

Educational Research Methods



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In the previous standard you have learnt about research. This year, we will study about research methods and tools for conducting research.

Educational research is done by various methods and is broadly classified under following three headings -

- (1) Research related to the problems in Past.
- (2) Research related to the problems in Present.
- (3) Research related to the problems in Future.

In short the classification is based on time.

7.1 Historical Research Method

7.1.1 Meaning of Historical Research Method

A scientific method that is useful in relevant, real and objective description and analysis of past events, is said to be historical research method.

A method which helps to reveal true identity of history, is called as historical research method.

Basically in historical research method, past events are used as reference for understanding the present events and for anticipating about future.

Past problems are studied in historical research.

e.g., 'Educational thoughts of Mahatma Jotirao Phule'. In this research, educational thoughts of Mahatma Jotirao Phule will be studied. In this study, educational thoughts of Mahatma Jotirao Phule is the main topic of study and data will be collected with the help of primary and secondary sources.

Primary source will include articles written by Mahatma Jotirao Phule, his autobiography, some documents and pictures etc.; whereas secondary sources include a lesson on Mahatma Jotirao Phule in a textbook, his biography, articles in the newspaper, information given in magazines, a movie etc.

Documents which are written by persons who have witnessed the incident and the things that can be directly examined and are used in past are called a primary source. These include documents, relics, pictures and printed material.

Documents which are provided by persons who have not witnessed the event directly but collected information from the person who witnessed the incident, are called secondary sources. These sources include encyclopaedia, textbooks, newspapers, journals, magazines and other reference books.

In historical research, there is no scope for actual observation because researcher is of present state and the events are of past. Hence, he has to collect the information through various secondary sources.



Lets tell

For the research based on 'Educational contribution of Dr. Sarvapalli Radhakrishnan', which primary and secondary sources can be used for collecting information?

7.1.2 Characteristics of Historical Research Method

- (1) In historical research method, collection, description, explanation and evaluation of past events is done.
- (2) In historical research method, support of past events is taken to solve the current problems.
- (3) In historical research, only collection of facts and information is not enough, but a clear picture of past is essential.
- (4) In historical research, though the information is collected newly, the information is already existing.
- (5) In historical research, primary and secondary sources are used for collecting data.
- (6) In historical research all the important evidences are collected, verification of past events is done and the collected data is interpreted fairly.
- (7) In historical research, collection and analysis of information is done simultaneously by the researcher.

7.2 Descriptive Research Method

7.2.1 Meaning of Descriptive Research Method

When the research is related to the problems of present state, it is called as descriptive research.

In descriptive research, the information of present situation is collected and analysed. In this research method, the researcher has to study about various aspects such as abilities, potential, views, characteristics, aptitude, properties, behaviour, similarities and differences of the specific population. Research tools such as rating scale, questionnaire, interview, observation list, sociometric techniques, standardized tests are used for collecting the required data.

Description of current state and its interpretation is done in descriptive research. Descriptive research deals with present status, existing correlations, opinions, ongoing processes, consequences and tendencies.

e.g., to find out the study habits of secondary school students. In this research study habits of students are considered. Tools like rating scale or questionnaire will be used to measure the study habits of the students for collecting the data. The data analysis will be statistically done using percentage or average calculations. The analysed data will be interpreted and conclusion of the research will be drawn. In this way descriptive research method will be used.



Lets tell

'To study the infrastructure available in secondary schools,' which data collection tools will you use for research? Which statistical tools will you use for data analysis?

7.2.2 Characteristics of Descriptive Research Method

- (1) In descriptive research, problems related to present state are solved.
- (2) Data collection is done at large scale.
- (3) Though the sample is huge, data collection is done easily in very short duration.

- (4) In descriptive research, population is very large, but a sample is selected which represents the whole population.
- (5) Descriptive research is qualitative and quantitative. In this research qualitative and quantitative data are analysed and interpreted. Thereafter, on the basis of interpretations, conclusions are drawn.
- (6) Local problems are solved within short duration. In short time span, lot of information is collected and analysed to solve problems.
- (7) Descriptive research is based on scientific method. Scientific method is used systematically to solve the problems in education.
- (8) Descriptive research involves survey, case study and developmental method.



Enlist

Make a list of 10 problems in the field of education which you observe presently.

7.3 Experimental Research Method

7.3.1 Meaning of Experimental Research Method

In school education, we conduct or see the experiments only in science. But like science, experiments are done in social sciences too. Education is a social science.

In the field of education, various aspects like teaching-learning process, the nature of human intellect, memory and methods of study are studied using experimental method. In such experimental studies, observations are made and cause-and-effect relationships are investigated. The effectiveness of activities is examined by implementing the specific type of activities that are implemented. Comparative studies of different methods are carried out and based on all these, conclusions are drawn.

From these conclusions, educational theories are derived and then journey of theory to practical applications begins.

No event can happen without reason. There are many reasons behind every event. Educational research involves study of reasons and consequences of any event.

Like Science, information is collected through various experiments in the field of education. The method of collecting or extracting information through the experiment is called experimental research method.

According to **John. W. Best**, "Experimental research is the description and analysis of what will be or what will occur, under careful controlled condition."

As experiment is the core of this method, so it is necessary to understand, what is experiment?

According to **Chapin**, "An experiment is an observation under controlled conditions." e.g., A teacher decides to study students' achievement by e-learning study material, on the 'digestive system' in science. For the experiment, he divides the students of a class into two groups. Each group has students with similar characteristics (age, gender, intelligence). One group of students is taught digestive system using e-learning material and the other group is taught the same topic with traditional method. At the end of the experiment, both groups are evaluated with respect to their achievement and a conclusion is drawn. In this experiment, the group that is taught by using e-learning materials is the experimental group, and group that is taught by traditional method is the control group. Here the teacher wanted to study the effect of the e-learning study material on the student's achievement. Use of e-learning study material is an independent variable and students' achievement is dependent variable.

The factor whose effect is studied is called the independent variable. A substantial change should be made in this independent variable to study the effect. The factor on which this change is studied is called the dependent variable.



Lets tell

A researcher had two groups of students 'A' and 'B' with the same characteristics. He taught group 'A' with Demonstration method and group 'B' with Traditional method. The topic was 'Properties of Carbon dioxide.' At the end of the experiment, achievement of both groups were measured and conclusion was drawn. In this experiment, which is the control group? Which is experimental group? Which is independent variable? Which is the dependent variable?

7.3.2 Characteristics of Experimental Research Method

- (1) Experimental research method is scientific and logical.
- (2) The effect of one factor on another is studied in this method.
- (3) Accurate observations are important in experimental method.
- (4) In this method, experiments are conducted on a small group of students.
- (5) The size of group of students is decided according to the problem.
- (6) Experimental method is objective, observational, logical and verifiable.

In above three research methods, following steps are used for research :

- (1) Selection of research problem.
- (2) Preparation of research design.
- (3) Preparation of research tools and data collection.
- (4) Classification, analysis and interpretation of collected data.
- (5) Report writing.



Compare it

Compare different research methods based on given points.

Points	Historical Research Method	Descriptive Research Method	Experimental Research Method
• Problems are of which time span?			
• Aim of Research			
• Tools used for data collection			

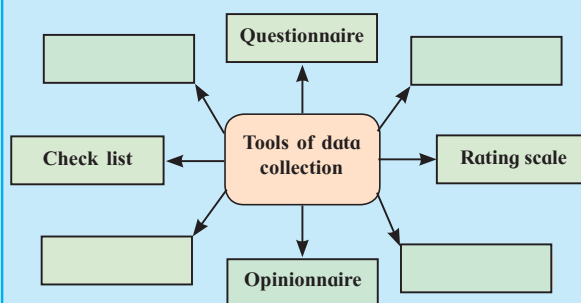
7.4 Tools of Data Collection

In the course of the research work, information is collected to draw conclusions. Information collection means collecting information from the respondents' group according to the research problem. Various techniques and tools are used to collect data in the research.



Complete the table

Complete the following table on the basis of data collection tools used in three methods of research :



Let us learn more about the tools of data collection widely used.

7.4.1 Questionnaire

Questionnaire is used to find out and detect the personal values and beliefs of the people, their past experiences and problems and their current motivations and future plans.

A questionnaire is a method of obtaining answers to the questions, which consists of a collection of questions and the respondent fills the information himself. A questionnaire is a tool, designed to answer questions by various individuals. It includes open and closed ended questions. Based on the open ended questions, the respondents are likely to give their opinions and responses, whereas closed ended questions obtain objective responses.

- **Advantages of Questionnaire**

- (1) Questionnaire can be sent to the persons located in different and distant areas to obtain data from them.
- (2) Researcher assures the respondents to maintain confidentiality of their names and responsibility.
- (3) There is no external pressure while responding.
- (4) The respondents get an opportunity to think over it and respond.
- (5) Decisive answers are obtained.
- (6) Large and wide spread area can be covered.
- (7) Questionnaire is economic.
- (8) As the responses are written, it is easy to verify them.

- **Limitations of Questionnaire**

- (1) It is useful for literate respondent only.
- (2) Conclusions can be adversely affected if respondent gives incomplete and incorrect answers.
- (3) There is no direct contact between researcher and respondent, hence responding to the questionnaire becomes a formality.
- (4) Respondents never respond the questionnaire or send incomplete responses.

7.4.2 Interview Schedule

Respondents are directly contacted to obtain detail information required for research. Interview is face to face conversation between interviewer and interviewee, to obtain valid and reliable information, with the help of questions based on predetermined points. One person or a group can be interviewed. It is useful to keep guideline questions for interview ready but one can add spontaneous questions, if required.

- **Advantages of Interview Schedule**

- (1) Information obtained through interview is deep and detailed.
- (2) As there is a direct contact between interviewer and interviewee, the topic can be discussed in detail and doubts can be cleared immediately.
- (3) Interview is useful to get information regarding the problem from small children or illiterate person, who can not write.
- (4) Well prepared interviewer establishes rapport with respondent and hence detailed information can be obtained regarding the topic or problems.

- **Limitations of Interview Schedule**

- (1) Reaching to every respondent is really expensive.
- (2) Contacting respondents from different locations becomes time consuming.
- (3) Every interviewer may not have knowledge, detail information, communication skills, straight-forwardness, art of creating a favourable environment etc.
- (4) If interviewer decides to record obtained responses at the time of interview, then the conversation stops and gets disturbed. If he decides to record the

responses after the interview, he may forget some responses and hence it is difficult to record all the responses.

- (5) Information obtained through interview may not be quantified.

7.4.3 Achievement Test

Achievement tests are mainly used in experimental research method to measure the acquisition of students' content knowledge. Achievement tests are either standardised or prepared by the researcher. The effectiveness of special teaching methods used in experimental research, is examined on the basis of students' achievements.

• Advantages of Achievement Test

- (1) The achievement test can be administered to many students at a time.
- (2) Achievement test can show how much the students have studied.
- (3) Strength and weakness of students' learnings can be found with the help of achievement test.

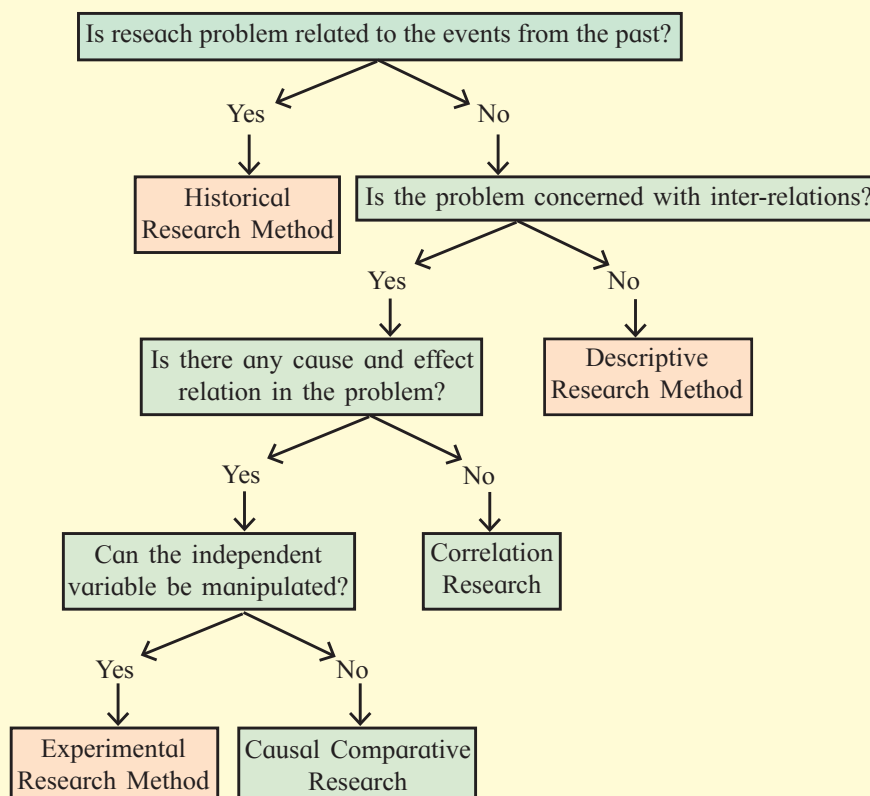
- (4) Effectiveness of teaching method can be verified on the basis of scores obtained in the achievement test.

- (5) Diagnostic evaluation is possible through achievement test, which helps further in remedial teaching.

• Limitations of Achievement Test

- (1) If achievement tests are prepared by researcher and if they are not standardised, evaluation can not be accurate.
- (2) There is no objectivity in evaluation, if questions in achievement test are not of objective type.
- (3) If achievement tests are non-standardised, then data analysis becomes difficult.
- (4) If objective questions are in excess amount, then spontaneity, creativity and reflection are neglected.

How will you select the Research Method?



Q.1 (A) Complete the statements by selecting the appropriate option from the given options.

- (1) A systematic study of the social phenomena carried out by observations in a controlled situation is called the
 - (a) Descriptive research
 - (b) Experimental research
 - (c) Historical research
 - (d) Social research
- (2) The analysis of the data in current situation is done in research method
 - (a) Experimental
 - (b) Descriptive
 - (c) Historical
 - (d) None of these
- (3) More data is collected during short period through reserach method.
 - (a) Historical
 - (b) Experimental
 - (c) Descriptive
 - (d) None of these
- (4) The preplanned list of questions in a sequential order is called
 - (a) Interview
 - (b) Questionnaire
 - (c) Achievement test
 - (d) Sociometric technique

(B) Identify the correct correlation between column 'A' and column 'B' and match them.

Column 'A'	Column 'B'
(1) Historical Research Method	(a) Related to present
(2) Descriptive Research Method	(b) Related to content verification
(3) Experimental Research Method	(c) Related to past
(4) Questionnaire	(d) List of questions
(5) Interview	(e) Related to future
	(f) Face to face interaction

Q.2 Explain the difference.

- (1) Historical Research Method and Experimental Research Method
- (2) Descriptive Research Method and Historical Research Method

Q.3 Write the short notes.

- (1) Historical Research Method
- (2) Advantages of Achievement Test

Q.4 Explain the following in about 50 to 80 words.

- (1) Characterisitics of Descriptive Research Method
- (2) Characteristics of Experimental Research Methods
- (3) Advantages and limitations of the Questionnaire

Q.5 Write the answers to the following questions in 100 to 150 words each.

- (1) Prepare an interview schedule of teachers who have succeeded in achieving 100% result of the school and write advantages and limitations of the interview schedule.
- (2) Write in detail, by which research method will you study the problem related to empowerment of Marathi grammar through language laboratory.

Q.6 State your opinion about the following statements.

- (1) Research is needed to study the phenomenon of past events.
- (2) Questionnaires are more useful tool for data collection.
- (3) More in-depth data collection can be obtained through interviews.
- (4) Research is done scientifically.

Q.7 Complete the following concept designs.

