences accordingly.

5.08(c) : Planning of learning experiences

The learning experiences were mostly based on following aspects:

1. Content and objectives of the programme.
2. Cultural context of student teachers.
3. Context of 'teaching-learning' process.
5. Availability of resources.

It was also decided that there should be maximum scope to interaction between participants and the researcher, participants and learning material and within participants.

5.08(d) : Try out of the Programme

As a pilot study, the researcher had conducted the 'Programme of Enhancement of Creativity in Teaching' (PECIT) on 43 student teachers of
D. Ed. College, Sangamner. It was conducted during 10/12/2004 to
27/12/2004 for fifteen days, one and half hour on each day. This was treated
as a pilot study. The programme schedule is given in Appendix M.

5.08(e) : Lessons learnt from the pilot study

1. Accepting the importance of openness in the feedback, D. Ed. student
teachers suggested that more time and more activities have to be
provided to elaborate the concept of open-mindedness.

2. Student teacher's response to process aspect questions of a post test
was not satisfactory. It showed that the process factors such as
redefinition and resourcefulness have to be stressed more through
various process orientations.

3. In general alternate and effective ways of explanation have to be thought
of by the researcher.

It was found that these D. Ed. student teachers co-operated well and
participated enthusiastically. They found the topics of creativity in teaching
totally new, interesting and important to them.

5.08(f) : Actions taken

In the plan of programme, two days rather two sessions were allotted
for each factor of process aspects of creativity in teaching. It was thought
essential to provide one more day for each aspect and to plan the learning
experiences accordingly.

In order to give more stress on 'openness', a display of particular
incidences of ‘Dahavi F’ (See theme of ‘Dahavi F’ in Appendix N)
through LCD projector and discussion on that was planned.
An extensive search on web and in library for creative puzzles and articles was undertaken to enrich the programme.

5.08(g) : Evaluation of the achievement of the training programme

Apart from the test of creativity in teaching, some more tools of evaluation were adopted.

In order to evaluate the daily process the extent of internalized knowledge, a 'Portfolio method' (concept of portfolio method in Appendix O) was decided to adopt. In that student teachers were asked 'What have I learned today?' 'How can I apply it while teaching?'

Besides this, some reflective questions, self assessment assignments were also given to have an idea of attitudinal change and process of introspection.

At the end of the programme, a feedback was also taken throwing light on teacher behaviour, classroom environment, methods adopted etc.

5.09 : Implementation of the Programme

The programme was executed on experimental group of 40 student teachers of G.E.S. College of Education, Sangamner. It was conducted during 3/1/2005 to 1/2/2005 (Appendix P). The timing was 2.30 pm to 4 pm. The total duration of the programme was 22 days and 35 hours (excluding Sunday, holidays of Makar Sankranti and Republic day). While implementing the programme, following precautions were taken.

1. Student teachers from experimental group were requested not to share the experiences obtained while participating in the programme with
others who were not in experimental group. Teacher educators of the college were also requested to keep themselves away from inquisition about the programme or to provide some inputs regarding the programme. In addition to this an arrangement of one more control group was made to control the contamination effect.

2. While implementing the programme, the questions of pretest were not referred, so that the experimenter bias can be avoided. All the discussions and inputs were irrespective of the pretest. Processes were focused and not the content of the pretest.

3. The researcher, though working in G.E.S. College of Education, Sangamner, was relieved from her duty from 1st Dec. 2004 due to fellowship for this study, from U.G.C. Hence she was not concerned with any day to day activities of student-teachers from Dec. 2004. Since the researcher was not related to any kind of internal evaluation of B. Ed. programme, a free and fair classroom environment was created easily. This has helped to reduce experimenter bias.

The Principal of the college permitted to conduct the experiment. Student teachers co-operated very well. There was no major difficulty during the execution of the programme. There was no experimental mortality in the conduct of the experiment.

The day to day happening details of the programme are enclosed in Appendix Q.
5.10: Observations by the researcher

On 17 days out of 22, the attendance was 90% and above. (The student teachers were present in the range of 36-40).

In the remaining 5 days, the attendance was between 80-90% (32-35 student teachers were present). It was due to the holiday of 'Makar Sankranti', students resided nearby Sangamner, went to their native place before one day and came after one day of Makar Sankranti. Also after the Republic day, the same thing happened. There were some financial reasons behind that absence. They could save their expenses on food.

- Students were found eager to know about what everydays session was about.
- The formation of groups was done through cards. Normally a group of five students was made. Forty cards were prepared. Each card was having any number from one to eight. Hence there were 5 cards of one, 5 cards of two........ and so on. This set of cards was shuffled. While entering in the classroom, one card was allotted to each and was asked to take a seat in a corresponding group. On each day the cards got reshuffled. Hence the members of the groups were also changed every time and this helped to add freshness in interactions within the group. Due to this each student teacher got a better chance to interact with more number of participants.
- The classroom atmosphere was free and fair. Everybody was free to ask questions, to criticize, to share his views in the group and in the class also.
The pictures, puzzles and methods used during the programme helped open them more and more.

The discussions were very lively. If on a day, any article or passage was not given to read and analyse, or if a puzzle was not given, the student teachers used to remind the researcher about that. After a few days they started coming before time or waited after the session to discuss about any problem or a situation that they faced during their practice lessons. They started sharing the puzzles they had and discussing about the process of solving it. They started using the terminological words like open-minded or close-minded, changing of focus, use your right brain, you also are creative while talking with others.

One incidence would be helpful to see that students had started constructing their own knowledge of creativity. In a local newspaper ('Sarvamat' on 10 Jan. 2005), a speech of a socialist thinker and writer Raosaheb Kasabe was given. He had elaborated the process of creative writing and emphasized the importance of being open to experiences. After reading this, some student teachers brought that paper in the programme and they shared it among other student teachers also.

They had realized the importance of openness intensely. It was observed by the researcher that the student teachers who were some what egotistic, aggressive and having some biases, started introspecting during the session, they gradually became quiet in the session. It was found that in the self analysis assignment of that day, they have mentioned the reality -the change in self.
However, everything was not so smooth as mentioned earlier. There were some instances where the researcher had to manage the process in proper direction. Since in a B. Ed. course, classroom teaching generally takes place through lecture method, most of the student teachers were not familiar with the group work, group discussion etc. So some critical instances had occurred in some groups, where the researcher intervened to stop the persona allegations, reminding the principles of openness. But these incidences also had enriched the researcher and the participants a lot.

5.11 Analysis of Portfolio Cards

Every day at the end of the session, a card sheet of size 11 inch × 7 inch was given. It was divided into two sections in the length. Student teachers were asked to write 'What is learnt today?' in the left section and 'How will I apply it while teaching?' in the right section. In every next day they used to submit this card with their answers. As a whole it can be said that 85-90% student teachers submitted it regularly.

While analyzing these cards were grouped topic wise, instead of daily analysis. There were some topics which continued for 2-3 days. So it became helpful to find out the learning outcome of a 'topic'.

Topic 1: Left-right brain functions:

Student teachers had mainly responded that –

1. They would ask more open-ended questions in the class than the fixed response questions.

2. They would provide more scope to draw pictures and to imagine.
3. While setting the question papers, they would take the precaution that there would be a balance of questions for left and right hemispheres of brain.

**Topic 2: Conducive and non-conducive factors to creativity**

Overall trend of responses of student teachers was –

1. They would behave friendly with students.
2. They would give enough space for each student to express.
3. They would keep democratic atmosphere in the classroom.
4. They would encourage their students to participate in various activities.
5. They would appreciate the performance of their students.
6. They would strictly avoid any bias among the students.

**Topic 3: Product factors (Fluency, flexibility, originality, elaboration) of creativity in teaching**

1. They would motivate students to read more and would make due provision.
2. They would try to provide variety of experiences while teaching.
3. They would create opportunities to think through extrapolation.
4. They would try to add more and more details while explaining and would create such opportunities for their students also.
5. They would find out fluency, flexibility and hence originality of their students.
6. They would think of alternate ways of making introduction of a topic.

**Topic 4: Open-mindedness**

The majority student teachers responded like this –
1. I myself would try to be more and more open-minded.
2. I would not keep any bias while interacting with students.
3. I would examine my value system thoroughly.
4. I would accept openly my mistakes if any and even if they were pointed out by my students also.
5. While teaching, checking of answer papers; I would not keep any kind of prejudice.
6. I would always try to maintain democratic atmosphere in the class.
7. I could now easily identify open-minded persons.
8. I would always keep in mind that differences should be for the opinions or views and not for the person.

**Topic 5 : Sensitivity to the problem**

The trend of the student teachers responses were –

1. They would develop a habit of keen observation among their students.
2. They would try to be a good listener.
3. While dealing with a problem, they would try to find out the variable relationship and would decide the variables beyond and within control.
4. They would keep themselves aware of the changes in the field and also future changes going to happen in the field.

**Topic 6 : Redefinition**

The majority of responses were –

1. They would change the frame of reference of thinking.
2. They would re-organise the teaching points considering various sequences.
3. They would redefine their ways to motivate students.

4. They would use SCAMPER (Substitution, Combination, Adaptation, Magnification/Minimization, Put to other use, Elimination, Reversal) technique for various jobs that a teacher has to do.

They were –

a) To think about the new pattern of question papers.

b) To combine the strengths of various teaching methods and develop an effective method.

c) To prepare teaching as well as learning material.

d) To think about the new ways of various cultural activities in the school.

e) To suggest the reforms in examination system.

**Topic 7 : Resourcefulness**

The overall trend of responses was as under –

1. They would try to find out effective methods of teaching.

2. They would think collectively about the nature of the problem and related factors in the circumstances to find out the solution.

3. They would use brainstorming method to decide:

a) The subjects for essay, elocution competitions.

b) To sort out the problem of indiscipline.

c) To prepare various educational games.

d) To think about ways to improve school results.
4. They would use this technique (brainstorming) during the planning of learning experiences, the framing of question papers for their internship programme.

These responses show that student teachers found the programme useful. They had thought of using the programme content - either knowledge, principles or methods and techniques in their teaching practice. The programme content was related by them to teacher behaviour, classroom interaction, teaching methods, evaluation, extracurricular activities and problems in this field, at an application level.

Besides this portfolio method, some points for self analysis were also provided. To have an idea about their integrity, some are mentioned here. During the sessions, one self analysis exercise was:

Out of the characteristics of creative person

I have ..........

I should acquire ..............

I should change ..............

The responses were :-

Student teachers mentioned that they possessed interest in many fields, curiosity confidence and perseverance. According to them, they should acquire openness, mental preparation to accept and stand firm for their unusual, different opinion, the skills to handle effectively the ambiguous mental situations, a positive/assertive mindset and risk-taking mentality. They mentioned that there should be changes in their 'over aggressiveness, over confidence, autocratic attitude, carelessness, whimsicalness.
Further while noting the conducive and non-conducive factors to creativity that they received during their school days, it was mentioned –

a) Factors conducive to creativity from school - majority responses for these factors were:
   1. Effective teaching
   2. Motivation
   3. Variety of experiences

b) Factors non-conducive to creativity from school -
   1. Prejudices
   2. Curt behaviour with students.
   5. Various restrictions in school.

c) Factors conducive to creativity in home -
   1. Motivation
   2. Mental support
   3. Love and faith
   4. Forgiveness to mistakes
   5. Role model

d) Factors non-conducive to creativity in home -
   1. Strong criticism
   2. Comparison
3. Lack of faith
4. Narrow-mindedness
5. More and more restrictions
6. No freedom to choose subjects or plan career.

It was found that the student teachers had introspected honestly, even mentioning the incidences from their school and home also. This exercise might had helped them to synthesize their personal experiences with the programme content and to construct a healthy outlook towards their behaviour as a teacher.

5.12 : Analysis of Participants’ (student teachers’) feedback

A sheet for mentioning their feedback was provided and points were suggested. All the 40 student teachers gave their feedback. A feedback form is attached in the Appendix R.

Points suggested for the feedback were: Learning experiences, methods adopted, classroom atmosphere, openness of the researcher, classwork and homework, enrichment if any, suggestions for the improvement of the programme.

- **About the learning experiences**: Twenty nine students mentioned that there was variety of and relevant in learning experiences. Five of them described them as of high quality. Three of them termed them as motivating and very effective.
- Classroom atmosphere according to thirty three student teachers was free and hence healthy and effective interactions took place. Five of
them mentioned that there was a live and enthusiastic atmosphere in the class. Whereas five students mentioned that though the atmosphere was free, there were some controversial incidences. They need to be avoided.

- Thirty eight participants admitted that the researcher was open-minded and this helped create conducive atmosphere in class whereas two student teachers noted that the researcher was open only to some extent.

- While opining on the class work and home work, they mentioned that the topics for class work were interesting, thought provoking and to work in a group was a fun. Whereas homework was some what revisory type (2), reinforcing and on application level (17) and also thought provoking (5) according to them. (But the only difference was home work was to be done individually.)

- Expressing about their enrichment due to this programme, twenty eight participants mentioned that there was a substantial addition in their knowledge about creativity. The most thrilling thing according to a four of them was the realization that they themselves also were creative and could improve upon it.

  Seventeen student teachers mentioned that their thinking process had improved. Instead of thinking about the routine answer, they started to think of alternate solutions. They experienced that their thinking and decision-making process got accelerated.
Most of them (33) identified that due to this programme there was an increase in confidence, in boldness significantly. Seven student teachers mentioned that a strong willing to be a creative teacher was developed. Few of them (2) started to locate themselves on the continuum of openness and creative personality. Majority of them (35) noticed an improvement in their personality without mentioning any specific aspect.

A complete shift in attitude was observed by sixteen participants. They started thinking without considering any prejudice or bias. An assertive or positive attitude was adopted by some participants giving up their cynical mindset.

While noting the things new to them fifteen student teachers were mentioned that everything was new to them. According to eight of them seating arrangement was new, whereas the passages, articles were new for almost all (37) of them. The SCAMPER, attribute listing, brainstorming techniques were new to majority (34) of them. The pictures, cartoons displayed on transparencies, the puzzles, games the use of LCD, the interactive CDs of creativity, meaningful title to portfolio cards, a relevant thought as an advanced organizer were mentioned by the student teachers as new to them.

Out of 40 participants, eighteen participants gave their suggestions. They were –

1. The programme duration should be more. (2)

2. There should be more exercises for homework. (2)
3. Instead of appealing to students to participate in the discussion, it should be made compulsory.

4. There should be no home work. (2)

5. In a session of one and half hour there should be a break of 5-10 minutes. (1)

6. There should not be any controversial incidence. (2)

7. Instead of mixed groups, there should be separate groups of male and female student teachers. (1)

8. This programme should be conducted in the morning. (1)

9. There should be less home work. (1)

10. The discussion should be recorded. (1)

11. The thoughts should be in Marathi. (1)

12. There should be use of simple language. (1)

13. Instead of classroom, this programme should be conducted in a garden or under a tree. (1)

14. Think always from participants’ point of view. (1)

(Numbers in brackets indicate the number of participants)

As a whole, from the analysis of portfolio cards and feedback, it can be said that the fruitful learning of creativity in teaching had taken place.

The statistical analysis of the data of pre and post test would provide an evidence to the inference. It is given in the next chapter.

Before that, some qualitative data regarding the Application of the programme content by the participants in their internship programme would support the above inference.
5.13 : Application of 'Programme' in internship


The researcher could contact 20-22 student teachers of experimental group, 10-12 days after the commencement of internship programme. She asked them whether they had applied the things that were learnt in the programme. (PECIT) It was found that almost all of them had used the puzzles and games in the class when they were asked to conduct a class as an 'off-period'.

Besides that, some (8-10) student teachers shared their experiences about their adaptation of openness and its effect on improvement in classroom interactions. "Without shouting, taunting, threatening it became possible to control the class, because we have started listening to their problems, we have started to think from their point of view" said a group of 3 student teachers.

One student teacher had confessed that before the programme, "I was never interested in listening to the students and was expecting that they should listen to me. I even asked them to take their seat after the half part of the answer is over. But now I have started to listen carefully to the students and I found that students also are co-operating with me." Being a post-graduate in English, one student teacher had never accepted the class below standard VIII for his practice lessons. But before internship he thought "Why not? This is also challenging. Let me have this experience also." He
admitted that this change was only due to the programme. One student teacher had pointed out the change by saying, "Practice lessons were merely mechanical to me. I never paid attention to all the students. My focus was on the front seaters only. But now (i.e. after the programme) I have started to go near the students who were not answering, not doing what is asked to do or doing anything else. I have started asking them whether they had understood properly or not; if not, I have tried to explain going beyond the planning.' One student teacher had tried successfully a method of 'Group discussion' for teaching 'Natural resources' on VIIIth class.

Some (4-5) student teachers had noticed that 'elaboration' of a term was increased. Extrapolation was also tried. "What would have happened if there was no Shivaji?" was a question posed by a student teacher on 8th History class. 5-6 student teachers had noted that more open-ended questions were being asked now, while planning lessons, variety in questions of evaluation, various learning situations were came to mind while thinking and that too very spontaneously.

2 student teachers had noted an interesting attitudinal change. One of them read ‘अन्निपंख’ (Agnipankh by APJ Abdul Kalam) and 'I dare' by Kiran Bedi, after the experiment. And the other watched two movies, they were ‘रचदेस’ (Swadesh) and ‘दहावी फ’ (Dahavi F) (again).

They told that due to this programme, their understanding and appreciation of these books and movies was increased. They identified the factors of sensitivity to the problem, openness…….. etc. in many instances.
It seems that, the factors of creativity in teaching had provided them a new vision to interpret. As a whole, it can be said that the programme was internalized in both cognitive as well as affective domains. The methods, techniques, principles were applied in lesson planning, in evaluation, in classroom teaching etc. and a new perspective was gained.

5.14 : Time Analysis of the Programme

The programme was run for 22 days and on an average one and half hour each i.e. for thirty five clock hours.

The time spent on various items was recorded in a diary. It shows that –

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Time spent in minutes</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Explanation/Lecture by the researcher</td>
<td>330</td>
<td>15.71%</td>
</tr>
<tr>
<td>2.</td>
<td>Group work (including group discussion)</td>
<td>345</td>
<td>16.43%</td>
</tr>
<tr>
<td>3.</td>
<td>Presentation of group work and discussion on that</td>
<td>360</td>
<td>17.14%</td>
</tr>
<tr>
<td>4.</td>
<td>Reading of article/passage and its analysis and discussion</td>
<td>255</td>
<td>12.14%</td>
</tr>
<tr>
<td>5.</td>
<td>Discussion in a whole class</td>
<td>220</td>
<td>10.48%</td>
</tr>
<tr>
<td>6.</td>
<td>Watching CDs</td>
<td>120</td>
<td>5.71%</td>
</tr>
<tr>
<td>7.</td>
<td>Observation of pictures</td>
<td>55</td>
<td>2.62%</td>
</tr>
<tr>
<td>8.</td>
<td>Role play</td>
<td>60</td>
<td>2.86%</td>
</tr>
<tr>
<td>9.</td>
<td>Enquiry training model</td>
<td>10</td>
<td>0.48%</td>
</tr>
<tr>
<td>10.</td>
<td>Jurisprudential enquiry model</td>
<td>15</td>
<td>0.71%</td>
</tr>
<tr>
<td>11.</td>
<td>Queries and question answers</td>
<td>130</td>
<td>6.91%</td>
</tr>
<tr>
<td>12.</td>
<td>H. W. (distribution, collection)</td>
<td>105</td>
<td>5%</td>
</tr>
<tr>
<td>13.</td>
<td>Miscellaneous (Distribution of reading material, group arrangement etc.)</td>
<td>95</td>
<td>4.52%</td>
</tr>
<tr>
<td></td>
<td>Total :</td>
<td>2100 min.</td>
<td>100%</td>
</tr>
</tbody>
</table>

i.e. 35 hours.
The above table indicates that, more than 50% time (item No. 2, 3, 4, 5 combinedly) was spent on student centered activities. Where as compared to above, only 15% was gone to the account of teachers' lecture.

A pie chart 2 would give a more clear idea easily.

PIE CHART 2 : Time analysis of programme

It can be said that the above data of time analysis supports that andragogic principles were followed during the programme and teacher mainly had performed the role of facilitator.

5.15 : Characteristic Features of the Programme

1. Selection of learning material from autobiographies of reknowned literary artists, scientists, social scientists etc. It was context specific.
2. Divergence in learning experiences and adoption of interdisciplinary approach.

3. Multilevel flow of communication between and within group.

4. Use of advanced organizer on each day.

5. Facilitating approach, democratic attitude.

6. Open and conducive to learning atmosphere in class.

Summary:

In this chapter, the researcher has tried to inform about the design of experiment, selection of tool and details of programme implementation. The feedback from student teachers and their behaviour changes after the programme were also discussed in this chapter.

"The true method of knowledge is experiment."

— William Blake
(as cited in Thinkexist)
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निर्माता : सुमित्रा भावे, सुनील सुकथनकर

विचित्र निर्मिती, पुणे