CHAPTER-3

RESEARCH DESIGN AND METHODOLOGY

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3.1 INTRODUCTION:

The study was undertaken with a view to investigate the "**To study** the **effectiveness of ICT integrated pedagogy on the academic achievement of students of upper secondary level in physics**".

Research design is the conceptual structure within which the research is conducted, it constitutes the both for the collection, measurement and analysis of the data. So we can say that the research design is the plan, structure and strategy of investigation conceived so as to obtain answers to the research questions.

This chapter attempts an exposition of the research design prepared by the researcher for realizing the objectives of present study .The main purposes of this chapter are to:

(1) Describe the research methodology of the study,

(2) Explain the sample selection,

(3) Describe the procedure used in designing the instrument and collecting the data, and

(4) Provide an explanation of the statistical procedures used to analyze the data.

3.2 RESEARCH DESIGN OF THE STUDY

This study is a quantitative research. The method used is experimental method .It is one group pretest posttest deign. Experimental method is found to be more suitable for this type of research work, since the study required the manipulation of the experimental variables.

The Research design of the study is condensed and presented in a schematic form in Table 1

TABLE 1: SCHEMATIC REPRESENTATION OF THE RESEARCH DESIGN

Sl.No.	Type	Sources
1	Nature of Experiment	**QUASI EXPERINMENT** **One group pretest posttest design**
2	Variables	**Independent Variable:** 1.Ict Integration Pedagogy 2.Gender **Dependent variable:** 1. Academic Achievement
3	Tools used	**(a) Self-made Tool:** Achievement Test in Physics (ATP) for measuring the academic achievement.
4	Sample selected for the study	**33 students**
5	Duration of the Experiment	**2 weeks**
6	Statistical Techniques used	**Paired sample t test**
7		

3.3 VARIABLES IN THE STUDY

Dependent Variable

1. Academic Achievement

Independent Variable

1. ICT Integration Pedagogy
2. Gender

Intervening Variable

1. Intelligence   2. Social Statues

3.4 SAMPLING

Population

The population of the study was schools of Pune in urban area. From the population Lexicon Public School from Pune district in a urban area was selected randomly.

Sampling Procedure

1. The sample of the study was the students of Lexicon public school Pune. The sample consists of 33 students of class 9 who were selected randomly which form the pretest and posttest experimental group. From the total sample of 33 students 20 were boys and 13 were girls. Random sampling technique was used in the selection of the sample.

3.5 Construction / Selection of Tools
Instruments

Instruments were used for the collection of data required are as follows

These were **(i) Pre-test (ii) Post-test**

A pre-test and post-test in the subject of physics for class 9th was developed to evaluate the academic achievement of students before and after the completion of the experiment. The researcher made a thorough study for the construction of the test and was developed in the light of test construction technique. Pretest was based on Multiple Choice Item, match the following, fill in the blanks and puzzles items.

1. Pre-test

Pre-test (appendix) in the subject of physics for class 9th was administered before the treatment. The chapter "gravitation" from the 9th class text book of science was selected. The purpose of pre-test was to evaluate the academic performance of students before the experiment. There were 40 questions consist of multiple choice items, match the following, fill in the blanks and puzzles items in the pre-test. Test was checked by giving 1 mark to right answer and no mark was given to wrong answer. There was no negative marking. The total score was 40.

2. Post test

Post-test

After the first weeks treatment (chapter "gravitation" was taught through ict integration pedagogy) a post-test (appendix) was administered. The purpose of post-test was to find out the difference in the academic achievement of the students after the treatment. There were 40 questions consisting of Multiple Choice Items match the following, fill in the blanks and puzzles items in the post test. Test was scored by giving 1 mark to right answer and no marks were given to wrong answers. There was no negative marking. The total score was 40. Result (appendix) of post test was recorded

3.9 STATISTICAL TECHNIQUES USED

i. Paired t-test

The paired t-test (see Student's t-test) is useful for looking at differences in two variables. Paired samples *t*-tests typically consist of a sample of matched pairs of similar units, or one group of units that has been tested twice (a "repeated measures" *t*-test). Paired samples *t*tests are often referred to as "dependent samples *t*-tests" (as are *t*-tests on overlapping samples). A paired samples *t*-test based on a "matched-pairs sample" results from an unpaired sample that is

Subsequently used to form a paired sample, by using additional variables that were measured along with the variable of interest.[9] The matching is carried out by identifying pairs of values consisting of one observation from each of the two samples, where the pair is similar in terms of other measured variables. This approach is sometimes used in observational studies to reduce or eliminate the effects of confounding factors.

ii. Tabular presentation:

The data collected were presented in tabular form to facilitate easy comparison. Tabular presentation was adopted to compile general characteristics of the sample. In its most general form, tabular analysis includes any analysis that uses tables, in other words, almost

any form of quantitative analysis.

iii. dependent-Sample t-test:

The dependent t-test is an inferential test designed to tell us whether we should accept or reject our null hypothesis. An dependent t-test can be used to compare the mean of one sample

with the mean of another sample to see if there is a statistically significant difference between the two. The dependent-samples t-test (or independent t-test,

3.6 PROCEDURE FOR CONDUCTING EXPERIMENT (TREATMENT)

1. A lesson plan on chapter 'Gravitation' from science textbook of class 9 was prepared without using ict tools. It was total based upon the traditional classroom teaching method like using of chalk, duster and textbook and lecture method. The 33 students of Lexicon public school of Pune were taught with the help of this lesson plan for 3 day and after 3 days the researcher administered self made achievement test as pretest on the students and recorded the score.

2. After the first week a another lesson plan on the same chapter 'Gravitation 'from science textbook of class 9 was made with the help of Ict tools such as h5p tools, videos presentation and student were taught with this lesson plan for 3 days and after 3 days posttest was administered .The researcher evaluated the test and recorded the score.

3.7 DATA COLLECTION PROCEDURE

1. The researcher evaluated the test after conducting the pretest and posttest. One mark was given for correct answer and 0 for wrong answer.

3.8 DATA ANALYSIS PROCESS

1. The self made achievement test was analysis through paired sampled t test (related t test)

The paired sampled t-test, sometimes called the dependent sample t test is a statistical procedure used to determine whether the mean difference between two sets of observations is zero. In paired sample t test each subject or entity is measured twice resulting in pairs of observations.

for short) compares the means between two related groups on the same continuous, dependent variable.