

Chapter III

METHODOLOGY OF THE RESEARCH

3.1 INTRODUCTION

The present study aims to find the effectiveness of learning outcomes of standard ninth students. For this purpose, experimental method was selected. Instructional strategy was “Two group only post-test purposive sample design”.

This chapter presents population, sampling technique, the description of the experimental design, tools used, instructional procedure, method of data collection and statistical techniques employed for analysis of the data.

3.2 ORIGIN OF THE STUDY

Initially researcher had gone for literature review of learning outcomes and visited e-content of various university libraries as well as libraries of education departments; Internet resources also provide wide range of the subject. For the study of effectiveness of learning outcomes, researcher advised to work with ICT integrated teaching approach which rely on learning outcomes development. Researcher had studied ICT integrated teaching approach in his Master’s in Education as a part of curriculum. When working on ICT integrated teaching approach in internship programme researcher, find it interesting and helpful for achieving learning outcomes. Guide of the researcher suggested that better to work on topic you are most interested. Researcher had also completed masters in Zoology so it is better to apply Knowledge and understanding of Zoology- content with illumination of ICT integrated teaching strategy. Cell and Its Organisation is a very important basic topic at elementary level science. Cell and Its Organisation is included in Central Board Secondary Education (CBSE), National Council of Educational Research and Training (NCERT) and many other State Board’s Text books including in the sample school taken in the present study. The topic is also

included at bachelor and master levels in Life Sciences in higher education. So, the researcher had decided to apply ICT integrated teaching approach to the teaching of cell in science of standard ninth.

3.3 SELECTION OF RESEARCH METHOD

In the present study of learning outcomes, researcher used ICT integrated teaching approach to the teaching of “Cell and Its Organisation” in science of standard ninth was required to be checked, so experimental research method was necessary to be used. Therefore, the researcher determined to select two groups. Hence, ‘Two groups only post-test design’ of experimental method was used.

3.3.1 Experimental design of the present study

The experimental-design is most important in experimental research work in which conclusions can be derived from the observed data through systematic analysis. Thus, the selection of the experimental strategy was planned systematically. The types of experimental design are (i) Pre-Experimental Design, (ii) True Experimental Design (iii) Quasi Experimental Design and (iv) Statistical Design.

In the present study Two Groups Only Post-test Design is used. In this study effectiveness of independent variable, method of teaching (two levels): (1) ICT integrated teaching method (2) traditional teaching method was required to be checked on dependent variable (achievement), thus the researcher decided to use two groups only post-test.

The present study is conducted on secondary level students of government school to find out the effectiveness of ICT integrated teaching in developing learning outcomes in biological science in secondary level and to compare the learning outcomes through the Integration of ICT in Boys and Girls.

3.4 POPULATION

In any research work, the purpose of the researcher is to find out such conclusion which can be applied universally. The characteristics of the population are to show the marked variations from place to place, and from time to time. Therefore, the researcher has to identify the population, in order to cover the conclusion that is applicable to the population. Students of grade nine of Government High School, Reamal school of Deogarh district, Odisha constituted the population for the present study. Other specifications are:

- 1) Area: Reamal
- 2) Medium of instruction: Odia & English
- 3) Standard: 9th
- 4) Time period: Academic Year 2020-2021
- 5) Gender: Boys and Girls.

3.5 SAMPLE

Sample means, a selected group of subjects from the population which represent the population. The study was conducted by means of the sample. The generalization applicable to the population, for which the sample was obtained, largely depended upon the technique of sampling. In the present study, samples were selected by 'Purposive Sampling Technique'. As the researcher decided to work at the secondary level of school, he selected the sample from standard ninth. The researcher selected the students of standard ninth from the sample schools.

As the present study was experimental one, the researcher had decided to select one school from the population. The researcher selected Purposive Sampling Technique in the selection of school. One school of Deogarh city was selected for the present study: Government High School, Reamal for the experiment. The details of the selected sample are shown in Table-3.1.

Table 3.1

Sample Schools of the Study

Name of The School	No. of Students as Sample of The Study
Govt. High School Reamal, Deogarh	80 (40 Experimental Group+ 40 Control Group)

In Table 3.1 sample school and number of students in the sample is presented. In the experiment 40+40 students were selected in experimental and control group of 9th grade including section A and section B.

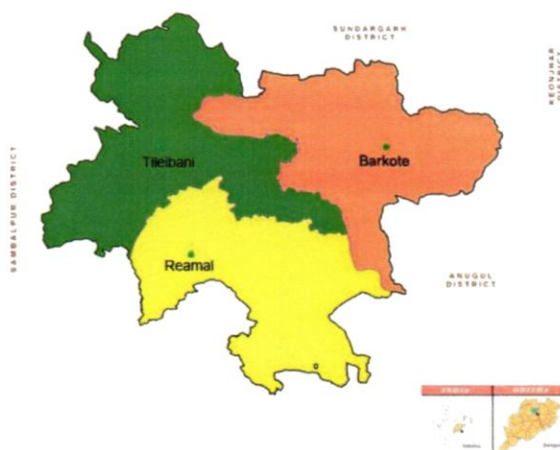


Figure: 3.1

Location of the sample

3.6 TOOLS DEVELOPMENT FOR THE STUDY

Tools are nothing but the instruments that help researcher to gather data. Naturally the type of information depends upon the kind of tools used for the purpose. The selection of tools depends upon the objectives and design of the study, and the type of respondents intended to cover. In order to draw any conclusion from the research, tools used for the measurement of variables should be reliable and valid. This requirement is usually met by employing standardised test.

The aim of the program was to prepare a model for teaching of the chapter “Cell and Its Organisation”. To fulfil this aim, an instructional program is

developed with ICT integrated teaching approach of teaching and learning. Secondly, researcher has to implement ICT integrated teaching model teaching for the teaching of the chapter “Cell and Its Organisation”. And then to compare the effectiveness of ICT integrated teaching model of teaching with traditional teaching model for the study of the learning outcomes of students.

3.6.1 Implementation of Traditional Teaching Model

In traditional teaching group students were taught topics of “Cell and Its Organisation” by traditional teaching method. Traditional teaching program was applied to control group students as per the regular timetable of the school. Traditional teaching program included/ involved Classroom teaching, Practical/Demonstration in the Biology laboratory. The class room teaching was with teacher talk, questioning.

3.6.2 ICT-Based Teaching Methods Used in the Study

Videos have the capability of making a class lively and enhancing the visual memory of learners. Video provides an excellent means of interactive instruction. It is a very flexible medium in teaching new concepts. With these facts in mind, the investigator thought of preparing a video that would cater to the needs of students in the routine classroom setup. It was prepared explicitly relating to the concepts of cell and cellular organelles, their structure and function. Visuals from the internet which portrayed the detailed organisation of cell video was also used. This video was for 15 minutes.

The investigator gained an insight on the experience and opinion of biology teachers in teaching cell organelles concepts. She found that the concepts were difficult for the students to learn. The concepts were varied and the students were confused in differentiating each concept. With this in mind, the investigator felt the need to create a Computer Assisted Instruction package on the concepts of detailed structure and function of cellular organelles. The Computer Assisted Instruction comprised of a "PowerPoint Presentation" that was a slide show with interactive sessions. The investigator has also used multimedia which included charts, flash

cards, and animation for the CAI for providing instruction on the selected content.

The Video and Computer Assisted Instruction were carefully piloted and tested for ensuring accuracy, good vocabulary, and relevance. Flaws were detected and eliminated in this process of testing. Improvements were incorporated wherever necessary. It was also checked that the presentation in the Video and Computer Assisted Instruction package was logically sequenced. The help of subject experts, teacher educators and experienced science teachers was obtained for the process of editing.

3.6.3 Construction of Achievement Test

An achievement test is a test of developed skills or knowledge in a given grade level. Students are regularly examined to demonstrate their learning and proficiency in the subject.

In the present study to study the learning outcomes by ICT integrated teaching model, the researcher measured the achievement of learners with the help of achievement test after completion of chapter. In this regard, the researcher developed an achievement test on the topic Cell of the science subject. To prepare the test, the researcher followed the points such as:

- (1) Deciding the objective of the test,
- (2) Content Analysis,
- (3) Preparing blue print,
- (4) Writing of the test items,
- (5) Expert opinions on the test.

The achievement test was comprised of 50 marks. The questions were based on knowledge, understanding, application, analysis and evaluation. The questions were written in Odia as well as in English language (Bilingual) for better understanding.

3.6.4 Lesson plan

A lesson plan is a teacher's detailed description of the subject matter for a lesson that a teacher is going to deliver in the classroom. A daily lesson plan is developed by the teacher to guide class teaching learning process. For the present study, the researcher has delivered one chapters i.e "Cell and Its Organisation". A total of five lesson plans were made by the researcher.

3.7 METHODOLOGY

The researcher has used experimental design method in which post-test were used to conduct the study. By conducting experimental design method 80 students have given post-test. Post-test was conducted after completion of the chapter.

3.8 PROCEDURE OF DATA COLLECTION

The researcher personally visited the selected school to collect data. Through the permission from the head of the schools, the researcher was able to meet with the students. After establishing a rapport with the pupils, the researcher taken 14 classes and performed the research as per the respective method mentioned above.

The data collection was done basically through achievement test. Achievement test was conducted to saw the learning outcomes in science in both the section of class 9. Section A was control group students and section B was experimental in design where controlled group was taught in traditional teaching while experimental group was taught by ICT integrated teaching method. 50 marks questions included MCQs, fill in the blank questions, label the diagram, match the pair etc. Test was given parallel to both the groups. Tests was evaluated by the researcher and marks were given to each answer paper and the data was collected.

3.9 STATISTICAL TECHNIQUE

Statistic is a body of Mathematical techniques or processes for gathering, organising, analysing and interpreting numerical data. Because most research yields such quantitative data, statistic is a basic tool for measuring evaluating and research. Statistical technique helps the researcher to systematise the observations, description of the characteristics or events for the purpose of discovering the relationships between variables. The various statistical techniques that are employed in the study are:

- i. Mean.
- ii. Standard Deviation.
- iii. T Test

3.10 CONCLUSION

In conclusion, it can be said that research methods are of utmost importance in a research process. They describe the various steps of the plan of attack to be adopted in solving a research problem. Therefore, it is very much essential to adopt a sound and systematic strategy to carry out any investigation effectively.