Chapter – IV

Methodology

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4.1 Introduction:

Methodology is a set of practices. This term may be used to refer to practices which are widely used across an industry or scientific discipline, the techniques used in a particular research study, or the techniques used to accomplish a particular project. People may also use the term “methodology” to refer to the study of such methods, rather than the methods themselves.

Having a clear methodology is often deemed important, especially in the sciences. Clearly outlined directions and procedures tend to increase consistency, and to create work which can be repeated elsewhere, which is an important characteristic of rigorous scientific research. This is why the methodology used in scientific research is always described, so that others can replicate the research themselves or identify errors in the methods used which may have created skewed results.

Research has threefold objective: Theoretical, factual and application. These objectives are achieved by employing different methods and strategies of research. A scholar should know the meaning of the term method and strategy of research.

4.2 Meaning and Definition of Method

Method is a style of conducting a research work which is determined by the nature of the problem. M. Varma has defined the term method in the following manner:

“Method is only in the abstract as logical entities that form an organic whole and matter determines method analogously as an objective determines the means and content and spirit determine style and form in literature.”

M. Varma has presented broad meaning of the term method. According to him content is important for determining method. The common type of matter may be three types; hence all the methods can be classified under three heads.

2. Factual problem – Historical, Case study and Genetic method.
4.3 Definition of Strategy

The term research strategy has been defined in the following manner:

“Research strategy is a generalized plan for a problem which includes structure, desired solution in terms objectives of research and an outline of planned devices necessary to implement the strategy. The research strategy is a part of a larger development scheme of research approach.”

The term ‘strategy’ has been borrowed from military science. It refers to the objectives of research. The objectives of research work determine the strategy. A generalized plans for realigning the objectives of known as research strategy. The research strategy is based on the objectives of research, while research method is based on the nature of the research problem. The same method of research may be called as research strategy, if it is determined by considering the objectives of research. In the recent literature research strategy is now being used.

4.4 Types of Research Methods

George J. Mouly has classified research method into three basic types: Survey, Historical and Experimental methods. The meanings and their further classification have been given in the following paras:

4.4.1 Survey Method – It is concerned with the present and attempts to determine the status of the phenomena under investigation. This method has been further classified into four categories:

(a) Descriptive or Normative  
(b) Analytical  
(c) school survey and  
(d) Genetic.

(a) Descriptive survey is of four types-  

a₁ – Testing survey method,  

a₂ – Questionnaire survey method,  

a₃ – Interview survey method.

(b) Analytical survey is of five types-  

b₁ – Documentary frequency,  

b₂ – Observational survey,
**b3** – Rating survey,

**b4** – Critical incident,

**b5** – Factor analysis

(c) School survey

(d) Genetic survey.

### 4.4.2 Historical Method

This method is concerned with the past and which attempts to trace the past as a means for seeing the present prospective.

The historical method can be classified into three types:

(a) Historical (b) Legal (c) Documentary.

### 4.4.3 Experimental Method

It is oriented towards the discovery of basic relationship among phenomenon as means of predicting and eventually, controlling their occurrence into four types as given below:

- **4.4.3.1** Simple experimental designs
- **4.4.3.2** Multivariate analysis
- **4.4.3.3** Case study
- **4.4.3.4** Predictive or correlation

### 4.5 Descriptive or Normative survey:

The present study was conducted by using method of normative survey. The following are the main purposes and uses of this method of research:

Descriptive surveys or normative surveys are often carried out as preliminary step to be followed by researcher employing more vigorous control and more objective methods. Normative survey or studies also serve as direct source of valuable knowledge concerning human behaviour. These studies are helpful for us in planning various educational programme. School surveys are conducted to help solve the problems of various aspects of school i.e. school plants, school maintenance, teaching staff, curriculum, teaching methods, learning objectives etc. That is why researcher had used this method to conduct the present study.
4.5.1 Information which the normative survey methods collect:-

The survey methods of survey studies collect the following three types of information:

The informations are:
- of what exists?
- of what we want?
- of how to get there?

The information of what exist is gathered by studying and analyzing important aspects of present situation. The information of what we want, is obtained by clarifying goods, goals and objectives possible through a study of the conditions existing else where or what experts consider to be desirable. The information of how to get these are collected through discovering the possible means of achieving the goals on the basis of the experiences of other or of opinions of experts.

No category of educational research is more widely used than the type knowledge variously as the survey, the normative survey or descriptive research. Normative or descriptive research is connected with the present and attempts to determine the status of the phenomenon under investigation.

4.5.2 Purposes of or Normative or Descriptive Normative Research

The following are the main objectives of descriptive or normative research:

1. To identify present conditions and point out present needs.
2. To study immediate status of a phenomenon.
3. Fact finding.
4. To examine the relationships of traits and characteristics(trend and patterns)

The normative or descriptive survey is more realistic than experimental research. These researches are oriented towards the description of the present status of a given phenomenon. The present research is also the study of present status of secondary physical science curriculum in Tripura State that is why
researcher has used normative study method to describe the present status of physical science curriculum in Tripura.

4.5.3 Types of Normative or Descriptive Research –

(a) Survey Testing,
(b) Questionnaire Survey,
(c) Documentary Studies

4.5.3(a) Survey Testing

Testing researches are concerned with academic and psychological tests are administrated for data collection. This type of research includes following types of problems.

(i) Selection of test
(ii) Construction of test
(iii) Applicability of test

Characteristics of Survey Testing Research- The following are major characteristics:

1. These researches are relatively more scientific and accurate.
2. It provides more accurate data.
3. The data are subjected to parametric treatment/analysis.
4. The sample is usually of large size the error of measurement and sampling error is put to the minimum.
5. The findings are authentic and accurate.
6. The conclusions are realistic and applicable.
7. It provides the deep insight to the psychometric method of test construction.

Achievement Testing

Survey testing of educational attainment has become a large and well established part of school survey. Achievements test of objective types are constructed for this purpose.

The Personality Testing

Though difficult to define, analyze and measure, they still have given rise to some instruments for survey testing in the field of personality, character and
adjustment which embrace a wise variety of techniques. Questionnaires, interviews observations, check-lists and rating scale as also some carefully pre-arrangement social situations are frequently employed in addition to written tests.

School Appraisal

It is an attempt to measure not the objective characteristics of a school, but the effect of those characteristics on human beings. Appraisal of different aspects of a school is an essential element in school survey. It is concerned with both the objective aspects of an educational institution including its administrative provisions and practices and the educational attainments of its pupils. In other words, it takes account of both static and functional data or conditions and outcomes. To achieve this aim besides attainment tests, a school case render a community a perhaps to compare these services with those that are provided by other schools. The ultimate aim of all schools surveys in educational progress which they achieve by focusing attention on unfulfilled needs or unrecognized evils of a school system on the one hand and on worthwhile practices on the other.

Being large and varied in scope of school survey, a single comprehensive school survey may be contributed by various parts of constituent surveys.

4.5.3(b) Questionnaire Survey

This type of descriptive or normative research uses a questionnaire as research tool for data collection. It is most frequently used in research. Researches of this type are employed for school and educational survey and also for educational administration.

Advantages:- The followings are the main advantages of questionnaire survey research:

1. Among the major advantages of the questionnaire is that it permit wide coverage at minimum expenses of both money and effort. It affords wider geographical coverage. It makes for greater validity in the result through promoting the selection of a large and more representative sample.

2. The validity of questionnaire data also depends in a crucial way on the validity and willingness of the respondents to provide the information
requested. Research has shown that respondents are as a group of superior intelligence.

**Disadvantages:** - The major disadvantage of the questionnaire is the possibility of the misinterpretation of the questions. Misinterpretations are due to the respondent’s willingness or impersonality. Mailed questionnaires are usually impersonal. The reliability of the questionnaire is often ignored.

**The School Surveys**

A school survey generally is a comprehensive study of existing educational conditions undertaken to determine the overall effectiveness of the school programme with a view towards improvement where indicated. In a sense it is a form of accounting or inventory. It gathers information about various aspects of the school programme and evaluates than in the light of objectives of the school. It can be restricted to one specific element or one specific department but in general it is most useful when it is designed to accomplish the school programme. Comprehensive type of school survey covers the following aspects:

1. Aims, outcomes, pupil achievement, curriculum method and instructional aids.
2. Administrative problems and procedures.
3. Financial policies and procedures.
4. Optional and maintenance of the physical plant and related factors.
5. Pupil transposition.
6. Staff and personals.

   (a) **Behaviour Studies** - Centred round measuring such traits and self-reliance, initiative, spontaneity, judgment, cooperation, adaptability, etc., which form no mean goals of education.

   (b) **Attitude Studies** - Centred round the attitudes of the pupils, parents or teachers towards course of study, activities in or out of school, professions and problems, they may encounter.

   (c) **Curriculum Studies** – As part of school survey, the object may be merely to analyse the existing curriculum in a school system and perhaps to compare it with that exiting elsewhere. But if it is carried on as an independent study, it may take a more complicated shape. It may include or analyse the
principles on which the curriculum is based, the needs it’s fulfill, the form it has taken and the shortcomings it suffers from. The relation to the community, it service, may also be determined.

(d) **Building Surveys** – The survey of school buildings for the purpose of planning or just for the sake of information, is not common feature. It usually form parts of comprehensive or wider school surveys. The questionnaire, check list, score cards, observation are the usual tools for collecting data about buildings, their right, and location, the accommodation they provide, the arrangement they have for various classes, subjects activities or staffs, the conditions they are in as regards the construction and cleanliness and the improvement or the whole procedure is however purposive, not mechanical application of steps and techniques.

(f) **Financial Study** – The financial position of school forms an important aspect of school studies. To ascertain the sources of finance, the items of expenditure, the deficit or indebtedness, expenditure per pupil, teacher’s salaries, etc, are the main aspects for the financial study of a school. For this purpose the questionnaires are generally used. The financial study of a school helps, to a great extent, in the status study expansions they stand in need of. These studies too may be independent and complete in themselves or comparative of part of wider school surveys.

4.5.3(c) **Documentary Studies** – A definitely quantitatively type of normative research documentary frequency studies are undertaken to identify and count certain characteristics found in documents under consideration. They deal with a systematic examination of currents records, documents etc and may merely gather and classify data from such documents or may also evaluate the content according to some established criteria.

The documentary studies may serve the following purpose:

- They may describe prevailing practices or conditions.
- They may discover the relative importance or interest in certain topics or problem.
- They may discover levels of difficulty of presentation in textbooks or other publications.
• They may evaluate element of bias or propaganda in text-book presentation.
• They may analyze types of errors in standard’s work.

There sources of data for documentary studies may be:

• Official reports and records
• Printed forms text-books, reference books
• Letters, autobiographies, diaries
• Compositions, themes or other prepared works
• Books, magazines, newspapers
• Colleges bulletins, catalogues, syllabi
• Pictures and cartoons etc.

**Types of Documentary studies** – The following are the main types of documentary studies:

1. Text book analysis,
2. Analysis of longer bodies of literature,
3. Curriculum analysis,
4. Job analysis,
5. Analysis of assembled specimens:
   (a) Vocabulary analysis
   (b) Error studies
   (c) Analysis of characteristics of school records and reports

**4.6. Methodology of Physical Science Curriculum studies in the state of Tripura**

To study the physical science curriculum in secondary level of Tripura in this investigation a survey was conducted for obtaining information from secondary schools, regarding various aspects of the implementation of curriculum

**4.6.1 Sample**

The survey was conducted in Tripura which is one the state of India. Maximum secondary schools in Tripura are organized by State Government both in academically and financially. These schools are operated by State School Education Department and Tripura Board of Secondary
Education. According to School Education Department up to 31st December 2008 there are total 391 secondary schools under TBSE operation and 8584 no of secondary teachers. There are four districts in Tripura so the sample of the study was comprised 10 no of secondary schools in each district, here ten number of schools from each district were randomly selected by researcher from the lists of the schools of each district, which were collected from Director of School Education i.e. total 40 secondary schools and pure science secondary teacher of that schools.

4.6.2 Tools

In order to collect data for the survey in the schools the following tools were used as instruments which had been developed by the investigator himself.

i) School information blank: The name of items under these tools had taken are given below:

(a) Details of the Institution (b) Management (c) Details of the course (d) School Building / House (e) Library (f) Instructional facilities / Physical Science (Physics and Chemistry) Laboratory (g) Manpower (h) Facilities for Science Education (i) Position of the School (j) Curriculum of Physical Science (k) Class room facilities (l) Other information

ii) Questionnaire (Related to teacher): The name of items under this tool has taken are given below:

(a) Text book (b) Teaching Aid (c) Method of teaching (d) Surrounding Problem (e) Manpower (f) Infrastructure (g) Laboratory and Library facilities.

iii) Problem checklist: The name of items under this tools had taken are given below:

(a) Attitude towards Science Education (b) Infrastructure (c) Science Curriculum (d) Surrounding Problems (e) Management (f) Teaching Aids.

iv) Interview schedule: Under this tool 15 questionnaires had taken related with physical science education in secondary level of Tripura.

4.6.3. Data Collection

Having selected the sample and prepared the tools, the next step to be taken was to collect the data from the schools. The researcher personally visited each of the selected schools and gave the questionnaires and checklists
to the teachers of the sampled schools. After two days of the distribution of the tools the investigator again went to the school for collecting the materials and at the same time he himself filled up the school information blank in consultation with the teachers of the sampled schools.

4.6.4 Analysis and interpretation of data

The data for the information aspect of the curriculum for the present study was collected by administering the tools developed by the investigator for the purpose. The analysis of the school information blank, the questionnaire, the problem checklist and the interview schedule have been done separately.

4.7. Conclusion:

It is pointed out that normative survey research designed to secure information on conditions or practices as they exist. The type of information which this kind of research yields is in wide demand, particularly by persons who have practical problems to solve. The method forms a useful supplement to other methods of research in affording knowledge of conditions over a wide area, and the procedures used in gathering data for normative survey purposes are utilized by other research method.

Out of three types of normative survey research survey testing is used to ascertain the general level of a group with respect to school achievement, intelligence, or personality. Survey testing is carried on in large volume both within city school systems and in larger areas by state or regional agencies. Questionnaire inquiries are also frequent and may extend over wide areas. They are adapted both to gathering facts and to gathering opinions and attitudes and have a wide range of application. Documentary frequency studies represent a quantitative analysis of written or printed material by counting the frequency with which specified characteristics occur. The method has received extended use as a basic step in curriculum construction, through analyzing uses or goals, errors or shortcomings. The method affords a survey of what is going on or what has taken place, in the field of written and printed materials, much as the questionnaire does for information and attitudes which may not be expressed in writing.
Normative-survey data are not generally easy to interpret. They require careful evaluation and thoughtful analysis in order that their true significance for practical conclusions may be discovered. A discussion of the construction of appropriate schedules for collecting data has been given in connection with each of the three types discussed, and references have been made to the literature which will be helpful in carrying out the technical details of preparing to undertake research. Typical studies of each kind of research have been cited so that those who are interested may extend their familiarity with the methods to any point desired.
REFERENCES


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