CHAPTER - V
SUMMARY
5.1 INTRODUCTION:

The National Policy on Education (NPE) envisages that free and compulsory education of satisfactory quality should be provided to all children up to the age of 14 years, before we enter the 21st century. The 83rd Constitutional Amendment Bill has been introduced in the Rajya Sabha to make the right to elementary education a fundamental right and a fundamental duty. The target of Universalizing elementary education has been divided into three broad parameters, i.e., universal access, universal retention and universal achievement during the Eighth Five Year Plan. As a result of the efforts made by the Central Government and State Governments, 94 percent of the country’s rural population has been provided with primary schools within one km and 84 percent within three kms. Government of India launched a scheme, known as SSA in the year 2001-2002. The programme aims to free and compulsory education for all children up to the age of 14 years by 2010. All these aims to develop India as one of the developed country in the world by 2020.

Primary school plays an important role in the life of an individual in laying a sound foundation of learning. Teaching mathematics in the primary schools is one of the most challenging tasks for even the best of teachers.
The need to have a strong foundation in mathematics from younger age is accepted by both parents and teachers. Achievement in mathematics is affected by numerous factors ranging from individual student’s thinking ability to instructional strategies in learning the subject. It is the duty of the teachers to enable the children to learn mathematics with interest.

5.2 NEED AND SIGNIFICANCE OF THE STUDY:

The investigator is working as a lecturer in DIET Krishnagiri in IFIC branch. The investigator conducts in-service training to the teachers. The achievement of student is not up to the mark even if the training is given to the teachers. So the investigator wanted to know the effectiveness of training in the class room teaching. As suggested by the guide, instead of studying the effectiveness of DTERT training, the investigator prepared a module and gave training to the teachers. Primary mathematics includes mathematics for class 1 to 5. present study aims to class IV mathematics, because the number of competencies to be achieved by class IV students is 60 which is the maximum number of competencies in the list. Statement problems need language skill also. Present study helps the students to write statement from the question. Hence the investigator selected this topic for the study.

5.3 SCOPE OF THE STUDY:

Learning mathematics with interest is a great task. As the investigator visited schools and examined the answer sheets of the students for the purpose of training found that the students are not answering the statement
problems. This study will motivate the students to learn mathematics with confident and interest. Activity based learning makes the students to think and bring out their creativity. This will automatically arouse their interest. Coining words for statement problem is another task for the students. Module prepared by the investigator makes the process of statement easier by introducing activity cards. Once the interest aroused will not be stopped. So this will surely help the students and teachers.

5.4 STATEMENT OF THE PROBLEM:

Primary school teachers are loaded with lot of works apart from teaching. They are filling nearly sixty forms for SSA regarding school particulars. They are engaged to take school census every year, election duty whenever election comes, attending 20 days in-service training programmes, distributing the government sanctioning benefits to the students. Even if they have interest to teach for each child individually they don’t have enough time. Present system of education focuses on syllabus completion and examination. In primary schools all students are promoted to other classes compulsorily. There is no failure even though they do not achieve the competencies. They need attendance. Irregularity in attendance of students affects the quality of education. So to overcome these problems present study focuses on the activity based teaching methodology. Hence the investigator has chosen the topic “Impact of in-service training in the classroom teaching of primary mathematics.”
5.5 OBJECTIVES:

➢ To know teachers prior knowledge on content and methodology in class IV mathematics.
➢ To develop module for teachers to teach class IV mathematics.
➢ To organize training programme in the module prepared for teachers handling class IV mathematics.
➢ To find out teachers attitude towards in-service training programmes.
➢ To find out the prior knowledge of the students in mathematics of class III.

➢ To find out effect of training programme in teaching mathematics for class IV.

5.6 HYPOTHESES:

Hypotheses are framed based on the objectives of the study. It was framed to find out the significant difference among pre-test, post-test-1 and post-test-2 of students and attitude of primary teachers towards the training programme. Hypotheses were formulated based on the variable gender.

• There is no significant difference between the experimental group and control group teachers on content & methodology of IV mathematics.
There will be a significant difference between pre test and post test scores of experimental group teachers towards impact of in-service training.

There is no significant difference between pre test scores on achievement in mathematics for experimental group & control group students for total sample.

There will be a significant difference between post test-1 scores on achievement in mathematics for experimental group & control group students for total sample.

There will be a significant difference between post test-2 scores on achievement in mathematics for experimental group & control group students for total sample.

There will be a significant difference between pre-test & post test-1 on achievement in mathematics for experimental group for total sample.

There will be a significant difference between pre-test & post test-2 on achievement in mathematics for experimental group for total sample.

There is no significant difference between post-test-1 & post test-2 on achievement in mathematics for experimental group for total sample.
• There is no significant difference between pre-test & post-test 1 on achievement in mathematics for control group for total sample.

• There is no significant difference between pre-test & post-test 2 on achievement in mathematics for control group for total sample.

• There is no significant difference between post-test 1 & post-test 2 on achievement in mathematics for control group for total sample.

• There is no significant difference between pre-test scores on achievement in mathematics for experimental group boys and girls.

• There is no significant difference between post-test 1 scores on achievement in mathematics for experimental group boys and girls.

• There is no significant difference between post-test 2 scores on achievement in mathematics for experimental group boys and girls.

• There will be a significant mean difference between pre-test and post-test 1 scores on achievement in mathematics for experimental group students.

• There will be a significant mean difference between pre-test and post-test 2 scores on achievement in mathematics for experimental group students.

• There is no significant mean difference between post-test 1 and post-test 2 scores on achievement in mathematics for experimental group students.
• There is no significant mean difference between pre test and post test -1 scores on achievement in mathematics for control group school students.

• There is no significant mean difference between pre test and post test -2 scores on achievement in mathematics for control group school students.

• There is no significant mean difference between post test-1 and post test -2 scores on achievement in mathematics for control group school students.

• There will be a significant difference between high achievers and low achievers on pre test & post test -1 scores of experimental group.

• There will be a significant difference between high achievers and low achievers on pre test & post test -2 scores of experimental group.

5.7 ASSUMPTIONS:

In-service training helps teachers to improve their teaching skill. For all the teachers teaching classes from 1 to 8 must attend 20 days in-service training per year. These trainings are organized by DTERT under SSA scheme. Apart from these trainings, the investigator being a mathematics lecturer working in DIET prepared a module and gave training to the teachers for this study. This training will clear the doubts in solving statement problems in class IV mathematics. The training approach will improve the achievement of the students. This training will bring positive
attitude towards the training programme. The teaching-learning materials will change the class room teaching method. Also it will change the classroom environment.

5.8 DELIMITATIONS:

1. The training was given to six primary school teachers of kaveripattinam block in krishnagiri district.

2. The study was conducted for class IV students studying in kaveripattinam block in krishnagiri district.

3. The study was restricted to class IV mathematics.

4. The study was confined to statement problems in class mathematics.

5.9 RESEARCH DESIGN:

Experimental design is the blue print of the procedures that enables the researcher to test hypotheses by reaching valid conclusions about relationships between independent and dependent variables.

Three categories of experimental design are as follows:

[I] pre-experimental design

[2] True experimental design

[3] Quasi-experimental design

5.10 EXPERIMENTAL DESIGN:

Ten Schools were taken for the study. 5 schools were treated as control group and 5 schools were treated as experimental group. Pre-test was
conducted for experimental group and control group. Training was given to the teachers working in experimental group schools. Treatment was given in the beginning of academic year. Teaching-learning material and module were supplied to experimental group schools. Traditional method of teaching was adopted in control group. At the end of the year post-test-1 was conducted for both experimental and control group. To know the consistency of treatment post-test-2 was administered for all the 10 schools after a month gap.

5.11 SAMPLE:

Krishnagiri district has 10 blocks. Sample was selected from 1 block namely Kaveripattinam block. This block is convenient to visit the schools often and the block is an adopted block for the investigator. This block has 107 panchayat union primary schools and 24 panchayat union middle schools. Total schools for primary education in the block is 131. Under SSA scheme, every year census is taken in the schools. According to the census taken in 2005-2006 repetition rate of the schools is considered for selection of sample. Reputation rate varies from 0 to 58.33%. If the repetition rate is low, achievement is high. So high repeaters rate is considered for selection of sample. 10 schools were selected for the study. Randomly 5 schools were taken for control group and 5 schools were taken for experimental group. Educational census is taken by SSA in the year 2003-2004 is considered for selection of sample. The report is given below for the ten schools.
### TABLE 5.1 DETAILS OF FINAL SAMPLE-1: CONTROL GROUP

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name Of School</th>
<th>Total Boys</th>
<th>Total Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Pums Pothapuram</td>
<td>09</td>
<td>08</td>
<td>17</td>
</tr>
<tr>
<td>02</td>
<td>Pups Errahalli</td>
<td>06</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>03</td>
<td>Pups Kallipatti</td>
<td>11</td>
<td>06</td>
<td>17</td>
</tr>
<tr>
<td>04</td>
<td>Pums Nattanmaikottai</td>
<td>18</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>05</td>
<td>Pups Keezpaiyur</td>
<td>08</td>
<td>03</td>
<td>11</td>
</tr>
</tbody>
</table>

**Total 84**

### TABLE 5.2 DETAILS OF FINAL SAMPLE-1: EXPERIMENTAL GROUP

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name Of School</th>
<th>Total Boys</th>
<th>Total Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Pups Sobanoor</td>
<td>08</td>
<td>02</td>
<td>10</td>
</tr>
<tr>
<td>02</td>
<td>Pups Agaram</td>
<td>03</td>
<td>09</td>
<td>12</td>
</tr>
<tr>
<td>03</td>
<td>Pups IV Ward</td>
<td>09</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>04</td>
<td>Pups Avathuvadi</td>
<td>12</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>05</td>
<td>Pums Pannandur IVA</td>
<td>15</td>
<td>11</td>
<td>26</td>
</tr>
<tr>
<td>06</td>
<td>IVB</td>
<td>16</td>
<td>09</td>
<td>25</td>
</tr>
</tbody>
</table>

**Total 116**

Total sample for control group = 84

Total sample for experimental group = 116

Total sample for the study = 200 students
SAMPLE : 2

Teachers handling mathematics for class IV in control and experimental group schools were taken as sample. Total sample is 11 Teachers. 10 female & 1 Male teacher.

5.12 RESEARCH TOOLS:

Three tools were prepared. Two tools were constructed for teachers and one tool was constructed for students.

5.12.1 TEACHER TOOL ON CONTENT & METHODOLOGY:

A tool was developed to know about teachers mathematics knowledge on content and methodology. This tool was constructed and administered for the 11 teachers taking mathematics for class IV. This tool was administered to the teachers before preparing the module. Questionnaire consist of 10 questions each carries 5 mark. Total score is 50 marks. All the questions were taken from the statement problems.
### TABLE 5.3

**BLUE PRINT: TEACHER TOOL ON CONTENT & METHODOLOGY**

<table>
<thead>
<tr>
<th>S.NO</th>
<th>TOPICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Addition of numbers in statement problems</td>
</tr>
<tr>
<td>02</td>
<td>Multiplication and division of numbers</td>
</tr>
<tr>
<td>03</td>
<td>Define: Unitary method</td>
</tr>
<tr>
<td></td>
<td>Solving related problems</td>
</tr>
<tr>
<td>04</td>
<td>Difference between SLM &amp; TLM</td>
</tr>
<tr>
<td>05</td>
<td>Addition of fraction</td>
</tr>
<tr>
<td>06</td>
<td>Subtraction (Measures of capacity)</td>
</tr>
<tr>
<td>07</td>
<td>Teaching method for statement problems &amp; TLM</td>
</tr>
<tr>
<td>08</td>
<td>Measures of mass (Multiplication)</td>
</tr>
<tr>
<td>09</td>
<td>Measures of time (Subtraction)</td>
</tr>
<tr>
<td>10</td>
<td>Explain ABL using example</td>
</tr>
</tbody>
</table>

**CONTENT VALIDITY:**

After construction of the questionnaire some questions were revised with the guidance of experts.
RELIABILITY:

The reliability of the tool was developed by Kuder-Richardson and it was found to be 0.83 which is highly significant.

SCORING:

Each question carries 5 marks. For question number 1,2,5,6,8

Statement----2marks

Calculation----3marks

For question number 3,4,7,9 & 10

Definition-----2marks

Example-----3marks

5.12.2 TEACHER TOOL: IMPACT OF INSERVICE TRAINING:

Tool was prepared to assess the impact of in-service training in the classroom teaching of primary mathematics. This tool was developed to study the attitude of teachers towards training.

Questionnaire consists of 50 items with four alternatives such as strongly agree, agree, disagree and strongly disagree.
SCORING:

For positive items

Strongly agree --- 4marks

Agree --- 3marks

Disagree --- 2marks

Strongly disagree --- 1mark

For negative items:

Strongly agree --- 1marks

Agree --- 2marks

Disagree --- 3marks

Strongly disagree --- 4mark

VALIDITY:

The questionnaire was checked by the experts in relation to its objectivity and suitability. On the basis of the experts opinion some of the items were modified in the questionnaire and the tool was finalised.

RELIABILITY:

Reliability of the tool was found using Kuder-Richardson formula and it was found to be 0.8286 which is highly significant.
5.12.3 ACHIEVEMENT TEST:

The investigator developed a tool to conduct pre-test for the students to know their prior knowledge in mathematics. This tool was developed for class IV. Topic selected for the tool was statement problems involving four fundamental operations. Tool consists of 12 items. Total mark is 50. Question 1,2,6,8 & 9 carries each 3 marks. Question number 3,4,5,7,10,11,12 carries each 5 marks. 3 mark question need only calculations. 5 mark questions need statement and calculation.

VALIDITY:

After framing the questionnaire, the investigator consulted with experienced primary school teachers, teacher educators and the subject lecturers. The tool was modified with the suggestions given by the experts.

RELIABILITY:

The reliability of the tool was developed by Kuder-Richardson and it was found to be 0.87 which is highly significant.

SCORING:

For post-test-1 & post-test-2 slight modifications were made in the pre-test questionnaire.

5.13 DATA COLLECTION:

The investigator conducted pre-test for all the 10 schools using the constructed tool. Traditional method of teaching was done in control group schools. Training was conducted for the teachers working in experimental
schools. Preparation and use of self learning materials were demonstrated in the training program. After the training, module and self learning materials were supplied to the teachers.

Frequent visit was done by the investigator. During school visit doubts raised by the teachers were cleared. Teachers’ comment on the module was satisfactory. Students feel happy to work with the self learning materials. To study the effectiveness of the training post-test-1 was administered to the students. To study the existence of achievement of students, post-test-2 was conducted after a month gap. Post-test 1 &2 was administered simultaneously for control group also. To study the impact of the training to the teachers constructed tool was administered to the teachers.

5.14 SCHEME OF DATA ANALYSIS:

In this study the investigator computed ‘t’ values, Correlation and gain score for the test scores.

5.15 FINDINGS:

- There is no significant difference between the experimental group and control group teachers on content and methodology of IV mathematics. From this it is concluded that both experimental and control group teachers performance is same.

- There is significant difference between pre test and post test scores of experimental group teachers towards impact of in-service training. It is found that the training given to the teachers is effective.
• There is no significant difference between pre-test scores on achievement in mathematics for experimental group & control group students for total sample. It is concluded that the students’ achievement in mathematics is same before the training programme conducted for the teachers.

• There is significant difference between post-test-1 scores on achievement in mathematics for experimental group & control group students for total sample. It is found that the experimental group students scored more than the control group. The treatment given has helped students to improve their achievement in mathematics.

• There is significant difference between post-test-2 scores on achievement in mathematics for experimental group and control group students for total sample. It is concluded that the experimental group students scored more than the control group students.

• It is interesting to notice that the experimental group students’ score in post-test-2 is greater than post-test-1. Impact of training and repeated practice have helped the students for their achievement in mathematics.

• There is significant difference between pre-test & post-test-1 scores on achievement in mathematics for experimental group for total sample.
• There is significant difference between pre test & post-test-2 scores on achievement in mathematics for experimental group for total sample.

• There is significant difference between post-test-1 & post-test-2 scores on achievement in mathematics for experimental group for total sample.

• It is concluded that the high mean score is found in post-test-1 & 2. The methodology adopted in the classroom has desirable impact on the students.

• There is significant difference between pre-test & post-test-1 scores on achievement in mathematics for Control group students for total sample.

• There is significant difference between pre-test & post-test-2 scores on achievement in mathematics for Control group students for total sample.

• There is significant difference between post-test-1 & post-test-2 scores on achievement in mathematics for Control group students for total sample. It is observed that the performance of control group is low compared with experimental group students.

• There is no significant difference between pre-test scores on achievement in mathematics for experimental group boys and girls. It is concluded that the experimental boys and girls do not differ in their achievement in pre-test.
• There is no Significant difference between post test-1 scores on achievement in mathematics for experimental group boys and girls. It is concluded that the experimental boys and girls do not differ in their achievement in post test-1.

• There is Significant difference between post test-2 scores on achievement in mathematics for experimental group boys and girls. It is concluded that the high mean score is scored by girls.

• There is significant difference between pre test and post test -1 scores on achievement in mathematics for experimental group students. It is concluded that the training given to the teacher was implemented successfully in the classroom for all the schools.

• There is significant mean difference between pre test and post test -2 scores on achievement in mathematics for experimental group students. Hence it is concluded that the students’ achievement scores in mathematics has increased because of the training.

• There is no significant mean difference between post test-1 and post test -2 scores on achievement in mathematics for experimental group students except for the schools E3 and E6. It is concluded that the training given to the teachers using module is effective. Methodology applied in the classroom retains the competency. Post test -2 was conducted after a month gap. This shows that the method adopted is
effective and long lasting. For schools E3 and E6, repeated practice increases the post test-2 scores.

- There is significant mean difference between pre test and post test -1 scores on achievement in mathematics for C1, C4 & C5 school students. It is observed that the achievement in schools C1, C4 & C5 may be due to the monitoring of officials and the implementation of trainings attended by the teachers previously.

- There is significant mean difference between pre test and post test -2 scores on achievement in mathematics for control group school students. It is found that the achievement in schools may be due to repeated practice and the in-service trainings taken by the teachers already.

- There is significant mean difference between post test 1 and post test -2 scores on achievement in mathematics for C1, C2 & C5 school students.

- There is no significant mean difference between post test-1 and post test -2 scores on achievement in mathematics for C3 & C4 school students. It is found that the students of school C5 which is located in the urban area scored more than the other schools in all the test. It is of mono-grade type.

- There is significant difference between high achievers and low achievers on post test -1 scores of experimental group. It is found
that the low achievers benefited more than the high achievers. Students understand the competency and they were able to solve statement problems.

- There is significant difference between high achievers and low achievers on post test -2 scores of experimental group. It is concluded that the high mean score is found among low achievers. It is interesting to note that the low achievers gained more than the high achievers in both post test-1 and post test-2.

It shows that the Activity Based Method is effective to teach statement problems.

5.16 DISCUSSION:

In the present study, it is found that the students’ achievement has increased after the implementation of the methodology prescribed in the module. The sample was selected based on the repeaters rate. High repeaters rate leads to low achievement.

Teachers and students cited the following reasons for high repeaters.

- Students do not come to school during harvesting seasons.
- They look after the younger siblings.
- Poverty is the major reason for the absence of students for schools.
- The whole family migrates to city for employment. Even if they leave their child to their relatives, they do not show interest to send them to school regularly.
First generation learner is another problem.
Lack of awareness in education and early marriage are also reasons for repeaters.

A module was prepared and training was given to the teachers of experimental group schools. Pre test, post test-1 and post test-2 was conducted for the students. Following are the teachers opinion about the training and test conducted for the students.

- Students showed interest in doing statement problems.
- They could identify the fundamental operations involved in the problem.
- Students were able to find short cut method to do the operations multiplication and division.
- They feel confidence to do the problem during annual examination.
- It enables the teachers to find out the present status of their students.

In pre test the students have not answered the questions with out statement. They answered only for the questions with statement. In post test experimental group students wrote statement. This shows that the flash cards enable them to frame statement in computing the problem.

5.17 Educational implications:
This study provided a new way of thought in the teaching and learning of mathematics. It also helps to find out the effectiveness of training in the classroom teaching. Teachers not answered for the question on project
method. They are not aware of this method. So training is needed for the teachers in project method. Teachers gave the opinion that they need only limited trainings for the academic year. Instead of giving training for one or two days, duration of training to be increased. Teachers need encouragement from the higher officials and need based training to be given to them.

5.18 SUGGESTIONS FOR FURTHER RESEARCH:

The following suggestions for further research are suggested as a result of this study.

- This study was conducted only with a sample of IV standard students of Kaveripattinam block of Krishnagiri District. Only 10 schools were taken for the study. This study may be conducted for all the schools of that block.

- Present study was conducted for class IV students only. It may be extended to all the primary classes.

- Present study was carried out for statement problems in mathematics only. It can be carried out in other subjects like languages, Science and Social Science also.

- It is also suggested to conduct this study at upper primary level.

- The present investigation did not use the control group for the study, similar study can be conducted with parallel groups.
5.19 CONCLUSION:

Teaching and learning process forms an integral part of Education. The effectiveness of teaching and learning could be measured in terms of achievement. Achievement in a subject involves the involvement of both students and teachers. The environment in the classroom must be joyful. To change the environment the students' participation must be more than the teachers. It is the duty of the teachers to prepare teaching learning material and use it properly while teaching the competency. Students' interaction is mostly needed.

Learning mathematics takes place only when students understand the concept. The researcher conducts in-service training to the teachers but expected achievement is not attained in the schools. To find the causes an experimental study was conducted for IV standard students by the researcher. Activity based learning method was tried to solve statement problems. Training package developed, focus mainly to frame statement for the statement problems by the students. Findings revealed that activity based learning makes students to retain the competency for longer period. Training given to the teachers is more effective. Need based training is expected by the teachers. Impact of training and repeated practice improved the students' achievement in mathematics. Findings also revealed that the low achievers benefited more than the high achievers. Experimental group boys and girls
do not differ in their achievement in post test-1. In post test-2, high mean score is scored by girls.

From this it is found that one of the objectives of SSA is achieved.

This study leads to the conclusion that if the teachers implement the training strategies in the classroom successfully, it is sure to achieve quality primary education. Need based training is to be planned before starting of the academic year. Training is to be given to the teachers before the starting of the academic year. Teachers to be encouraged to implement the training in the classroom teaching. Supervision of classroom teaching by the concerned authorities, their suggestions and encouragement will improve the students’ achievement. Hence it is suggested for the officials to plan conduct and monitor the training periodically. It will enable to attain the objectives of SSA in a specified time.