CHAPTER-III
RESEARCH METHODOLOGY

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3.1 Introduction

Research is an art of scientific investigation. It is an honest attempt to examine, observe and analyse a problem or phenomena. It is a formal systematic and concentrated process of carrying out a scientific method of analysis. As it is well known that research is an activity directed towards developing or discovering an organized body of knowledge. Rusk defines research as "A point of view, an attitude of inquiry". George J. Mouly defines research as "A systematic and scholarly application of the scientific method." According to John W. Best, "Research is considered to be the most formal, systematic, intensive process of carrying on the scientific methods of analysis. It involves a systematic structure of investigation, usually resulting in some sort of formal record of procedures and a report of results of conclusions." (Pathak, R.P. 2011)

3.2 Research design

Research design follows the task of defining the research problem is the preparing of the design of the research project, popularly known as —Research Designl. The third step of any scientific research is to prepare a research design. Research design is a mapping strategy which is based on sampling technique. It essentially includes objectives, analysing the data and reporting the findings. Thus research design is a statement of the object of inquiry and how a satisfactory culmination to be effected. A research design is the work before getting the project underway. According to Claire Sellitz (1962) —A Research Design is the arrangement of conditions for collection and analysis of data in manner that aims to combine relevance to the research design is the conceptual structure within which the research is conducted: it constitutes a blue print for the collection, measurement and analysis of data. As such a research design includes an outline of what the researcher will do from writing the hypothesis to the final analysis of the data collected.

3.2.1 Steps involved in research design-

1)Review of related literature

2) Identifying the problem

3) Formulation of hypothesis

4) Identifying the sample

5) Construction of attitude scale

6)Collection of data

7)Analysis of data

8)Reporting the finding

3.3 Research method

Research methods are important to effectively conduct and evaluate an educational program. The decision of selecting an appropriate research methodology depends upon the objectives of the research problem. In the present study the main objectives of the study were to examine the attitude of secondary school teachers towards ICT. To investigate the attitude quantitative method has been used by the researcher.

3.4 Design of the study

3.4.1 Population

The population for the present study is secondary school teachers of. In the beginning of the study researcher decided to take the sample of 150 teachers of 3 district of western Odisha but due to the inconvenience caused by COVID pandemic the researcher decided to limit it to 60 teachers of Nuapada district only.

3.4.2 Sample of the study

The important objective of the study is to know the attitude of secondary school teachers towards ICT. Since researcher comes from Nuapada district, it is decided to select 60 teachers from Nuapada district by random sampling method.

3.4.3 Sample selection

Sample selection depends upon the nature of data and investigation. For selecting the population sample random sampling method was applied.

3.4.4 Tool used in the study

To study the attitude of secondary school teachers towards ICT. Self-developed attitude scale will be designed for the respondents. The investigator constructed the 'ICT Attitude Scale' and standardized the tool by doing pilot study. The Opinionnaire consists of statements with a five-point scale which included 20 statements on five-point scale. Maximum possible score is 100, while the minimum score is 20.

3.5 Development of ICT Attitude Scale

Present study was about the studying attitude towards ICT. For which researcher was decided to study about ICT. In any research tool is the exact way of getting the objective. When in the mind of researcher there were raises questions about any problem then first of all researcher wants the answer of the question. For which researcher hypnotized or assumed about the answer but first he needs to collect the information from target group and for this researcher used the tool. Tool is closely related to the testing or measurement. As per nature of the data, there were many tools or techniques used for gathering data. Tools are selected as per data's complexity, design, administration and interpretation. Sometime researcher finds that existing research tool or techniques doesn't suit for researcher aims, object, and hypothesis that time he may modify, construct or develop his own tool. Now construction and development of tool or techniques are skill full work for the researchers it may depend upon researcher's skill, knowledge and study.

3.6 Writing Items for The Scale

Researcher started to work for construction of theattitude scale of ICT after determining the objectives. The scale was in English language and named it as "ICT Attitude Scale". The 20 items were included various angles of the research subject. All related aspects were covered in the scale; and items cleared the object of the scale about collecting the information related to the ICT for secondary school teachers.

3.7 General Characteristics of ICT attitude Scale:

1. The statement will measure the present attitude scale for ICT for secondary school teachers.

2. The language of the attitude scale's items was simple, clear and directive.

3. Double negative meaning of the statements was avoided.

4. Statements of attitude scale of ICT were taken to contain only one thought in each items.

5. Statements of attitude scale of ICT were arranged in a random order, irrespective of their favourable and unfavourable direction.

6. The items only expressed thought of attitude.

3.8 The Final Scale with Instructions

For present scale researcher has adopted Likert- technique of summative rating. According to the presently adapted Likert method the scoring for favourable statements with positive statements and the scoring of Likert for unfavourable statements with negative statements were having marking as five point scale.

3.9 Scoring of ICT Attitude Scale

The positive statements are 1, 2, 4, 5, 7, 10, 11, 14, 15, 16, 18, 20. The Negative statements are 3, 6, 8, 9, 12, 13, 17, 19. For positive statements the weightages for Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree. On the hand negative statement the weightages for Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree respectively. Thus, the score will range between 20 to 100. High Attitude towards ICT is ranging from 20-46 while Moderate Attitude towards ICT is ranging from 47-73 and Low Attitude towards ICT is ranging from 74-100.

Table Number 3.1 Scoring criteria of ICT Attitude Scale

Statements	Items Serial Number	Strongly Disagree	Dis-agree	Un-certain	Agree	Strongly Agree
Positive	1. 2. 4. 5. 7. 10. 11. 14. 15. 16. 18. 20	5	4	3	2	1
Negative	3. 6. 8. 9. 12. 13. 17. 19	1	2	3	4	5

3.10 Statistical Techniques Used for analysis of data

Statistics is the body of mathematical techniques or processes for gathering, describing, organizing and interpreting numerical data. Since research yields such quantitative data, statistics is a basic tool of measurement. Therefore for the purpose of the study the researcher used the following statistical techniques for analysing the data. They are (i) mean (ii) standard deviation (iii) 't' test.

(i) Mean

$$\text{Mean} = \frac{\Sigma x}{N}$$

Where x = scores of the distribution

N= number of scores

Σ= The symbol of summation

(ii) Standard deviation

$$\sigma = c\sqrt{\frac{\Sigma fd^2}{N} - \left(\frac{\Sigma fd}{N}\right)^2}$$

Where σ= standard deviation

C = Class interval

F = frequency

d = deviation from the mean

N = Total frequency

(iii) t-test:

't' test is used to find out the significance of difference between the means of different variables for different subgroups.

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

Where M_1 = mean of the first group

M_2 = Mean of the second group

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N_1 = Size of the first group

N_2 = Size of the second group

σ_1 = Standard deviation of the first group

σ_2 = Standard deviation of the second group

Hence the investigator has fixed *5%* to find out whether there are any significant difference among more than two sets of variables.

3.11 Conclusion

In this chapter hypotheses are listed. The details of the sample, tools, method of administration and scoring of the tools have been described. The next chapter focuses on Data Analysis.