# CHAPTER-III

# METHODOLOGY

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## 3.1. RESEARCH METHOD

Before starting any work or investigation planning is must which enables the research investigator to proceed in a sequential and systematic way. The present study was **quantitative in nature, quasi- experimental design**. This design employed in the present study was **two group-post-tests only** design with random sample.

The present study involves the study on Effectiveness of co-operative learning on academic achievement in science of class-VII of Keonjhar District, Odisha and the investigator has made an attempt to find out the differences in the Academic Achievement among the students.

Experimental research study requires the construction of two different types of groups for experimentation. Accordingly **control group** (VII-A) and **experimental group** (VII-B) were constituted. The control group was taught in conventional method (5E Model) and the experimental group was taught by applying cooperative learning.

This design is stronger than single group pre-test-treatment-post-test design. In the single group design, the children get exposure to both the methods of teaching, which would affect the effects of the experiment. After gaining knowledge through the literature related to the methods of teaching and the problem under study, the experimental procedure was executed. The Jigsaw Method for cooperative learning was applied to the experimental group.

**Table-3.1: Design of the Study**

| Characteristics | Control Group | Experimental Group |
|---|---|---|
| Early Status | Class-VIIA | Class-VIIB |
| Treatment | 5E Model | Cooperative Learning Method |
| Terminal Status | Post Test | Post Test |

## 3.2. VARIABLES

The present investigation is an attempt to determine the Effectiveness of co-operative learning on academic achievement in science of class-VII students.

The variables involved are:

a) **Independent Variables:** The cooperative learning involved in the teaching of science was taken to be the independent variable in this study.

b) **Dependent Variables:** The achievement test was treated as the dependent variable in this study.

## 3.3. POPULATION

The present study was conducted on class-VII school students of Odisha state. Thus, in the present investigation the population refers to all the students from class-VII studying in Chandra Sekhar English Medium School, Keonjhar.

## 3.4. SAMPLE

The present study is an experimental study concerned with the study of "Effectiveness of Co-Operative Learning on Academic Achievement in Science of Class-VII of Keonjhar District, Odisha." Random sample technique is used for the present study. The researcher selected children of two sections belonging to the seventh standard of CHANDRA SEKHAR ENGLISH MEDIUM SCHOOL, CHAMPUA as sample. It is an English medium school.

Section-A and Section-B were selected as control group and experimental group respectively. There were 24 students each in control group and experimental group. Both the groups were taught by the researcher only.

**Table-3.2: Details of Sample**

| Group | Section | No. of Students |
|---|---|---|
| Control Group | VII-A | 24 |
| Experimental Group | VII-B | 24 |

## 3.5. DATA COLLECTION

The content analysis in the Science Text book for the appropriate application of cooperative learning strategy for the study was done understanding the terminology of 'cooperative learning-based teaching strategies' for instruction. Lesson Plans were prepared for teaching for the application of cooperative learning strategies as well as for the traditional method. Instructional materials for the enhancement of the level of achievement in science among children were developed through cooperative learning strategies. Preparation and validation of tools were made to measure the scores exhibited by the children in science. The students were grouped into two groups with equal number of students (24) namely, the Control Group and the Experimental Group. Further the Experimental Group was sub-divided into four micro groups each contains six numbers of students (4G×6S). The students were taught through two methods. The students of the Control Group were taught through the constructivist method (5E Model) and the Experimental group were taught through the cooperative learning strategies. The duration of the treatment would be Ten days. Post-test was conducted after the completion of instructions through constructivist method for the children of the control group and through cooperative learning for the experimental group students. The post-test scores were entered, categorized and analysed.

## 3.6. TOOLS

Through the review related literature, the investigator identified that the teaching strategies effectively change the pupil's attitude towards science. So, the investigator developed the achievement test to measure the achievement scores. The following tools were used:

- Achievement Test in Science

The Tool was validated by the Supervisor of the study.

## 3.7. ACHIEVEMENT TEST

An achievement test in science was constructed and validated by the investigator, in order to measure the level of achievement in science. The question paper contains one lesson of Science Text book of standard VII. Total number of questions were 30. The test comprised of 30 marks and 30 minutes were given. Test was administered on both the groups.

## 3.8. DEVELOPMENT OF THE TEST

The test covers the chapter "NUTRITION IN PLANTS". Research Supervisor's opinion was taken into consideration while developing the tool.

**Table-3.3: Achievement test Questionnaire**

| S.N. | Type of question | No. of questions | Marks allotted |
|---|---|---|---|
| 1 | Multiple Choice Type | 10 | 10 |
| 2 | Fill in the blanks | 10 | 10 |
| 3 | True or false Type | 10 | 10 |

The test included three types of questions:

a) **Multiple Choice Type-** This part includes 10 questions each carrying one mark.

b) **Fill in the blanks-** This part includes 10 questions each carrying one mark.

c) **True or false Type-** This part also includes 10 questions each carrying one mark.

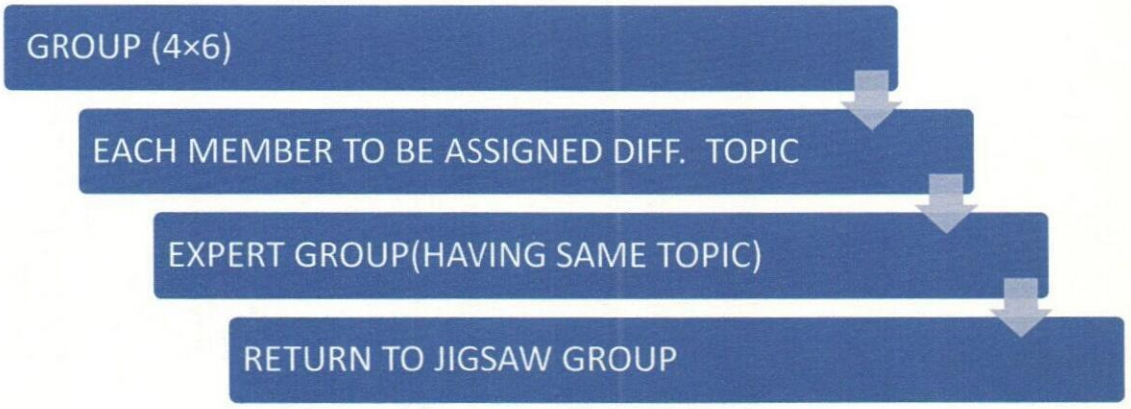
## 3.9. ADMINISTRATION OF THE POST-TEST

After giving the treatment of eight days to the experimental group and the control group, both groups were subjected to the post-test and the scores of the post-test were collected.

## 3.10. PROCEDURE FOR DATA COLLECTION

The present study was conducted in two stages, in the initial stage the instructional material and the tools were prepared and in the final stage implementation on the group of 48 students of class-VII as mentioned earlier from which 24 each for control group and experimental group.

The Experimental group was further sub-divided into four micro-groups each contains six members for smooth implementation of cooperative learning strategy according to **Jigsaw's model.** The lesson was also sub divided into six different topics and assigned to each member to every group. In the very next step, **Expert groups** would be formed by putting all six students having same topic and they had discussed and shared their knowledge among themselves. After discussion all return to their original group and again, they all discussed and gave their inputs regarding their own topics. In this way the whole chapter was completed by using cooperative learning.




On the other hand, same lesson was taught to the control group through the constructivist method on the same day.

The lesson plans for both control group and experimental group and achievement test are provided in the appendix.

## 3.11. STUDENTS' FEEDBACK ON COOPERATIVE LEARNING

The researcher has taken feedback from students about their experience regarding cooperative learning presented in a thematic manner:

- It promotes group work.
- It promotes social inclusion.
- It contributes in character building.
- It develops soft-skills.
- It smoothens Student-Teacher relation.

- It develops self-control.
- It develops good understanding among peers.
- It creates democratic environments.
- It develops leadership quality.
- The students become punctual and disciplined. etc.

## 3.12. STATISTICAL TECHNIQUES

In the present study, the relevant data obtained from the test scores of the post-test was analysed using different statistical techniques.

Mean and Standard Deviation were calculated to determine the central tendencies of the samples and to compare them.

Differential analysis provides inferences involving determination of statistical significance of difference between groups with reference to selected variables. To compare the difference between the means of the small sample, **independent sample t- test** was applied.