Chapter 3

RESEARCH METHODOLOGY

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3.1 Research Design

Planning is the foundation upon which the superstructure of any research study is based. A plan is the practical view of the expectations. “Research design is the glue that holds all the essentials in a research project together and it is overall plan for organizing a scientific investigation” (Polit and Beck 2004). Research design consist of advance planning, methods to be adopted for collecting the relevant data and the technique to be used for their analysis keeping in view of the research objectives. Research design is a framework to be followed in order to find the answers to research questions in a re-searchable, valid, and reliable method. It provides a structure for the research. According to Green & Tull, a Research design is a pattern for a research project to state how the data could be gathered and processed. Thus, it is a blueprint for collecting and analysing data for the research. It includes vital parameters like what, how, from where, time duration, by which way the data needs to be collected.

3.1.1 Research Design of the Present Study

The present study used a mixed methodology integrating both qualitative and quantitative approaches. Mixed method is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches for the broad purpose of breadth and depth of understanding and corroboration (cited in Tashakkori and Teddlie,2010). It is the combination of applying qualitative and quantitative techniques in a single research study (Mangaleswaran,2011). It is believed that whenever the combination of various research types is used, results would add depth to the data analysis and thus, bring out wiser results (Patton, 1990). The combination of two different methods can create a synergistic research project where by one method enables the other to be more effective, and, together both methods provide a fuller understanding of the research problem.

Survey cum Experimental method was adopted for conducting the present study. For the qualitative part of the study Survey method and for the quantitative part Quasi-Experimental method was adopted.

Experimental design is the blueprint of the procedures that enable the researcher to test the hypothesis by reaching valid conclusions about relationships between independent and dependent variables. The selection of a particular design is based on the purpose of the experiment, the types of variables to be manipulated and the conditions or limiting factors under which it is conducted (Best and Khan, 2007).

For the purpose of the conduct of the experiment, the Investigator analysed the different types of experimental designs. In a true experimental design, the equivalence of the experimental and control groups is made by assigning the subjects randomly to the experiment and control groups. In the present educational situation, it is difficult to organize true experimental designs in the classroom settings, because obtaining the matched pairs by matching person to person is not feasible as the subjects belong to different class divisions in different schools. It is practically impossible to bring them together for the purpose of experimentation as it will disturb the usual class schedules.

The type of research design is a **quasi-experimental research design.** The term, quasi means resembling as it resembles the true experiment format, but still not true in its experimentation format. It is used in situations where a true experiment format is not possible due to various practical, social, and ethical reasons. In this design, the independent variable is manipulated and then it was studied for its cause-and-effect relationship with the dependent variable; thus, it avoids the directionality issue (Cook & Campbell, 1979). The quasi-experimental design has high external validity as they include real life settings and internal validity as it allows control over some variables. This is the best design to study the effectiveness of a particular treatment over a group of people.

The type of quasi-experimental design of research, in the present research is a combination design that is an integration of post-test control group design. In the experimental group, there is a post-test after a treatment. Simultaneously, without the specific treatment, there would be a post-test of the control group. This setup would make a comparison between the experimental group and control group of treatment to know about their improvement. As well as the betterment of both, experimental and control group. The assignment of the group as experimental or control has been done randomly.

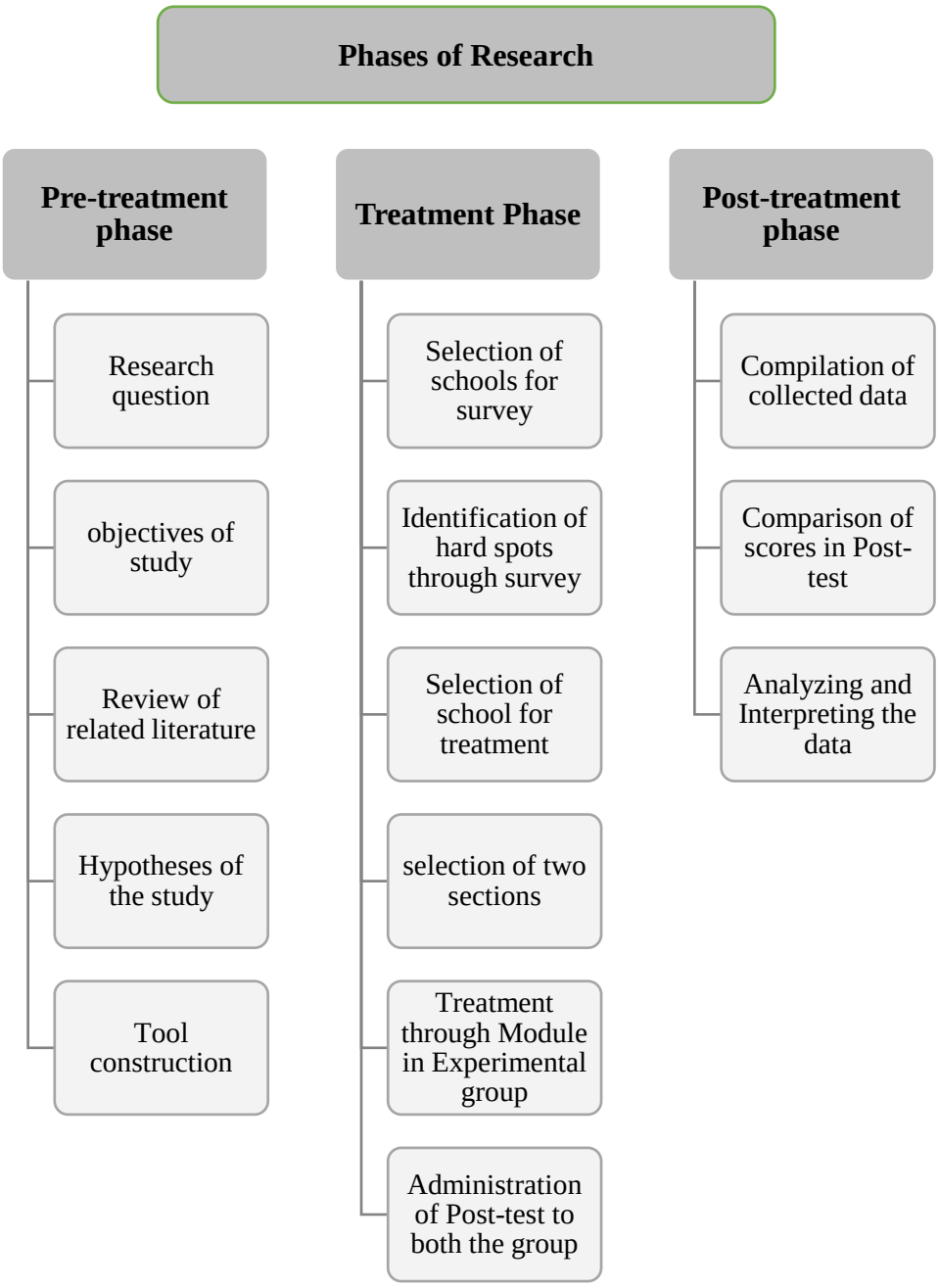

Fig 3.1: Phases of Research in the Present Study

The present study utilizes two groups, one experimental and one control group. The experimental group was exposed to experimental treatment 'Teaching through Module' and the control group was exposed to 'Conventional Lecture Method (CLM)'.

3.2 Variables of the study

Variables are the conditions or characteristics that the experimenter manipulates, controls or observes (Best and Khan, 2007). The present study being experimental, both independent and dependent variables have their own roles.

3.2.1 Independent variable

The independent variables are the conditions or characteristics that the experimenter manipulates or controls in his or her attempt to ascertain their relationship to observed phenomena. In educational research an independent variable may be a particular teaching method, type of teaching materials, a reward, a period of exposure to a particular condition, or an attribute such as sex or level of intelligence (Best and Khan, 2007).

For the present study instructional strategies were selected as the independent variable. These are:

1. Hard spots
2. Teaching through Module
3. Conventional Lecture Method

The strategy of instruction employed by the teacher has very important role in deciding the effectiveness of learning. In the present study two types of instructional strategies are made use of for experimentation. They are Teaching through Module and Conventional Lecture Method. It is assumed that the level of achievement of the pupils in Economics are influenced by the strategies of instruction they undergo. Here all the instructional strategies are likely to influence the dependent variable the achievement in Economics.

3.2.2 Dependent variable

The dependent variables are the conditions or characteristics that appear, disappear or change as the experimenter introduces, removes, or change independent variables (Best and Khan 2007). Here the dependent variable selected was the scores in the achievement test.

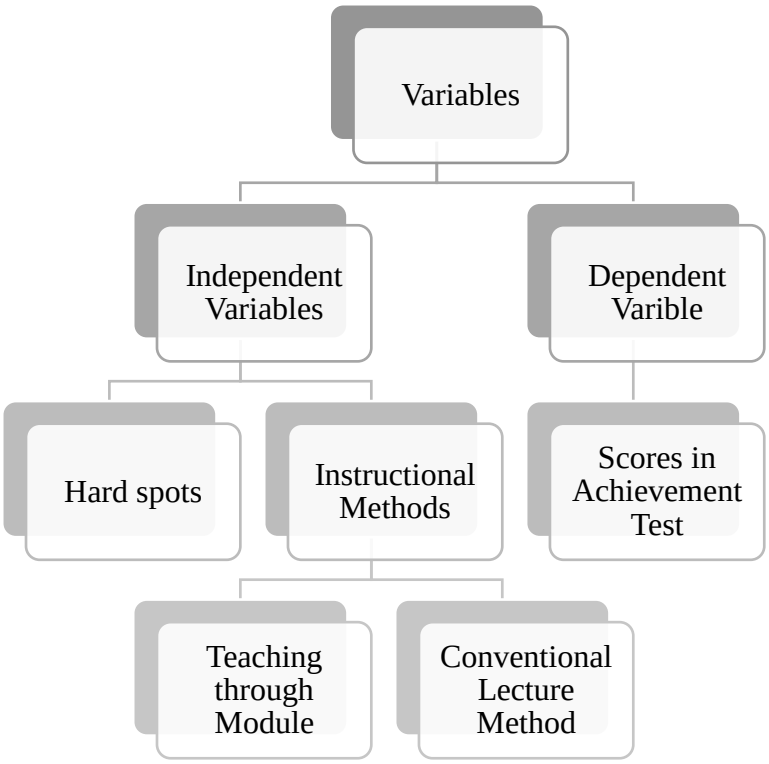

Fig 3.2: Flow chart showing Variables of the study.

3.3 Population

By population, we mean the aggregate or totality of objects or individuals regarding which information are to be made in a research study. A population is any group of individuals that have one or more characteristics in common that are of interest to the researcher. Population is the large group about which the investigator is going to make a study. According to Creswell (2012), population is a group of individuals who have the same characteristic.

3.3.1 Population of the Study

For the purpose of identification of the challenging spots in economics curriculum of class XIth the population includes students of economics of class XIIth and ITEP students and for the experimentation purpose population includes students of economics of class XIth of one the school of the district of Madhya Pradesh.

3.4 Sample of the Study

Sample is the part of population which contains the true characteristics of the population. “A Sample is a small portion of a population selected for observation and analysis. By observing the characteristics of the sample one can make certain inferences about the characteristics of

the population from which it is drawn" (Best and Khan, 2007). It is a collection consisting of a part or subset of the objects or individuals of population which is selected for the expressed purpose of representing the population which provides for generalisation. Generalisation is legitimate if the sample is representative of the larger population. This is an issue of external validity (Miller, 2007).

In the present study, purposive sampling technique was used. As per the method of the present study, the researcher has to teach all the students of both the control and experimental group to eliminate confounding variables and to check on the authenticity of the study. Thus, the school chosen was such that it would be feasible for the smooth conduction of study and collection of data.The sample selected for the present study is described below.

(a) As part of the qualitative study, survey method was adopted. The sample for the survey was 50 students selected by random sampling technique from Bhopal district of Madhya Pradesh. The details of the samples are given below.

Class	Name of School/college	No. of Students selected
XIIth	Subhash Excellence School, Bhopal	20
	Demonstration Multipurpose School, Bhopal	15
ITEP B.A.B.Ed	Regional Institute of Education, Bhopal	15
	Total	50

Table 3.1: Sample of students selected for the survey

(b) The aim of the study was to test the effectiveness of select instructional strategies like Teaching through Module and Conventional Lecture Method on overall achievement of the students. For this quantitative aspect of the study, the students of class XIth were selected as sample for the collection of data. Two groups were formed randomly named control and experimental. Thus, two sections of the XIth standard were chosen as sample. It includes all the students in the respective sizes of the particular school. The study was conducted on 35

students. The groups were formed randomly as XI-B as an experimental group having 18 students as a sample and XI-C as a control group having 17 students included in the sample.

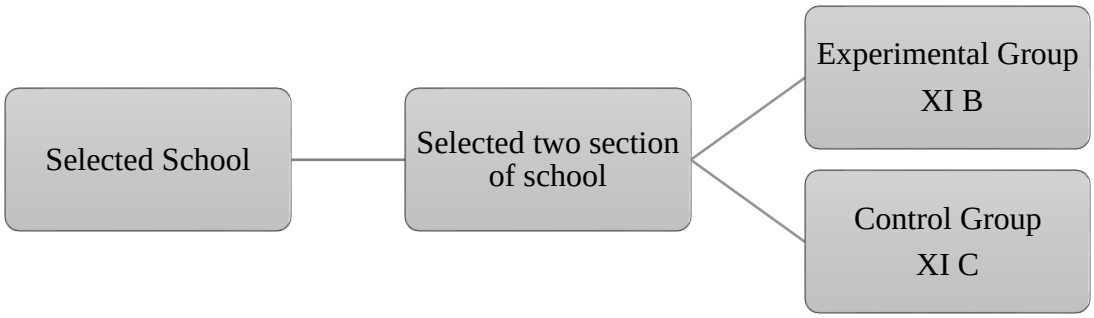

Fig 3.3: Sample selection in present study.

3.5 Description of Tools

The tools were constructed for collecting data and answering the research questions. The tools must be coherent with the objectives. The tools were developed in the study in phased manner. The present investigation was done in five stages. All the stages were planned systematically. A schematic representation of the different phases employed for the study is given below.

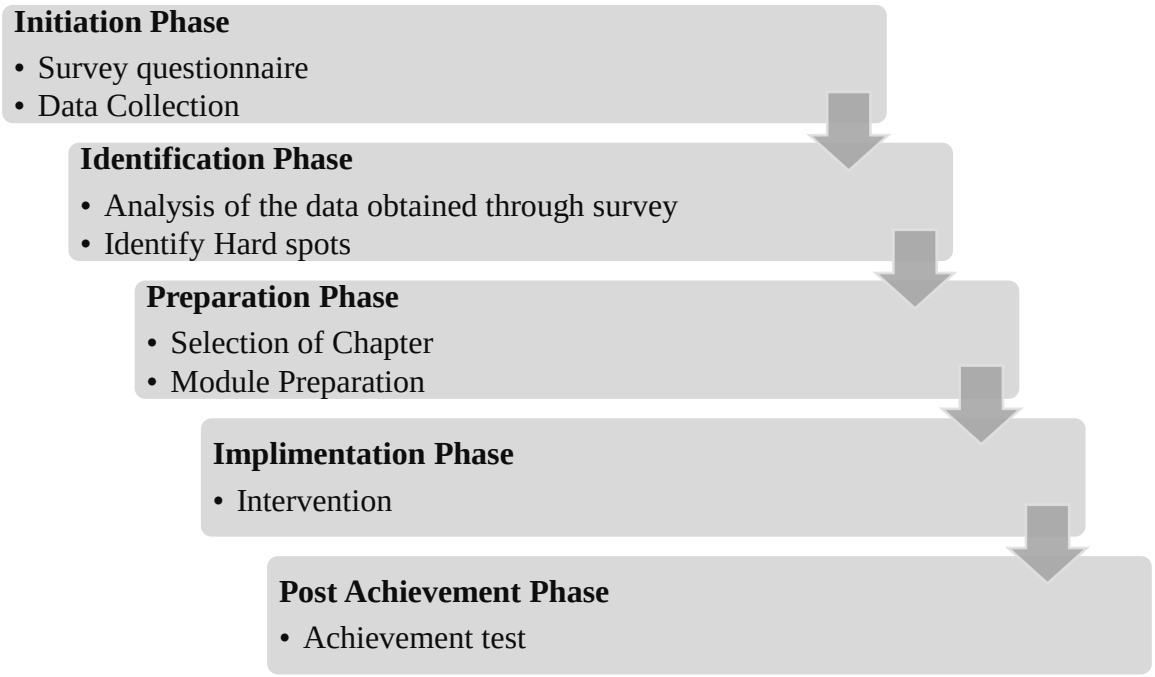

Fig 3.4: Phases of Tools development

Phase 1: Initiation phase

In this phase, the Researcher tried to find out to identify the hard spots experienced by the students in learning class XIth Economics. For this purpose, the researcher made thorough discussion with higher secondary school students. Based on this discussion, the Investigator prepared a questionnaire (with checklist of the chapters) comprising of 10 questions and administered on 50 class XIIth and ITEP B.A.B.Ed students. The questionnaire was designed to understand the opinion and feelings about the hard spots(difficult topics) in learning economics and also try to find out the preferred learning strategies or methods to learn economics according to the students. This survey revealed the gravity of the problem in qualitative dimension.

Phase 2: Identification Phase

In this phase, the Researcher analyse the data obtained in the survey and find out the Hard spots (difficult topics) in learning class XIth economics. Researcher also find some the preferred teaching-learning strategies to address the challenges.

Phase 3: Preparation Phase

In this phase, the Researcher prepared lesson transcripts based on Module developed by researcher for the remediation of the hard spots in learning class XIth Economics. This is done by giving due emphasise to areas identified as 'hard spots' in survey.

Phase 4: Implementation Phase

In this phase, the Researcher has given appropriate treatments to the two groups using the remedial materials prepared concerning the hard spots identified in the survey result. Here experimental group was treated with Teaching through Module (developed by the researcher) and Control group with Conventional Lecture Method.

Phase 5: Post Achievement Phase

After The Implementation Phase, the Researcher administered the Achievement Test as the posttest to both the groups in order to see the effectiveness of the selected strategies namely Teaching through Module with that of Conventional Lecture Method on achievement in learning Economics of the students of class XIth.

3.5.1 Development of Module in the Present Study

For the present study, researcher developed - self developed module, Posttest and survey. All these tools and techniques have been scrutinized and activities which were found to be inconsistent and impractical have been removed. The guide has further verified the final draft of all the tools and techniques.

When the module was ready to get implemented, the researcher visited various schools personally. As per the requirement of the present study, the researcher has to be the one actually teaching in the school. It is to avoid the intervention of various variables that might interfere with the quality of the study. Thus, the researcher applied the module all by themselves in the classroom of the selected school. After finalizing the school, the random chit method has selected for experimental group and control group between two sections of class Eleventh.

Tools and techniques were used in the present study to discover out the answers to research questions and objectives are as follows:

3.5.2 Content Analysis of Economics Textbook

Content analysis of textbook, specifically the Economics class XIth (Micro economics) NCERT textbook in the present study, becomes crucial because it is the first source of information available to students. Though the importance is laid on various pedagogies, strategies, and tools nowadays, the importance of a textbook in a classroom could not be compensated with any such thing. Thus, it becomes important to assess the parameters of a good textbook as it will make the basis of any teaching learning process. The nature of economics and its various components such as scientific attitude, various process skills, linkage between content and the real world, and critical thinking are very important when one needs to understand economics in a true manner. For this understanding to be developed, the inclusion of this nature of social science with its various parameters becomes essential in a textbook. The analysis also helps in the betterment of the teaching and learning process. All the subjects have different and specific pedagogy, so it becomes important to analyse the textbook critically. Every chapter has a different and specific learning outcome. Moreover, it becomes essential for any textbook to fulfill the basic parameters for the transmission of information to the students.

The critical analysis of the textbook might be done unto the following parameters:

- Learning Objective- Not just a unit, but each and every chapter has a different objective. In critical analysis, it is important to check whether the objectives are being achieved or not.

- Relevance- The relevance of the theoretical concepts with the contemporary scenario is important in economics textbook. As economics is a subject that works the best with real life situation, case study. It leads to the development of a society and nation.
- Readability- The readability depicts the reach of a textbook. Few crucial parameters for assessing its readability among masses are vocabulary, accuracy, and text language. The text should be simple and easy to understand. The words chosen should be the one which is used often in that region and the text written should not be contradictory to facts.
- Instructional effectiveness- For a textbook to be well balanced, it has to be checked for its instructional effectiveness, which impacts a textbook upon learners. It becomes crucial for a textbook to maintain a balance between its theoretical and practical content.
- Visual Depictions- The visual depictions in a economics textbook mainly consist of tables, graphs, concept mapping, real photographs and really important is the proper labelling of the diagram. Its presence in the textbook makes the textbook enriched in its outlook. It adds as an attractive feature of the textbook and helps in relating the content with real life by forming a link for the learner.

3.5.3 Achievement Test

Experimental design is often used when there has to be a comparison between two or more groups. Posttest type of design in nonequivalent groups used to study the impact of interventions. In the present study, there is a need to determine the degree of change in a variable in the control and the experimental group. The groups that have been assigned were random and without any bias or preconceived notion. This test was often used when a new methodology of teaching or intervention in the teaching learning process has to be studied. The test also addresses the direction of change and not only its mere presence. Further data analysis determine the implications of the treatment. In Posttest Group Design, both the control and experimental group were tested after the treatment. The respective difference between the posttest of these groups will determine the impact of an intervention in a study. The intervention would be given to the experiment group and not to the control group. This design has many benefits such as:

- Comparison of posttest results between the control and experimental group
- Promotes random group selection for nonbiased study
- Hint about the effectiveness of an intervention

- Study the change in posttest results in terms of its magnitude and direction.

3.6 Tools construction

All the tools were planned, finalized, and constructed only after discussing and continuous brainstorming with the supervisor. The research tools and their items were submitted regularly to the supervisor. The frequent screening of items helped in the refinement and revision of the items. Various drafts of all the tools were made over time, and the final products were adapted for the study.

The main stages for the construction of tools are:

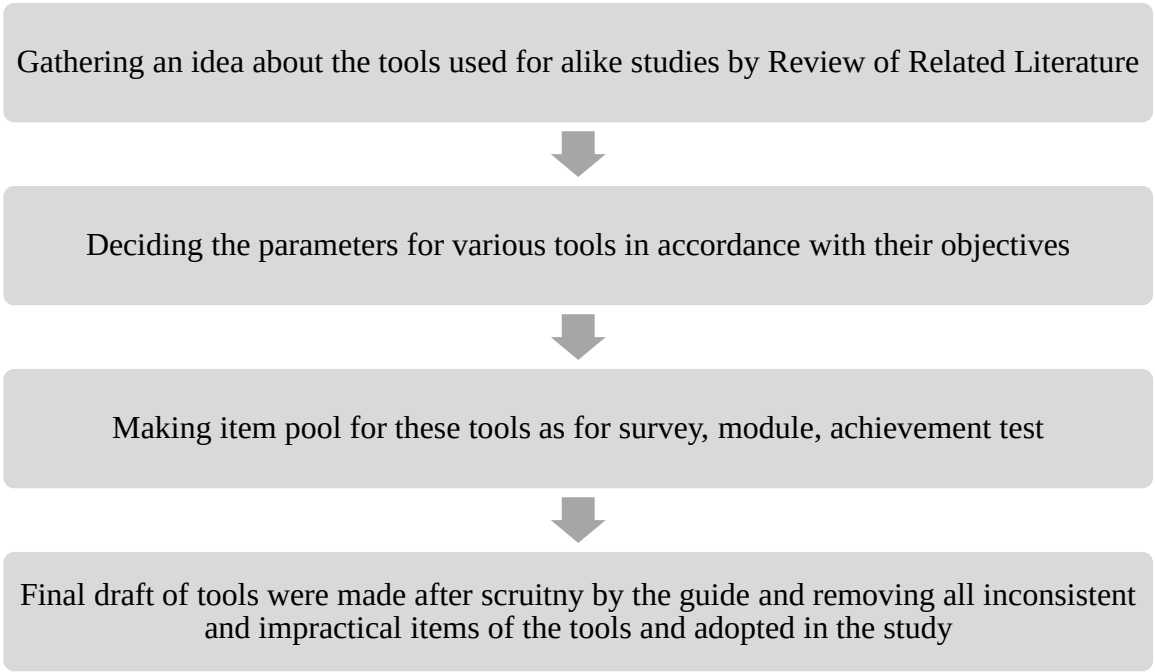

Fig 3.5: Stages of Tools Construction

3.7 Administration of Research Tool and Data Collection

Official permission from the principal of RIE Bhopal were taken before data collection. So that the researcher could go to school with a written form of permission in order to conduct the research. The researcher went to many secondary schools in Bhopal but most of the schools did not entertain some may be because of the exam time is near. Thus, after much struggle, the selected school agrees to entertain and thus, letting the researcher to conduct the study. First of all the survey is conducted among students of the selected school then the Experimental research has been done on the basis of the result the researcher got from the survey. One of the chapters of class XIth NCERT Economics textbook chosen for this study. Then the treatment is

given to the Experimental group for one week in the month of December 2024. At the end of the teaching through lecture method to control group and through the module to experimental group a Post test was conducted. The comparison between the two has been made. Names of the students has not been disclosed due to the matter of confidentiality which is assured to them by the researcher.

3.8 Conclusion

The research design of the study and tools were chosen to make the study authentic and to fulfill the objectives genuinely. The type of the study is mixed type, which covers the study in a wholesome manner. The experimental and control group were taken in their original respective sizes in the study. The tools were as per the objectives and these tools would eventually answers the research questions of the present study. All the tools were made by the researcher in the expert guidance of the supervisor. The tools were designed by the researcher and thus, it is made to best suit the research conditions and variables. The items of tools, which were impractical to do (in the case of module) were removed from the final draft of the tools. The final draft was also shown to supervisor before its adoption in the study. It helped the researcher to be planned in the approach of study, yet be flexible to allow the data to stream in. After the administration of tools, the data was collected and further analyzed to answer research questions and to fulfill the objectives of the present study.