

Research Methods in Education

1. What are Research Methods?

Research purifies human life. It improves its quality. It is search for knowledge. It shows how to solve any problem scientifically. It is a careful enquiry through search for any kind of Knowledge. It is a journey from known to unknown. It is a systematic effort to gain new knowledge in any kind of discipline. When it seeks a solution of any educational problem it leads to educational research.

Research Methods are ways of getting data ó such as talking to people or reading information on web sites. You are likely to use a variety of Research Methods in your study ó this collection of methods will typically be the middle part of a research Methodology ó earlier parts may be a literature review and later parts data analysis techniques (Note that some prefer to use the term Data Collection Methods for Research Methods).

2. SOURCES OF ACQUIRING KNOWLEDGE:

From the time we were born and the present day, each one of us has accumulated a body of knowledge. Curiosity, the desire to learn about one's environment and the desire to improve one's life through problem-solving is natural to all human beings. For this purpose, human beings depend on several methods / sources of acquiring knowledge as follows:

1. Learned Authority : Human beings refer to an authority such as a teacher, a parent or the boss or an expert or consultant and seek his / her advice. Such an authority may be based on knowledge or experience or both. For example, if a child has difficulty in learning a particular subject, he / she may consult a teacher. Learned authority could also be a book / dictionary / encyclopedia / journal / web-site on internet.
2. Tradition : Human beings easily accept many of the traditions of their culture or forefathers. For example, in matters of food, dress, communications, religion, home remedies for minor ailments, the way a friend will react to an invitation, one relies on family traditions. On the other hand, students, in case of admission criteria and procedures, examination patterns and procedures, methods of maintaining discipline, co-curricular activities, acceptable manner of greeting teachers and peers rely on school traditions. Long established customs or practices are popular sources of acquiring knowledge. This is also known as tenacity which implies holding on to a perspective without any consideration of alternatives.
3. Experience : Our own prior personal experiences in matters of problem-solving or understanding educational phenomena is the most common, familiar and fundamental source of knowledge.
4. Scientific Method : In order to comprehend and accept learning acquired through these sources, we use certain approaches which are as follows:
 - (a) Empiricism : It implies relying on what our senses tell us. Through a combination of hearing and seeing we come to know the sound of a train. i.e. through these two senses, we learn to associate specific sounds with specific objects. Our senses also enable us to compare objects / phenomena / events. They provide us with the means for studying and understanding relationships between various concepts (eg. level of education and income).
 - (b) Rationalism : It includes mental reflection. it places emphasis on ideas rather than material substances. if we see logical interconnectedness between two or more things, we accept those things. For example, we may reason that conducive school / college environment is expected to lead to better teacher performance.

(c) Fideism : It implies the use of our beliefs, emotions or gut reactions including religion. We believe in God because our parents told us though we had not sensed God, seen or heard him nor had concluded that his existence is logically proved.

3. MEANING, STEPS AND SCOPE OF EDUCATIONAL RESEARCH :

4. RELATIONSHIP AMONG SCIENCE, EDUCATION AND EDUCATIONAL RESEARCH :

Science helps to find out the truth behind the phenomenon. It is an approach to gathering of knowledge rather than mere subject matter. It has following two main functions:

- to develop a theory.
- to deduce hypothesis from that theory.

Scientist uses an empirical approach for data collection and rational approach for development of the theory.

Research shows a way to solve life ó problems scientifically. It is a reliable tool for progress of knowledge. Being systematic and methodological, it is treated as a science. It also helps to derive the truth behind the knowledge. It offers methods of improving quality of the process and the product as well. Ultimately, Science and research go hand in hand to find out solution of the problem.

Since Philosophy offers a sound basis to education, Education is considered as an art. However, scientific progress makes education inclining towards a science rather than an art.

Science belongs to precision and exactness. It suffers hardly from any variable. But education as a social science suffers from many variables, so goes away from exactness. Educational Research tries to make educative process more scientific. But education is softening from multivariable, so it can't be as exact as physical sciences. If the study is systematically designed to achieve educational goals, it will be an educational research. Let us summaries this discussion with Good's thought ó "If we wish wisdom, we must expect science. If we wish in increase in wisdom, we must expect research"

Knowledge is educator's need. Curiosity and thirst for search makes him to follow scientific way wisely. Indirectly, he plays a role of educational researcher. Ultimately he is able to solve the educational problem and generate new knowledge. All the three aspects. (Science, education and educational research) have truth as a common basis, more or less, they need exactness and precision while solving a problem.

5. AIMS AND CHARACTERISTICS OF RESEARCH AS A SCIENTIFIC ACTIVITY:

An enquiry is a natural technique for a search. But when it's used systematically and scientifically, it takes the form of a method. So scientific enquiry is also known as Scientific Method.

Bacon's inductive method contributes to human knowledge. It is difficult to solve many problems either by inductive or by deductive method. So Charles Darwin seeks happy blending of inductive and deductive method in his scientific method. In this method, initially knowledge gained from previous knowledge, experience, reflective thinking and observation is unorganized. Later on it proceeds inductively from part to whole and particular to general and ultimately to meaningful

hypothesis. Thereafter, it proceeds deductively from whole to part, general to particular and hypothesis to logical conclusion.

This method is different from the methods of knowledge ó generation like trial and error, experience, authority and intuition. It is a parallel to Dewey's reflective thinking; because the researcher himself is engrossed in reflective thinking while conducting research. Scientific method follows five steps as under :

Identification and definition of the problem: The researcher states the identified problem in such a manner that it can be solved through experimentation or observation.

Formulation of hypothesis: It allows to have an intelligent guess for the solution of the problem.

Implication of hypothesis through deductive reasoning : Here, the researcher deduces the implications of suggested hypothesis, which may be true.

Collection and analysis of evidence: The researcher is expected here to test the deduced implications of the hypothesis by collecting concerned evidence related to them through experimentation and observation.

Verification of the hypothesis: Later on the researcher verifies whether the evidence support hypothesis. If it supports, the hypothesis is accepted, if it doesn't the hypothesis is not accepted and later on it is modified if it is necessary. A peculiar feature of this method is not to prove the hypothesis as an absolute truth but to conclude that the evidence does or doesn't support the hypothesis.

6. ETHICAL CONSIDERATIONS OF RESEARCH:

Research exerts a significant influence over educational systems. Hence a researcher needs to adhere to an ethical code of conduct. These ethical considerations are as follows:

- While a researcher may have some obligations to his / her client in case of sponsored research where the sponsoring agency has given him / her financial aid for conducting the research, he / she has obligations to the users, the larger society, the subjects (sample / respondents) and professional colleagues. He / she should not discard data that can lead to unfavourable conclusions and interpretations for the sponsoring agency.
- The researcher should maintain strict confidentiality about the information obtained from the respondents. No information about the personal details of the respondents should be revealed in any of the records, reports or to other individuals without the respondents' permission.
- The researcher should not make use of hidden cameras, microphones, tape-recorders or observers without the respondents' permission. Similarly, private correspondence should not be used without the concerned respondent's permission.
- In an experimental study, when volunteers are used as subjects, the researcher should explain the procedures completely (eg. the experiment will go on for six months) along with the risks involved and the demands that he / she would make upon the participants of the study (such as the subjects will be required to stay back for one hour after school hours etc.). If possible, the subjects should be informed about the purpose of the experiment / research. While dealing with school children (minors) or mentally challenged students, parents' or guardians' consent should be obtained. This phenomenon is known as informed consent.

- The researcher should accept the fact that the subjects have the freedom to decline to participate or to withdraw from the experiment.
- In order to ensure the subjects' inclusion and continuation in the experiment, the researcher should never try to make undue efforts giving favourable treatment after the experiment, more (additional marks) in a school subject, money and so on.
- In an experimental research which may have a temporary or permanent effect on the subjects, the researcher must take all precautions to protect the subjects from mental and physical harm, danger and stress.
- The researcher should make his / her data available to peers for scrutiny.
- The respondents / subjects / participants should be provided with the reasons for the experimental procedures as well as the findings of the study if they so demand.
- The researcher should give due credit to all those who have helped him / her in the research procedure, tool construction, data collection, data analysis or preparation of the research report.
- If at all the researcher has made some promise to the participants, it must be honoured and fulfilled.

7. Reliability, Validity and Generalizability

Before we look in detail at Research Methods, there are three issues that we need to be mindful of – issues that should be uppermost in a researcher's mind as they design and conduct their research.

Reliability refers to the quality of the methods used. It is a synonym of dependability, consistency and replicability over time and over groups of respondents. It is concerned with accuracy and precision. For research to be reliable it must demonstrate that if it were to be carried out on a similar group of respondents in a similar context then similar results would be found. Reliability is a precondition or *sine qua non* of validity.

Validity is about the quality of data. It is important here to remember that high quality data depends on the accuracy or reliability of the methods used. It is very easy to slip into invalidity as it can enter at every stage of the research from design to data gathering rendering the research invalid or heavily biased. The researcher can take steps to ensure that as far as possible invalidity has been minimized in all areas of the research. For instance at the design stage, through choosing an appropriate timescale and appropriate methodology, and at the stage of data gathering by trying to avoid drop out amongst respondents and minimizing reactivity effects (respondents behaving differently when subjected to scrutiny or being placed in new situations). At the data analysis and data reporting stage one of the main ways of enhancing validity is by avoiding selective use of data.

As the name suggests the **generalizability** of our research refers to how generalized the claims we can make about what our research explores or uncovers. If, for example, our research highlights the importance of reward as a motivator in ensuring good classroom discipline, then to what extent can that claim be applied in general to all classrooms? For the researcher it often means enhancing the potential for generalization by maximizing the range of a sample's characteristics in exploring a particular issue or phenomenon, i.e. to ensure that as many different cases as possible are included in our research.

Note, however, that you don't have to achieve generalizability in your study – what you DO have to do is be aware of and explain how generalizable your results might be. Perhaps what you find may be applicable to others in your school or context, but perhaps not at a different age range or a different part of the world.