

BLOCK

3

EDUCATIONAL RESEARCH AS A PRACTICE

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BLOCK 3: EDUCATIONAL RESEARCH AS A PRACTICE

Block Introduction

Educational research like any other social science research is done through scientific method and involving exploring, analyzing, verifying and even predicting about the knowledge of human behaviour either in the form of extension, modification or reinforcing the existing knowledge or discovering or generating new knowledge. It involves seeking explanations to the unexplained phenomena or discover new relations, new knowledge, new facts or to verify the existing old facts, theories, principles or laws. Educational policy makers, practitioners, leaders, teachers, all take the help of educational research for innovation, creating and improving in educational practices. The present block has focused on concept, types, process and implications of educational research.

Unit 9: Introduction to Educational Research : This unit focuses on meaning, scope and characteristics of educational research. Further it differentiates among fundamental, applied and action researches; between quantitative and qualitative researches. Types of research has also been discussed in this unit.

Unit 10: Process of Research: This unit discusses elaborately the steps of research process -Identifying Research Problem ; Analysing Review of Related Literature; Stating Research Questions, Objectives and Hypothesis; Identifying Research Method/Design (Population and Sample; Research Tools for Data Collection, Statistical techniques used for Data Analysis); Analysing and Interpretation of data.

Unit 11: Understanding Action Research: This unit deals with the concept and characteristics of action research. Further, Unit discusses basic steps involved in action research. Examples of action research and importance of action research in the teacher education programmes has also been discussed in the unit.

Unit 12: Implications of Research for Educational Practices: This unit deals with the role of various types of educational researches for improving educational processes/teaching learning. Unit gives some examples of survey, experimental researches, case-studies, action researches that helps in improving educational/teaching-learning practices. Unit examines the findings of national achievement survey. Unit analyzes the utility of central and state governments' schemes and reports of studies project evaluation.

UNIT 9 INTRODUCTION TO EDUCATIONAL RESEARCH

Structure

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9.1 INTRODUCTION

Have you ever thought about how modern means of telecommunication devices like smart phones, satellite phones, etc are invented? How have tele-communication devices evolved over the centuries? You will find all this is happening because human beings' basic nature of finding or exploring the newer and unexplored areas, situations, etc., and also their need to communicate with their fellow beings, who are residing at a distance from their places, immediately or in the fastest and efficient manner with less time. The journey of telecommunication started in 1792 with the establishment of a telegraph line and today it has reached smartphones. What is the reason behind it? As we all know that human beings by birth are inquisitive. Since their existence on the earth, they are curious about events and phenomena happening in and around them. They want to find out the answers behind the happenings of each event or phenomenon. This inquisitiveness has led them to undertake an inquiry to know and understand a particular event or phenomenon. This process of inquiry sometimes leads to the generation of new knowledge and sometimes already existing knowledge gets verified or validated by others and some other times the existing piece of knowledge is contradicted or invalidated by others. The way the knowledge has been generated has always been a matter of discussion among the people who are responsible for generating

this knowledge.

Charles Pierce, one of the leading American philosophers describes this process that historically there are four ways of generating knowledge i.e. method of tenacity, method of authority, method of intuition, and method of science. The first three methods are haphazard, disoriented, and lack empirical evidence and testing. But, the fourth method is called the method of science. The scientific method is considered the most appropriate and best-known method of generation of knowledge.

Bassey (1999: 38) defines “Research as a systematic, critical and self-critical inquiry which aims to contribute towards the advancement of knowledge and wisdom (as cited in Morrison, (p. 5) Source: https://www.corwin.com/sites/default/files/upm-binaries/9629_017546Ch1.pdf retrieved on 10th July 2020).

The inquiry which follows the systematic process or procedure and involves the generation of a body of knowledge based on empirical evidence which can be validated by others is termed as Research. Education as a discipline has evolved as researchers have been able to generate knowledge in the field. In this Unit, we are going to discuss the concept, meaning, nature, scope, characteristics, and types of educational research.

9.2 OBJECTIVES

After studying this unit, you will be able to:

- explain the meaning of the term educational research;
- describe the scope and characteristics of educational research;
- explain the process or steps involved in the scientific method of research;
- differentiate among fundamental, applied, and action researches;
- give examples of applied and action research from the discipline of education;
- differentiate between quantitative and qualitative researches; and
- list examples of quantitative and qualitative research in the discipline of education.

9.3 EDUCATIONAL RESEARCH

From the introduction given in 9.1, you might have got an idea about the term research. In other words, research is a scientific process of inquiry to generate new knowledge or verify the existing piece of knowledge or contradict the existing piece of information. In the following sections we discuss concept and meaning of educational research and characteristics of educational research.

9.3.1 Concept and Meaning

Educational research consists of two words-education and research. The term ‘Education’ has a wider meaning and it’s very difficult to give one meaning to the word education. But still, the word education is derived from the Latin word Educare which means to mould or shape. In the context of humans, altering

human behaviour as desired by society. On the other hand, the word ‘research’ is derived from the French word ‘recherché’ which means ‘act of searching closely’ or ‘go about seeking’. Therefore, educational research stands for scientific research that tries to alter or shape human behaviour. In other words, educational research is the process of inquiry in the field of education wherein research generates a body of knowledge in the form of law, theory, principles which can be used in general or specific situations for altering human behaviour. Thus, educational research is a systematic process of finding out how and why the behaviour of people changes or modify in educational settings. It not only involves predicting human behaviour in certain situations but also tries to find answers to unexplained behaviour, phenomena or discover new relationships, etc. It tries to seek answers to the causal relations or connections between various human activities.

Before having a clear meaning of the term and coming out with one’s definition, perusal of definitions given by educationists is needed. Below are mentioned a few definitions of educational research :

Ary, Sorenson, and Razaveih (2010) define that “it is the application of the scientific approach to the study of educational problems” (p.19).

“Critical inquiry aimed at informing educational judgments and decisions to improve educational action. This is the kind of value-laden research that should have immediate relevance to teachers and policymakers, and is itself educational because of its stated intention to ‘inform’. It is the kind of research in education that is carried out by educationists” Bassey (1999: 39). (Cited by Morrison, p.8)Source: https://www.corwin.com/sites/default/files/upm-binaries/9629_017546Ch1.pdf retrieved on 10th July 2020)

Creswell (2011) defines that “Educational research involves asking questions, collecting and analyzing data to find out the answers to the questions thus helping the practitioners to understand the problem along with accumulating knowledge. It also assists educators to improve the educational practices and focuses the attention of policymakers on important policy issues to make well-informed decisions on policy matter” (p.26).

Anderson (1998) “Research in education is a disciplined attempt to address questions or solve problems through the collection and analysis of primary data for description, explanation, generalization, and prediction” (p. 6).

Analysis of the above definitions indicates that educational research is a systematic and organized method of finding out the answers for the questions raised and for the problems encountered in the field of education as well as to improve the educational practices of the teachers, educational administrators, managers, institutional heads and other stakeholders or practitioners. It also helps the policymakers and planners to make policies based on it and thus make well informed decisions based on educational policies.

9.3.2 Characteristics

In the previous sub-section, you might have come to know that educational research is a scientific process that follows several steps and contains certain

features or characteristics. The features or characteristics mentioned/highlighted by some of the educational scientists are given discussed below.

According to Anderson (1998) following are the ten characteristics of educational research:

- attempts to solve educational problems;
- involves the collection of data either from primary sources (first hand) or from secondary sources (existing data);
- either empirical or observation-based;
- demands accurate and precise observation and description;
- emphasis is on to develop generalization, theories, principles, etc which will facilitate in understanding as well as prediction of behaviour;
- requires expertise in designing the research, developing the tools, familiarizing with the field, collecting data, collating the data from different sources, and analyzing the data;
- tends to find an objective, unbiased solution to the educational problem and made efforts to validate the procedure employed;
- well directed, deliberate, and unhurried activity and often involves the refinement of the problems or research questions during research;
- always meant for others and that's why it is always carefully recorded and reported;
- conducted or done with well defined procedures and in a rigorous manner.

(Source: Gary Anderson & Arsenault, 1998 p.6-7)

Check Your Progress 1

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

1. What do you understand about educational research?

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2. Enlist three key characteristics of educational research.

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9.4 PURPOSE OF EDUCATIONAL RESEARCH

Research is a purposeful activity that is carried out by the scientific community as the need has been felt by them to seek the answers and solutions to the existing problems faced by mankind. We as humans will never be free from problems, the quest for inquiry continues and so is the case with knowledge

creation and validation. Therefore, it can be said that research serves various purposes, as given below:

Generation of Knowledge: Research helps us verify existing knowledge and, if necessary, generate new knowledge. For example, various theories of learning explain how human beings learn, Behaviourist theory of learning explains how habits can be formed, information-processing theory explains how we process various types of sensation, how we make meaning of them and what role our memory plays, how we store information and how memory is organized. Research that leads to the generation of knowledge is therefore very carefully planned and conducted in controlled situations. Such research is concerned with theory-building and is known as basic research, also called fundamental research.

Problem-Solving: Research is an activity whose main purpose is to solve the existing problems related to education. These problems may be faced by students or teachers or school leaders or parents or any other stakeholders or an educational institution or a community or a nation at large. In education, they may confront a variety of problems e.g. what is the best method of teaching a language? How can children learn skills more efficiently? How can scientific creativity be fostered among children? etc. all these problems involve relatively more effective ways of promoting learning and development. In each of the problems, the researcher's main objective is to find out the solution(s) so that the same can be applied by the others to solve their educational problems. For example, if a researcher did experimental research, use multimedia or ICT to teach a particular subject and get better results than we can generalize that use of multimedia/ICT helps in facing difficulty in teaching a specific subject to a classroom and the teacher as a researcher finds out the solution, then similar solutions could be applied by other teachers to solve their classroom teaching problems.

Action in Specific Situation: Educational research also demands not only finding out the solution of the problem but also expects that solutions should immediately be applied. But applying the solution, researchers should keep in mind the context specificity of the solution. What do you mean by context specificity? Researchers must bear in mind that the nature of the problems may be the same but solutions may not be replicable in totality, therefore one should look into situations and find out the differences, and these differences in the situations demand specific actions/solutions.

Training for future Researchers: Another main purpose of research is to provide knowledge and skills to build the capabilities of young researchers. As we already know research is an activity that is not only scientific but also requires an inquisitive mind, scientific temperament, critical thinking ability, and most importantly carried out in a systematic and organized manner, so personnel to be researchers must be trained in these areas before becoming a researcher. So, good social scientists always train their young researchers on the above-mentioned aspects.

Note: Section 9.4 is adopted from 'Introduction to Educational Research' (Unit-1) in Perspective of Knowledge (Block-1). MES-016. Educational Research , INGOU, 2017

9.5 SCOPE OF EDUCATIONAL RESEARCH

The education discipline has a broad spectrum and subsumes almost all the disciplines. That's why the scope of educational research is not confined strictly to the field of education only but it cut across various disciplines and that's why often educational research is called inter-disciplinary and multidisciplinary. Given below is the diagram showing the scope of educational research.

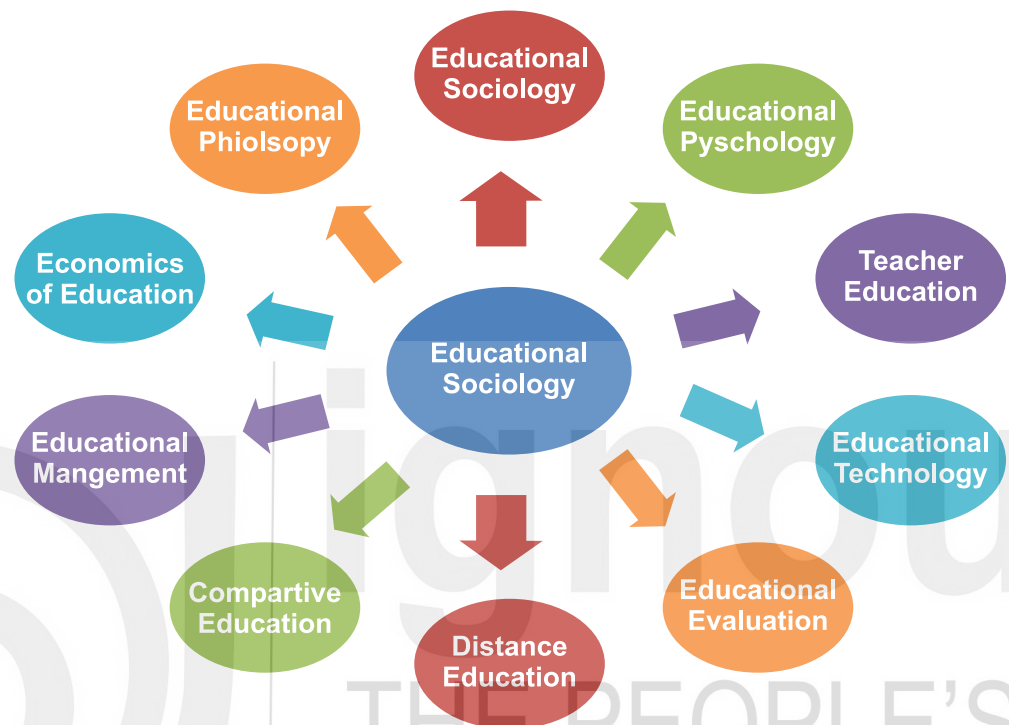


Figure 9.1: Scope of Educational Research

- **Educational Philosophy:** Philosophy is the branch that deals with the search for truth or knowledge. It has a different school of thought propounded by different philosophers in their times. Aristotle, Plato, Swami Vivekanand, Gandhiji, Rabindranath Tagore were some of the known philosophers. Researchers in the field of educational philosophy try to re-investigate the relevance of their thoughts/knowledge in contemporary times, and how far it is relevant in present educational settings.
- **Educational Sociology:** Sociology is the branch that deals with society/communities and their inter-relationships. The educational institutions represent miniature societies, therefore, to study children or learners and their socialization process in their context with peer groups, teachers, and others within and outside the school or educational institutional settings comes in it. Educational Sociology deals with educational problems of specific communities like SC/ST/Minorities/Women vis-à-vis the socio-cultural environment of educational institutions. It also deals with group dynamics of different social groups etc.
- **Educational Psychology:** The branch of psychology wherein researches are done predominantly on the teaching-learning process and its associated concepts to understand the problems of students,

teachers, and others in the field of learning scientifically. It includes cognition and learning, individual differences concerning intelligence, personality, attitudes, aptitudes, motivation etc.

- **Teacher Education:** Educational research deals with problems of teachers (pre-service and in-service) related to the field of professional development, continuing education, capacity building, teaching-learning process, technology-enabled teaching along with issues related to personal, social, and professional roles are studied scientifically.
- **Educational Technology:** In recent years technology has invaded the life of the common man and made it easier for them to do things quickly and efficiently in virtual space. It has impacted education and the educational process tremendously. Online learning has become the buzzword, especially after pandemic lists the whole world. Educational research is going on in the field of techno-pedagogy for reaping the maximum benefits, especially for socio-economically disadvantaged groups.
- **Educational Evaluation:** Educational evaluation has been another area of research that has continuously evolved over the decades. New ways and means of assessment and evaluation of students are being researched which would give accurate and comprehensive information about the performance of students within and outside classrooms. Learning analytics is one of the areas wherein evaluation is used not only to collect information about individual progression in academics but also to provide adequate feedback about the weak areas so that students can work upon their weak areas to excel in the forthcoming evaluation.
- **Distance Education:** Distance education is another area where researches have been conducted and integration of conventional and emerging technologies has revolutionized in terms of reach and impact on the learners. Today student support services coupled with technology have made it possible for online education and support in the form of online pedagogy, implementation of online admission and assessment including regular or on-demand examination, thus facilitated the students irrespective of their place of work or residence and learning both synchronous and asynchronous ways.
- **Comparative Education:** Comparative education is another area of educational research wherein researches are being undertaken to study the education system of other countries or regions and thus help the native countries to improve upon their education systems as per the global or regional standards. This in turn will help the native country to improve their educational governance.
- **Educational Management:** Educational Management and governance/administration are the areas wherein researches are continuously going on especially related to educational leadership, online examination management systems using learning management systems, schemes, and programs of the welfare of various governments so that benefits reach the beneficiaries, so to help policymakers, planners and administrators to make resource allocations and decisions efficiently and effectively.

Check Your Progress 2

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

3. Why do you want to do research? Give any two reasons.

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4. Enlist any three priority areas of research in India. –

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9.6 PROCESS OF EDUCATIONAL RESEARCH

As already discussed above that educational research is a scientific process, therefore educational scientists follow the specified steps to complete research. Following are the steps of educational research:

- **Identifying the Problem:** The first step of research is to identify a problem on which research has to be undertaken. Identification of a problem can be done by searching or going through the existing literature available in the area so that the gaps within it could be identified. It can also be based on your personal experiences or problems faced by certain sections of society.
- **Reviewing the Literature:** This is an ongoing process that starts well before the identification of the problem and goes on till the researcher completes his or her research. In this step, the researcher not only finds out various sources from where the relevant literature related to the problem will be identified but also how it would substantiate the background/ need/justification for the research. Review of literature also finds out the gaps in the existing literature and how the present research carried out by the researcher will fill the gap or how it adds to the existing body of knowledge.
- **Designing a Study:** This step involves the formulation of research questions, objectives, hypotheses along with the design of the research. Researchers must address and try to provide answers to the questions raised by the researchers/ community of researchers/community of practitioners. Normally researchers translate these research questions into smaller objectives as objectives are precise, specific, and measurable. A hypothesis is another part of this step. Researchers formulate/ frame the hypothesis in a statement form which is either to accept or reject the guess or hunch he/she has. This step gives the researcher a clear-cut plan of action i.e. how to research the field or grass root level which includes population, sample and the tools to be used to collect the data. The next step in conducting research is to select the population and then decide

on the sample size (number of respondents you want to consider and the sampling method you want to choose) for the study.

- **Analysis and Interpretation of the Data:** Once the data is collected from the respondents with the help of various tools, data must be classified and organized in a manner to provide meaning. As data itself does not reveal any information until and unless it should be broken down into small parts and rearranging them and represent them in such a manner that it gives meaningful information about the sample and the variables under study.
- **Reporting Research:** Report writing for a research study is a skill and it has a fixed structure within which it needs to be written in the prescribed format and style. While writing a report researchers must be careful about how the results are being presented along with the usage of language. Personal bias and jargon of words have no role in report writing. It should be simple, systematic, comprehensible, organized, and sequential. Figure 9.2 below indicates steps involved in educational research and its interrelation.

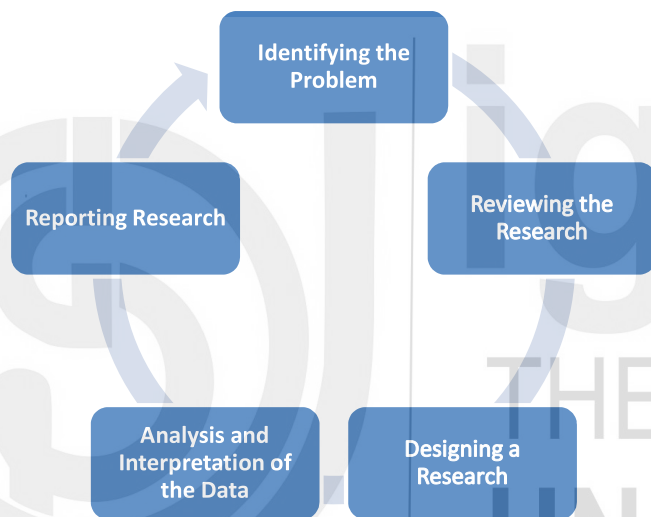


Figure 9.2: Steps of Educational Research

Check Your Progress 3

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

5. Why does a researcher need to do a review of related literature?

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6. List the main steps of the process of education research.

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9.7 CLASSIFICATION OF EDUCATIONAL RESEARCH

You must know the different types of educational research which researchers do in the field. Types of educational research can be classified into two broad categories like – purpose-based research (Fundamental/Basic, Applied and Action Research) and based on types of data (Quantitative and Qualitative).

9.7.1 Purpose Based

Here we will discuss the first type of classification that is purpose-based. As research is all about the generation of new knowledge and using that knowledge for human welfare activity, therefore this type of research can be broadly categorized into three categories: (i) Fundamental/Basic Research (ii) Applied Research and (iii) Action Research. Let us discuss each one of them in detail.

9.7.1.1 Fundamental/Basic Research

Fundamental research is generally carried out for the generation of knowledge without any immediate practical utility or application. It always deals with the generation of new and/or additional knowledge related to an understanding of nature and its laws. These researches are normally done in controlled situations either in the laboratory or laboratory-like conditions. Fundamental researches are done to generate theories, principles, or laws so that applied researchers used these theories, laws or principles, to generate/invent/design various machines, types of equipment, or devices for the welfare of human beings. Fundamental research always adds/modify/corrects the existing body of knowledge.

Since educational researches have immediate utility and education being an interdisciplinary and multidisciplinary area of study, researchers are more applied in nature, therefore researches done in the field of social sciences like psychology, sociology, etc. like learning theories, intelligence theories, personality theories, symbolic interactionism, conflict theory, structuralism functionalism theory, etc. have closely related in many respects. Fundamental researches are being carried out to understand in these allied areas or fields of studies or examples regarding learning theories-how learning takes place in human beings; in intelligence- how to understand the basic human intelligence and how it functions in them; in personality-understanding the personality of human beings and categorized people based on their personality, All these theories from the allied areas of studies help us to understand the social behavior of human beings. Scientists doing fundamental research normally take different perspectives/angles/routes to look at the basic or core problem/issue.

9.7.1.2 Applied Research

We have come to know about fundamental research. The next type of research described is applied research. As already indicated or mentioned, applied research is done by scientists or researchers to solve the immediate or practical problems at hand. Research, carried out all over the world to develop vaccines for the control of coronavirus is an apt example of applied research.

According to Travers *“applied research is undertaken to solve an immediate practical problem and the goal of adding to scientific knowledge is secondary”* (source: cited in Educational Research, SLM Mumbai University, p.6).

The main difference between fundamental research and applied research is that applied research problems are solved in natural settings rather than in laboratory conditions. In applied research, researchers or scientists use the existing laws, theories, and principles of fundamental research to solve their immediate or practical problems in real situations. Take, for example, using the intelligence theories one can identify children with various types of intelligence (numeracy, verbal, reasoning, kinesthetic, spatial, etc) and develop educational programs based on their type of intelligence for their educational enrichment. Applied researches are in a way used to test and verify the theories or laws, principles generated through fundamental research. Thus, applied research is generally carried out to improve the product or process. Applied research helps fundamental researchers to review or formulate new theories. Applied researchers also follow the same steps for conducting the research. As already stated, educational research is more applied in nature and tries to answer questions on what, how, and why, therefore, the practitioners of educational research like teachers, educational administrators, educational leaders, clinical psychologists, social workers, etc. carry out applied research for a dual purpose:

- (i) By addressing their professional problems through systematic inquiry;
- (ii) By developing understanding among the practitioners about using basic or applied research to improve their professional practices.

Educational research is mostly inter-disciplinary as well as multidisciplinary in nature. Therefore, educational researchers or practitioners while dealing with professional problems are not purely confined to education discipline but they do take the help of other disciplines like sociology, psychology, anthropology, management, etc. to understand the problem and seek the solution from different perspectives.

9.7.1.3 Action Research

Action research is diagnostic with the purpose or intent to improve the educational practices of the teachers through a systematic inquiry. Primarily action research is associated with hands-on problems related to teachers, students, school environment, curriculum, assessment, etc. This type of research provides empowerment to the teachers to introspect about the actions, activities that are normally executed on a day-to-day basis related to the teacher's professional and academic journey. It provides an opportunity to teachers to learn and grow in his/her field. The main or stark difference between action research and any other type of research is that solutions are highly local or contextual and specific to the problem and cannot be generalized. Action research usually combines both theory and practice in real educational settings.

Details about action research are discussed comprehensively in unit 11 titled “Action Research” and you may refer to that unit for further reading and comprehension.

Check Your Progress 4

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

7. How action research is different from fundamental research?

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8. Write the similarities between action research and applied research.

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9. Why action research is called classroom research? .

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9.7.2 Data Based

Scientific researches carried out by scientists are either fundamental or applied in nature. These researchers usually study several variables like distance, weight, time, temperature, pressure, volume, force, etc. These variables are not affected by any social environment therefore, their reality hardly changes. In other words, scientific research is highly objective as materials or substances on whom researches are being done in a controlled situation are hardly change their nature or behaviour. To understand it better let's take the example of water. The data collected through scientific instruments regarding its melting point, boiling point, bonding, etc. will yield the same and not yield different results. It means it has specific properties and nature (behaviour) unaltered by the social environment irrespective of whoever is studying water (scientist or ordinary people) and wherever it is being studied (laboratory or outside). Thus, the characteristics of water are universal.

In contrast, in social science research, since the units of study are human beings, therefore their characteristics are not alike. If we want to measure any variables of two human beings, they are bound to be different like emotions, feelings, response to stimuli, etc. But even in social science research too, researchers try to study these variables or the phenomena as objectively as possible i.e., treating the reality of human behaviour as like an object. When such is the case, then the researcher does the study as it is done in the scientific method and collects all the data through instruments in numerical/number form and analyzes all the data with numerical/statistical analysis. This is called 'quantitative research'. When a researcher is interested to understand human behaviour (variables) concerning its social environment which is dynamic and has a constant influence on human behaviour, then such social science researches are called 'qualitative research' as variables are measured/expressed through thick description or treated subjectively.

Researchers normally want to address three basic questions related to research as given below:

- (i) How can the problem be solved?
- (ii) What exactly happens when a given condition or situation exists?
- (iii) Why do some problems or conditions occur?

Based on the nature of research problems and the above-raised questions, it will be decided that research is either qualitative or quantitative. Thus, social science researches can be broadly classified into two categories (i) Quantitative Researches (ii) Qualitative Researches.

9.7.2.1 Quantitative Research

In educational research or any other social science researches, if the social reality (variable) is independent and constant with due respect to time and settings and they can be measured precisely with the help of structured instruments or tools and data so obtained is in numerical form and analyze through statistical analysis, then such researches are called quantitative researches. For example, if we want to measure the achievement of students in any school subject like English, Hindi, Mathematics, Economics through structured research instruments (objective tests) and data so obtained are in numbers and these numbers are given statistical treatment like central tendencies (mean, median and mode), dispersion (range, mean deviation, standard deviation, etc.) then it falls under quantitative research. Similarly, other examples are intelligence in terms of IQ, literacy rate of different states of India (in percentage), monthly income and expenditure of an average Indian family, the employment rate in terms of number and percentage etc.

9.7.2.2 Qualitative Research

Qualitative research involves an in-depth understanding of human behaviour and the reasons that govern human behavior. Unlike quantitative research, qualitative research lies on the reasons behind various aspects of behavior. Simply, it investigates the why and how of decision-making, as compared to what, where, and when of quantitative research. Hence, the need is for smaller but focused samples rather than large random samples. Qualitative research categorizes data into patterns the primary basis for organizing and reporting results. Unlike quantitative research, which lies exclusively on the analysis of numerical data, data for qualitative research comes in much media-including text, sound, images, etc. Largely qualitative research is exploratory, while quantitative research hopes to be conclusive. Examples of qualitative research are: Study the reasons for the poor performance of SC/ST students in competitive examinations, Study the reasons for dropout of girl child /tribal children from schools etc.

So based on the nature of the problem, questions raised by the problem, and nature of data various types of research studies like experimental, quasi-experimental, descriptive, philosophical, historical, etc. can be categorized into two broad categories i.e. qualitative and quantitative studies. Research studies that come under two categories under broad heads are shown in the following table:

Table 9. 1: Classification of Research Studies

Quantitative Research Studies	Qualitative Research Studies
Experimental Studies Quasi experimental Studies Correlational Studies	Descriptive • Survey • Case Studies • Document Analysis • Developmental Studies etc. Ethnographic Historical Philosophical

A brief description of research studies mentioned in table 9.1 is given below:

Experimental Research

Research involves finding out the functional relationship(s) among phenomena under controlled conditions is known as experimental research. Experimental research aims to study the cause-and-effect relationships between two variables. In the process of experimental research, a researcher tries to manipulate or introduce some changes on one variable and observes the consequent changes on the other variable. The variable, which is changed or varied, is known as the ‘**independent variable**’ (IV) while the variable(s) on whom the effect is measured is called dependent **variables** (DV). Problems like “Effect of online teaching on academic achievement of senior secondary school students” are planned through well-designed experimental studies.

Quasi-experimental Studies

The literal meaning of ‘quasi’ is “seemingly, but not really”. Thus research studies that do not use a truly experimental design are called quasi-experimental studies. Since educational research is carried out on human beings who are, unlike objects, changeable, and controls cannot be exercised totally or absolutely, therefore experimental research in education is quasi-experimental. This type of research investigates the same issues that experimental research does. The difference is only in terms of how an experiment is designed and conducted.

Correlational Studies

Correlational research concealed the extent relationship between two variables. For example, if a researcher conducted a study “Relationship between scientific attitude(x) and scientific aptitude(y) of students”, then based on the score of scientific attitude or variable ‘x’ we can predict the score of scientific aptitude or variable ‘y’ and vice versa. Variables may be positively or negatively related to one another.

Descriptive Research

Descriptive research investigates ‘what exists’. It helps in interpreting and explaining the existence of educational phenomena. There are various forms of descriptive research studies like Case studies, Survey Studies.

- **Sample Survey:** A sample survey gathers data on a representative sample.

The data gathered through sample surveys are generalized to the population of the study. For example, research conducted on “Secondary School Teachers attitude towards Blended Learning”. The findings of this research can be generalized as the attitude of all the teachers of secondary schools.

- **Case Study:** This method involves an in-depth, longitudinal examination of a single instance or phenomena, or event. It provides a systematic way of looking at events, collecting data, analyzing information, and reporting the results. As a result, the researcher may gain a sharpened or deep understanding of why the instance happened as it did, and what might become important to look at more extensively in future research.
- **Document Analysis:** Analysis of documents related to a particular aspect/ area of education (e.g. religious and moral instruction, value education, analyzing the education policies and commissions in India, etc;) is known as documentary analysis studies. For example, a researcher wants to compare the existing status of a two-year teacher education program (B.Ed.) and a four-year teacher education programme (B.Sc.,B.Ed) by studying various documents related to both.
- **Developmental Studies:** Descriptive research may examine how various aspects of human development (e.g. intelligence, attitudes, social development, moral development) or skills (cognitive skills, social interaction skills, etc;) develop in groups of individuals of the same characteristics. Such studies are called ‘developmental studies’.

Ethnographic Research

This type of research is just the opposite of experimental research. In the latter, research is conducted through carefully controlled experiments but in ethnographic research, the emphasis is on naturalistic (i.e. totally without control) field studies. Ethnographic studies typically describe events that occur in the life of an educational group or a society concerning social structures and behaviours and perceptions of the individual members. This collects primary data (i.e. facts as they occur) and interprets its meaning. Ethnographic studies use observation as a major technique for data collection. Data collection can be through both participant as well as non-participant observation. Ethnographic studies are extensively used in anthropology, sociology, etc.

Historical Research

Historical research is concerned with the study of ‘what was’; they try to determine, evaluate and understand past events primarily to gain a clearer understanding of the present and a better prediction of the future. Historical research thus seeks to provide a perspective on the past so that we may be able to understand the present and the direction of the course of events in the future. Historical research is useful in understanding the trends and the problems associated with educational developments during a period/time. For example, historical research can also help us understand the rationale or background for the present educational systems like the one, we have today by studying the educational systems that existed in the past in India.

Philosophical Research

Philosophical research studies in education can be taken up under historical research. These studies usually deal with philosophical aspects of education (e.g. related to knowledge and acquiring knowledge), metaphysical (i.e. related

to reality aspects), or axiological (i.e. concerned with values) aspects of the education process. For example: “To study Gandhiji’s Skill Based Education and its Impact on National Educational Policy-2020” or “To Study Educational Philosophy of Shri Aurbindo and its Relevance in the Present Education System.”

Check Your Progress 5

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

10. Suppose you have collected information from your neighborhood about the educational level and monthly income of their houses. Name the type of research used to conduct the study.

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11. Some of the students of a class are unable to understand the content taught by the teacher irrespective of the method of teaching used by the teacher. Name the type of research used to conduct the study.

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12. Write any two differences between quantitative and qualitative research.

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13. What is the main difference between experimental and quasi-experimental research?

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9.8 LET US SUM UP

Educational research is a scientific and applied form of studying a problem or a phenomenon usually carried out in natural settings to solve educational problems. Educational research found its utility in all the allied disciplines of education. That’s why it is both inter disciplinary as well as multi disciplinary in nature. There are a few steps in educational research, which a researcher is supposed to follow while conducting research. The scope of educational research is very vast. Research is broadly classified based on the purpose-fundamental, applied, and action research. Further, educational research can also be categorized based on the types of data collected. If the nature of data

collected from the field is quantifiable or is in numerical form, analysis is done through statistical measures, then research is quantitative. If the data collected is in the form of texts, pictures, images, videos, etc and these are analyzed through a thick description of words, and then the research is called qualitative data. In other words, research is either qualitative or quantitative mainly depending upon the nature of the problem and questions raised by the problem.

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9.10 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

1. Educational research is the applied field of fundamental research that uses theories and validates those theories in natural settings.
2. Three characteristics of educational research: (i) done in natural settings (ii) less control on the human behaviour (iii) Influence of social environment
3. Self exercise
4. Self exercise
5. Review of literature finds out the gaps in the existing literature and how the present research carried out by the researcher will fill in that gap or how it adds to the existing body of knowledge.
6. Identifying the Problem; Reviewing the Research; Designing a Research; Analysis and Interpretation of the Data and Reporting Research
7. Action research is normally carried out to solve immediate practical problems whereas fundamental research is done to add or generate knowledge.
8. Action and applied research both work for finding the solution to the problem.
9. Action research is generally called classroom research as the majority of the problems faced by the individual teachers in their classrooms are solved by teachers only rather than by any social scientist.
10. Quantitative research
11. Qualitative research
12. Qualitative research involves an in depth understanding of human behaviour and the reasons that govern human behaviour. Unlike quantitative research, qualitative research lies on the reasons behind various aspects of behavior. Simply, it investigates why and how of decision making, as compared to what, where, and when of quantitative research
13. Research studies that do not use a truly experimental design are called quasi-experimental studies. Since educational research is carried out on human beings who are, unlike objects, changeable, and controls cannot be exercised totally or absolutely, therefore experimental research in education is quasi-experimental. This type of research investigates the same issues that experimental research does. The difference is only in terms of how an experiment is designed and conducted.

UNIT 10 PROCESS OF RESEARCH

Structure

- 10.1 Introduction
- 10.2 Objectives
- 10.3 Process for Development of Research Plan
- 10.4 Identification of Research Problem
- 10.5 Review of Related Literature
- 10.6 Purpose of Research: Research Questions, Objectives and Hypotheses
 - 10.6.1 Research Questions and Objectives
 - 10.6.2 Hypotheses
- 10.7 Research Design
 - 10.7.1 Research Methods
 - 10.7.2 Techniques of Sampling
 - 10.7.3 Tools for Data collection
 - 10.7.4 Statistical Techniques for Data Analysis
- 10.8 Collection and Interpretation of Data and Findings
- 10.9 Report Writing
 - 10.9.1 References
- 10.10 Let Us Sum Up
- 10.11 References and Suggested Readings
- 10.12 Check Your Progress: Possible Answers

10.1 INTRODUCTION

We discussed in the previous unit titled ‘Introduction to Educational Research’ that research is an organized activity that helps us to generate new knowledge and helps us in validating or testing the existing knowledge. It is also a scientific method of studying a phenomenon or an activity or exploring the world that helps in new knowledge construction and thus supports the progress and development of a society and a nation. Research is a systematic and planned activity and scientific therefore do not believe in isolated facts and unrelated or scattered information. Instead, it seeks to integrate or combine the facts and synthesize a knowledge structure and generate results. Now, the question bothering all of us would be; how does research, as a systematically organized and scientific activity, facilitate solving a problem? The present unit attempts to answer these types of questions. This unit also intends to explain the research as a process, by exploring common questions. Some of the questions are:

- How to identify a research problem?
- What is the significance of research questions in the formulation of research objectives, framing of research hypotheses, selecting a research design, methods to be employed for sample selection, techniques for data analysis,

10.2 OBJECTIVES

After going through this unit, you will be able to:

- explain the concept and process of research;
- differentiate between research questions and research objectives;
- identify the role of research hypotheses in exploring a research problem;
- appreciate the significance of research design in a research process;
- describe the role of sample and sampling in research as a process;
- discuss the importance, need, and techniques of data analysis in a research process; and
- explain the importance of reporting and discussion on the findings in research.

10.3 PROCESS FOR DEVELOPMENT OF RESEARCH PLAN

We are aware that research is a systematic inquiry based on the scientific method and concerned with understanding, prediction, and control of a phenomenon. Educational research follows a scientific method for the systematic study of educational situations. It leads to new knowledge about teaching-learning, educational administration, or any other aspects of education. The goal of educational research is to generate or validate/test the existing knowledge. Since educational research is systematic, there are some basic steps to be followed to conduct a study. Each step is interlinked with other steps and they are given below:

- Identification of a Research Problem
- Review of the Related Literature
- Purpose of Research: Stating or Writing Research Questions, Objectives and Hypotheses
- Design of the Study
- Collection, Analyze, and Interpretation of the Data
- Research Report Writing
- References and Appendices

10.4 IDENTIFICATION OF RESEARCH PROBLEM

The process of research mainly depends on how meaningfully the problem has been identified. So the first step in the research process for an investigator is to identify a problem. Therefore, the first and foremost thought that comes into our mind is, what is the problem? Simply, anything that disturbs an individual is a problem. If a problem cannot be solved, then it is not a problem, similarly, if a research problem cannot be explored by

the investigator or researcher, then it is not a research problem. So, the first prerequisite of a research problem is that it has to be explorable. Research problems must be well focused and pinpointed. Identification of the problem that is focused and pinpointed is not an easy task. Generally, we follow two steps for the identification of a research problem which are as follows:

- Selection of the area
- Delimitation of the problem.

It is necessary for the researcher to first identify a broad area of study in which he/she wishes to conduct a research study. For example, an investigator has to choose whether one wants to study from school education or higher education or any other area concerned with education and then immediately try to explore the available research studies in that area. For this, you as an investigator may visit the institutional libraries to review the related literature available in the area from sources like journals, encyclopedia, books, etc. about the area of study, discuss the problem with other subject experts or explore the online research databases like Google Scholar on the internet. Such efforts help in the delimitation of the problem. Further, it helps in narrowing it down to a specific research problem. By using the following steps you can identify a research problem:

- Identify a broad area that interests you,
- Read the literature you may feel related to the identified area,
- After reviewing the literature narrow the area to 2 or 3 topics,
- Thoroughly examine the literature on the selected 2-3 topics,
- Select a single topic/ problem from the narrowed down 2-3 topics, and
- Write a statement or title of the problem.

To understand the above-mentioned points better, let us take an example. As a researcher, you want to work in the field of science education and you desire to study the advantages or effectiveness of one teaching method or technique in comparison to some other teaching method for science subjects at a particular level of schooling. One teaching method commonly and conveniently in use in our classrooms at the school level is the lecture method and the other one selected for comparison is computer-assisted instruction. Here, the level of schooling is taken as secondary school level. Here you want to see the effect of teaching methods on students' academic achievement, subject-related motivation, and retention. Considering the points discussed earlier, the problem will be written or stated as "To Study the Effectiveness of Computer-Assisted Instruction on Academic Achievement of Secondary School Students in Science".

You can write the same research problem in another way also like - "Effect of Computer Assisted Instruction on Academic Achievement of Secondary School Students in Science."

So, you can formulate the research problem in different ways by taking some other variables.

Check Your Progress 1

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

1. What are the steps to be followed in the identification of a research problem?

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2. Write any two research problems related to the field of education.

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10.5 REVIEW OF RELATED LITERATURE

The literature review is a necessary and integral part of each research and makes a foundation or base to every operational step. It has value even before going to the first step; that is when you are merely thinking about research questions to find answers through research. The initial stages of research review help to establish the theoretical roots for the study, clarify ideas and develop the most appropriate research methodology. Later on during the process, the literature review serves to refine or enhance and consolidate the knowledge base and helps you to integrate findings with the existing body of knowledge. Since an important responsibility of research is to see the relationship or comparison of findings with those of others, it is here that the literature review plays an extremely important role. During the write-up of the report, it helps you to integrate findings with existing knowledge - that is, to either support or contradict earlier research. Concerning your study, the literature review can help in the following ways. It can:

- bring clarity and focus to the research problem;
- provides a theoretical background or rationale to study;
- helps to establish the links between what is proposed or intended to examine and what has already been studied;
- improve or relook at research methodology; and
- contextualize findings.

Generally, you can find and collect the literature from the following sources:

- Internet: on-line systems
- Scholarly journals
- Books containing reports of original research, or collection of research articles
- Theses / Dissertations / Project Reports

- Dissertation Abstract International
- Government documents
- Policy reports and presented papers
- Bibliographic indexes.

In the context of the selected research problem, that has been stated earlier, the concerned literature review may be categorized as (i) educational researches of computer-assisted instruction; (ii) educational researches about science as a school subject; (iii) educational researches about academic achievement in a science subject. You as an investigator can explore certain national and international journals of repute; online repositories like shodhganga, shodhsindhu, etc. This will help in classifying the results and findings and framing research hypotheses. Then you may find or come across that some of the researches display or have mixed or contradictory findings, that is some researchers have reported their results in favour of lecture method in comparison to any other method in question while some other researchers have reported their findings in favour of computer-assisted instruction in comparison to the lecture method.

Check Your Progress 2

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

3. What are the sources for review the related literature?

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4. Why review of related literature is required?

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10.6 PURPOSE OF RESEARCH: RESEARCH QUESTIONS, OBJECTIVES AND HYPOTHESES

It is important for the researcher to specify the purpose of research i.e., why this research is being carried out. Often, this step involves research questions, objectives, and hypotheses. Research questions are prepared or written once the statement of the problem is finalized. Generally, the research questions of a research study are the foundation for its objectives. Objectives of the research study are prepared or specified after formulating research questions. Objectives

are framed based on research questions. Based on the objectives and reviewed literature, from where recent, latest, and significant findings related to the problem emerge, a hypothesis is framed which also serves as a guide during the research process. Let's discuss the formulation of research questions, objectives, and hypotheses in detail.

10.6.1 Research Questions and Objectives

A research study aims to find answers through research questions. The research question is a specific question or an inquiry that a researcher or an investigator intends to conduct. The purpose of the statement of research is narrowed in the form of a research questions.

Generally, question statements are interrogative statements that narrow the purpose of statements to specific questions that the researcher seeks to answer in the study. In both types of research, quantitative and qualitative, question statements are framed. The research questions differ greatly and there is no one specific or correct way to write or state them.

Research objectives state or reflect the expectations and accomplishments of a research process. A researcher explores its research questions through research objectives. There cannot be any research without research questions. Research questions require answers, explanations, or address them through research objectives. Objectives of research summarize what is to be achieved. Objectives should specify what you want to do in your study, where and for what purpose. The formulation of objectives will help you to:

- Focus the study,
- Avoid the collection of data that are not necessary for understanding and solving the problem identified, and
- Organize the study in clearly defined parts or phases.

While formulating objectives for the study the following points are kept in mind:

- Cover the different aspects of the problem and its contributing factors in a coherent way and logical sequence;
- Specify exactly what you are going to do, where and for what purpose;
- Use action verbs that are specific enough to be evaluated, for example, to determine, to compare, to verify, to calculate, to describe, etc.
- Avoid the use of vague non-action verbs such as to appreciate, to understand or to study, etc.

In the context of the selected research problem, that has been stated earlier the research questions would be like that:

- (i) How do computer-assisted instructions improve academic achievement for secondary school students?
- (ii) How do computer-assisted instruction support secondary school students in retaining the concepts in science?

Just look at the word HOW in each of the questions. See, the first word of these research questions is "how" means the investigator is supposed

to explore the mechanism through which the computer-assisted instruction helps the secondary school students in learning and retention of concepts in science. If the word of research questions is “do” then research questions are read as – ‘do computer-assisted instructions improve academic achievement for secondary school students? Under such circumstances, the research questions will be answered by respondents either as “yes” or “no”, that is it does not require a probe into the mechanism through which it works. Similarly, starting the research questions with the words “what” etc. does not motivate the researchers to investigate. As such questions are not research questions but mere questions that are to be answered in examination mode but research questions need to be explored, probed, and investigated.

After framing these research questions, the researcher/investigator develops research objectives. For the above research questions research objectives would be :

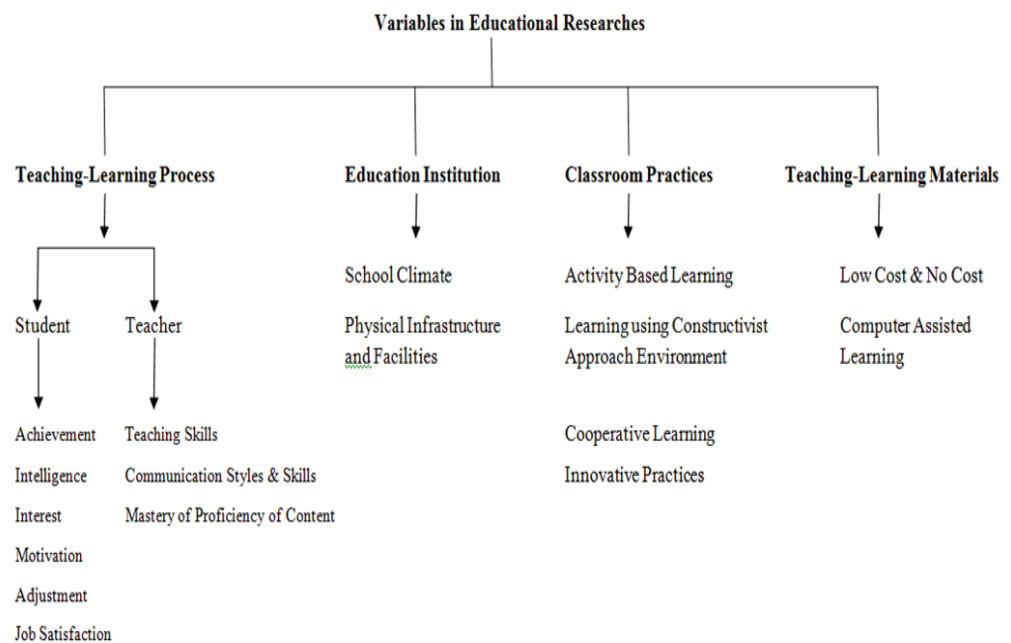
1. To prepare a Computer Assisted Instruction (CAI) Programme on the selected syllabus of Science for secondary students;
2. To analyse the effectiveness of Computer Assisted Instructions (CAI) and lecture method on the academic achievement of secondary students in science.

It must be noted here that none of the research questions reflects the mention of the lecture method, as research questions, being general, do not mention any kind of comparison of computer-assisted instructions with any teaching methods. Research objectives, being specific, clearly mention the comparison between computer-assisted instruction with some particular teaching method that is lecture method in this study.

After developing research objectives, you as an investigator need to formulate research hypotheses. To discuss hypotheses first we have to understand the variables in research.

Research Variable

A researcher explores a phenomenon with the help of variables. A variable is an attribute or character/feature that reflects or expresses some concept or construct. Variable changes or varies from time to time, person-to-person and situation-to-situation. Or we may say that a variable refers to a characteristic, any feature or quality that increases/ decreases over some time or takes on different values in different contexts and situations. For example, height is one example of a variable that varies within an individual from time to time and between individuals at the same time. A child’s height from birth to 5 years shows the changes i.e. birth to one year age, one to two years, and similarly 4 to 5 years of age. Another height of all students of 6 years studying in class one shows variations in their heights. A variable does not show change by itself. It is always associated with events or objects in an educational setting. In educational research, a variable stands for a characteristic or property of persons involved in the teaching-learning process, educational institutions, classroom practices, teaching-learning material, and so on which are presented in the following figure.



Generally, variables can be categorized into two types:

- **Independent Variable:** Independent variable is the condition that is to be manipulated by the researcher to know its effect ..
- **Dependent Variable:** Dependent variable is the condition on which the effect of manipulation of the independent variable is seen. Or we can say that it is the condition or characteristic that changes according to the changes introduced to the independent variable.

The given example of experimental research in which the investigator attempts to explore the effect of one variable (independent variable) on another variable (dependent variable). Here the independent variable is the computer-assisted instruction or lecture method and the dependent variables are the academic achievement.

10.6.2 Hypotheses

A hypothesis is a testable, clear, and predictive statement about the possible outcomes of a research problem. The hypothesis is an evidence-based assumption about a phenomenon. It is a declarative statement about the relationship between two and more variables. Hypothesis in a general sense means an intelligent guess. For example, on a cloudy day, in the monsoon season, while going out of home it is advised to take an umbrella. As it has been observed that in monsoon season, on a cloudy day there may be rainfall, so as a measure of safety one should have an umbrella with him/her while leaving home. So, as an intelligent guess, it may be hypothesized that there are better or more chances that clouds in the monsoon usually may bring rain.

A hypothesis has the following characteristics:

- simple, precise, and clear to read

- state the relationship between the cause and the effect
- be logically consistent and free from ambiguity
- be testable.

The resemblance between the two phenomena or observations may be the source of the hypothesis. The specific sources of hypothesis are general culture, from scientific laws or theories, personal experiences, and analogies.

A hypothesis can be stated in several forms. They are:

Directional Hypothesis: The hypotheses which stipulate the direction of the expected differences or relationships are termed directional hypotheses. For example, “There is a positive relationship between the yoga practices and retention of learning” is directional.

In other words, we can also say that the directional hypothesis shows the relationship between the independent variable (cause) and dependent variable (effect) as well as the direction of that relationship between them. For example, there is a positive relationship between a balanced diet and the Intelligence Quotient (IQ) level of students. It means that students eating a balanced diet for two years may have higher IQ levels than the students not having a balanced diet. Here, a balanced diet is an independent variable and IQ levels are the dependent variable. The direction of the effect of a balanced diet on IQ levels is evident that the students having a balanced diet have higher IQ levels than the students with no balanced diet.

Non-directional Hypothesis: Similarly non-directional hypothesis is a statement that shows a relationship between variables but it does not predict the direction of the relationship between them. A research hypothesis, which does not specify the direction of expected differences or relationships, is known as a non-directional research hypothesis. For example, the hypothesis: “There is a difference in the creativity of science group and arts group students”.

Null Hypothesis: It states that there is no significant difference between the variables concerned. For example, there is no significant difference between teaching aptitude of two-year and four-year B.Ed. students.

For the selected research problem (discussed above) , the investigator should formulate a null hypothesis (H_0). Hypotheses can be formulated like:

- √ There is no significant difference in the academic achievement of students in science taught through computer-assisted instructions and lecture methods.

The null form is preferred by most of the experienced research personnel. This form of hypothesis is mostly utilized in statistically testing the significance. The no difference statement assumes or indicates that the two groups will be tested and found to be equal.

Check Your Progress 3

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

5. Which points need to be kept in mind while formulating objectives for the study?

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6. What do you understand by hypothesis?

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7. Differentiate between dependent and independent variables.

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8. Identify dependent and independent variables out of the following problems:

- a) Effect of environmental awareness on the pro-environmental behaviour of secondary school students.
- b) A study on creativity about cognitive ability and achievement of senior secondary science students.

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10.7 RESEARCH DESIGN

Once the problem is identified and research questions, objectives, and hypotheses are formulated, a research design is selected to find or solve this problem and to test the hypotheses. When selecting a research design, it is important to ensure that it is appropriate, feasible, valid, workable, and manageable. We must have valid and strong reasons for selecting a particular design.

The research design is a skeleton that gives shape to the research work. **It is the plan, structure, and strategy** of investigation conceived, to obtain an answer to a research question. The **plan** is an overall scheme that includes - what the researcher will do from writing or framing hypotheses and their operational implications about the analysis of data. The **structure** is the outline of a scheme

for doing research. **Strategy** means which method to be used for sample selection from the population. It also includes a method(s) of data collection, tool(s) to be used for data collection, and statistical techniques to be used for the analysis of data.

So a research design consists of a method of research, methodology planned for the research, i.e. sampling procedure, selection of tools for data collection, identification of statistical techniques, etc. Let us discuss all the components of research design one by one in the following sub-sections.

10.7.1 Research Methods

Research studies have been conducted by using different research methods. There are various types of research studies like - descriptive, survey, historical, ethnography, case study, experimental, quasi-experimental, etc. For any type of research study, the rationale behind the selection of the research method, is an important consideration.

Let us recall the research topic mentioned earlier in the unit and think appropriate or suitable research design. The most appropriate and adapted research design for this case will be a pre-test and post-test quasi-experimental research design or method in which the researcher or investigator conducts the research study in a school setting, takes the entire class students as such and does not disturb the school or classroom setup.

For a detailed description of types of research studies, you may refer to 'Unit -9 Introduction of Educational Research' of this block.

10.7.2 Techniques of Sampling

Sampling is the part of statistical practice concerned with the selection of individual observations intended to yield some knowledge about the concerned population. A population can be defined as all people or items or the characteristics one wishes to study and understand. Because there is very rarely enough time or money to gather information from everyone or everything from a population, the goal becomes imperative or mandatory for finding a representative sample of the population. The sample is the segment or part of the population selected for the research. This sample selection by the researcher or an investigator refers to 'sampling'. Generally, sampling is of two types: probability and non-probability sampling.

Probability Sampling: Probability is nothing but the number of chances one particular student gets in a class in the selection for a particular activity. For example, in a class of 40 students what are the chances of getting two students for an activity. The chances are equal for all students. Thus the chances would be 5% for two students each. Similarly, in probability sampling, every member of the population has an equal chance of being selected in the sample for the study as it is done through the process of randomization. When every element or person of the population has the same or equal probability of selection, this is known as an equal probability or chance of selection. It includes some sub-categories like - Simple Random Sampling, Systematic Sampling, Stratified Sampling, and Cluster sampling. These are various ways of probability sampling and each one of them has two things in common. They are:

- Every element in the selected population is known to have non zero probability of being sampled and
- Involves or follows random selection at some point in sampling.

Non-Probability Sampling: Non-probability sampling is another type. In this type of sampling, some elements of the population have no chance of selection or where the probability of selection can't be accurately determined. Non-probability sampling does not involve a random process of sample selection and is based on convenience or some other criteria developed by the investigator for sample selection. A non-probability sampling includes Accidental Sampling, Quota Sampling, Purposive Sampling, etc.

For better understanding about the concept of population and sample let's take same the research problem, that has been stated earlier. Here population refers to all the secondary school students enrolled in a district, state, or country. The investigator randomly selects a senior secondary school from a list of the total number of schools. The chosen school is the sample. In that school, he/she delimits his/her research work to class IX only because the school principal does not allow any outside activity for class X as it is a class that has to appear for its first public examination through CBSE or state board. Now, at class IX the investigator finds that there are three sections namely IX-A, IX-B, and IX-C. The investigator again randomly (by lottery method) selects any two sections as there would be two groups- one experimental and one control group. He/she finds that IX-A and IX-C are randomly selected. The investigator again randomly assigns these sections as experimental and control groups as IX-A (experimental group) and IX-C (control group).

The investigator gives the treatment to class IX-A by teaching science through computer-assisted instructions for eight weeks. At the same time, the investigator teaches science to class IX-C by lecture method for eight weeks. The point to be noted here is that both the groups should be taught the same content for the same time duration by the same teacher (that is the investigator him/herself).

10.7.3 Tools for Data Collection

The collection of data is an important step in providing the information needed to answer the research questions. Data can be collected through various research tools. Research tools are data-collecting instruments. Interview schedule, questionnaire, observation schedule, inventory, checklist, rating scale, etc. are some common research tools used by the researchers across disciplines and themes. Let us discuss them:

Interview schedule: It is a research technique in which the investigator/researcher/interviewer asks open-ended questions to converse with the interviewee or the respondent. Through the interview, the interviewer intends to elicit information about the subject under investigation and notes/records it as data. One of the basic considerations is that the interviewer must have a sound knowledge base about the subject being explored so that he/she can appropriately understand the interviewees' responses.

Questionnaire: It is a research tool that offers a series of questions to the respondents and aims at collecting information from them about the phenomenon under investigation. A questionnaire may be open-ended or closed-ended. An

open-ended questionnaire allows respondents to assert themselves in some depth or detail and thus researcher gets qualitative data. The closed-ended questionnaire requires the respondents to choose their response from a given set of predefined responses like multiple choice questions or yes/no type items. A closed-ended questionnaire is used to collect quantitative data from the respondents.

Observation: It means carefully seeing. Observation may be used by the researcher to collect and record the information. Observation may be participatory or non-participatory. In the former, the observer deeply gets involved with the phenomenon or subjects being observed but, in the latter, it is not so as the observer studies or observes the subjects at some distance without getting involved with the setting of the group. Hence, participatory observation gives deep information to the observer but non-participatory observation leads to a shallow level of information to the observer.

Inventory: Inventory provides the researchers' information about the preferences/likes and/or dislikes/aversions of respondents and thus helps in acquiring a better understanding of the respondents and their problem(s).

Checklist: A checklist is a form that is used to collect data and hence it becomes easy to extract the information. A checklist is collected information about some institute, event, or problem. It supports pattern detection in the data collected.

Rating Scale: It is a sequence of statements that indicate the degree/frequency of the skills, responses, or behaviour of the respondents. The scale maybe 3, 5, 7, 9, or 11 point scale.

For more details about types of research tools, you may refer to 'Unit -13 Tools and Techniques for Data Collection'.

Since every research has different purposes and is conducted in different ways hence the investigator employs appropriate research tools for data collection.

Let's continue with the same study referred to earlier, to discuss research tools for data collection are concerned. In this case, the investigator uses the Standardized Intelligence test to test or measure the intelligence level of the sample students and to assess academic achievement subject related level he/she uses self-made academic achievement test.

The investigator may use an intelligence test (standardized test) to ensure that the experimental group (IX-A) and control group (IX-C) are comparable or similar and do not significantly differ from each other concerning the variable intelligence. Because, if there is a difference between the two groups concerning intelligence then the results in favour of either of the group might be attributed to the intelligence difference between them. In both the groups, the investigator also administers a pre-test (researcher-developed test) that is based on concepts, sub-concepts in the selected units of the science subject. This is done to ensure that these two groups do not differ significantly or drastically from each other on previous knowledge in science subjects.

Now, the investigator imparts treatment for eight weeks by teaching science to the experimental group (class IX-A) through computer-assisted instructions and teaching science to the control group (class IX-C) by lecture method. After

eight weeks of the treatment, the investigator administered tests self-made test to assess the 'academic achievement'.

10.7.4 Statistical Techniques for Data Analysis

Now you are aware of the selection of tools and techniques used to collect data in various contexts. Data collected from various sources has no meaning unless categorized or clarified into meaningful points under study. So, statistical procedures are used to make data meaningful. In the context of research, statistical procedure refers to a method of representing and analyzing the data collected. For example in the newspapers you might have come across news regarding the comparison of the performance of girl students vis-a-vis boy students at public examinations, this finding is possible only after analysis of the data. You may find other examples too in our day-to-day news or other sources.

Generally, analysis of data is done by using descriptive statistics and inferential statistics. Descriptive statistics is concerned with the basic features of the data and it summarizes the data. In research, mean, mode, and median are commonly used descriptive statistics. Inferential statistics are used to infer generalizations about the population. Hypothesis testing, regression analysis, etc. are some common inferential statistics applied in research.

Let us continue with the same example, as mentioned above, to see the effect of computer-assisted instruction on academic achievement, a null hypothesis is formed. To test the null hypothesis t-test may be used.

Check Your Progress 4

- Note: a) Write your answers in the space given below.
b) Compare your answers with those given at the end of the Unit.

9. What do you understand by population?

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10. Differentiate between probability and non-probability sampling.

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11. What do you understand by descriptive statistics and inferential statistics?

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10.8 COLLECTION AND INTERPRETATION OF DATA AND FINDINGS

The next step of research is to collect information from respondents (sample) of the study. The individuals are selected either through probability or non-probability sampling methods based on the nature of the study. It is very important that while collecting information from the respondents, the researcher must abide by the protocol of ethics of research i.e. prior permission from respondents, anonymity, and confidentiality of their information along with using the data solely for the stated research purpose.

After the collection of data/information, we have to interpret data/information to draw certain conclusions or inferences. Data interpretation is the process of making sense of numerical data that has been collected, analyzed and presented. A common method of assessing numerical data is known as statistical analysis. Interpretation of findings is done in terms of the existing knowledge in the light of the hypothesis.

For more details about Data Analysis, you may refer to Units 15 - 'Nature of Data and its Analysis and Interpretation' and Unit 16 and 17 'Analysis of Quantitative Data I & II'.

10.9 REPORT WRITING

The most important part of the research process is the preparation and presentation of the research report. The researcher is obligated to give a detailed account of all his/her experiences and thinking involved in the process of research, from identifying the problem to concluding. Presentation of the detailed account of research experience is called research report. The research report must reflect what was actually carried out and how it was initially planned.

Generally, report writing is the concluding task of the research endeavor. In this stage actually, the researcher produces the entire process in written form. Report writing is not merely an instrumental activity, but an opportunity to express understanding about the outcomes of educational endeavours. If you can concentrate on this creative dimension of report writing then you will probably enjoy the process much more. The research report whether it be a thesis or dissertation or research paper or report usually follows a common pattern. A research report generally consists of four to six chapters/sections. The content of a research report generally has the following format:

Format of Research Report

Chapter -1 Introduction

- Rationale of the study
- Statement of the problem
- Research question(s)
- Objectives of the study
- Hypothesis
- Definition of the operational terms
- Delimitation

Chapter -II Review of Related Literature

Chapter-III Design of the Study

- Plan and procedure
- Research Methodology
- Population and Sample
- Sampling technique used in sample selection
- Description of Tools and Techniques
- Collection of Data
- Techniques Used to Analyse Data (Statistical or content analysis)

Chapter -IV Analysis of Data and Interpretation of results

Chapter -V Conclusion and Implications

- Implications of Main Findings
- Suggestions for Further Researches
- Summary

The researcher must be sensitive enough about what should be written in the report and how it should be written. A good research report has some characteristics. Following are the characteristics of a good research report:

Communication: The main purpose of reporting is to communicate your research work to a larger group of academics. Remember that your report would be of great utility to many other academicians and researchers.

Intellectual Coherence: Before starting to write your report, be sure about the aims of your academic activity. These aims are the foundation for your theoretical perspective and methodology. The overall research design should be appropriate to the aims.

Judicious linkages to Literature: Within the report, there should be an adequate review of the relevant literature. There are numerous extracts from different studies and articles. You should be judicious in selecting such literature and studies that are quite pertinent to your work.

Structure: The quality of the report depends on the way it is structured. You should structure the report that suits the nature of your research work. Depending on the nature of your work, decide the number of chapters and sections.

Clarity and Precision: Further, the report should be clear and precise. Remember that you are writing about fairly complex ideas and these have to be expressed with great precision. In a good report, one idea follows from another, particularly in presenting a conceptual framework. Report writing tends to proceed very logically and systematically, describing the first process, then explaining how this relates to the next issue.

One should avoid the use of long sentences and compound sentences as far as

possible because they hinder comprehension. Instead, use simple sentences and avoid the use of passive voice as far as possible.

Objectivity: As a very general rule, the report tends to avoid mentioning your personal feelings or attitudes. The emphasis is normally upon considering the research process in a fairly objective manner. The research report should be objective in terms of its focus on the research study. It should be free from digressions and it should not include anything that is not relevant to the research study.

Apart from the above-mentioned features of a good research report adding or include references is also one of the main aspects to make a research report authentic.

10.9.1 References

References mention to the sources that have been included or mentioned or cited by the researcher in the study. Every source cited in the research report must be included in the references and every entry mentioned in the references must appear in the standard format or style in the report. There are different styles to writing references for research reports, viz. Modern Language Association (MLA) format, the Chicago Style, and American Psychological Association (APA) format. Generally, in educational research, referencing is done by APA (American Psychological Association) format. The 7th edition is the latest format of APA style of referencing. Some tips for referencing are:

- A book or journal name is always in italics.
- If a citation is more than one line long, indent the second line five to seven spaces.
- Put the references alphabetical order by the author's surname/last name
- Where there are more than two authors, list the authors in the order they are listed on the title page of the book or the document or the research paper.
- If you use information from an article in a book/ journal, the article name is listed before the name of the book/journal.

Some examples to write references in APA format are given hereunder:

Journal Article Citation

Singh, M. (2014). Usage of E-Learning Tools in India. *Journal of Educational Technology*, 11(1), 30-40.

In the above citation, you can see the surname of the author is followed by first initials then the Year of publication of the article in (round brackets), the Article title is followed by Journal title (in italics), Volume of the journal (in italics), Issue of the journal (no italics), Page range of the article.

Book Citation

Sharma, G. (2017). *Research Methodology* (3rd ed.). Vinod Publisher, New Delhi

In the above citation, you can see that referencing for a book in APA style must include: Author or authors. The surname is followed by first initials, Year of publication of the book (in round brackets), Book title (in italics), Edition

Check Your Progress 5

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

12. Write any three features of a good research report.

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13. What are the different styles of writing references for research reports?

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10.10 LET US SUM UP

In this unit you studied the significance of research questions, formulation of research objectives, framing of research hypotheses, selecting a research design, methods to be employed for sample selection, techniques for data analysis, reporting the findings, and generalizing the discussion.

It was explained to you that Research as a process is a systematic activity that explores the phenomena around us. The research follows a scientific and systematic process that includes methodology and research design. Research tools collect data for the study. A research study has research questions, objectives, and hypotheses. Through the sampling process, a sample is selected from a population. The data collected is subjected to treatment for data analysis. Depending on the nature of data collected, and findings are derived and after which findings are interpreted in response to the findings reported in the reviewed searches in the study. The report is concluded with a summary of the detailed report.

10.11 REFERENCES AND SUGGESTED READINGS

- Best, J. W.; & Kahn, J.V. (2016). Education research (10th ed.). New Delhi: PHI.
- Bogdan, R. C.; & Biklen, S.K. (2007). Qualitative research for education (5th ed.). New Delhi: PHI.
- Cohen, L.; Manion, L.; & Morrisison, K. (2007). Research methods in education (6th ed.). London: Routledge.
- Kaul, L. (2020). Methodology of educational research (5th ed.). New Delhi: Vikas Publishing House.

10.12 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

1. Steps for the research process
 - Identification of a Research Problem
 - Review of the Related Literature
 - Purpose of Research: Stating or writing Research Questions, Objectives and Hypotheses
 - Design of the Study
 - Collection, Analyze, and Interpretation of the data
 - Research report writing
 - References and Appendices
2. Self-exercise
3. Sources for reviewing the related literature
 - Internet: on-line systems
 - Scholarly journals
 - Books
 - Theses / Dissertations / Project Reports
 - Dissertation Abstract International
 - Government documents
 - Policy reports and presented papers
 - Bibliographic indexes.
4. Bring clarity and focus to the research problem; helps to establish the links between what is proposed or intending to examine and what has already been studied. improve or relook at research methodology; and contextualize findings.
5. Refer to 10.6.1
6. A hypothesis is a testable, clear, and predictive statement about the possible outcomes of a research problem. The hypothesis is an evidence-based assumption about a phenomenon.
7. Independent variable is the condition that is to be manipulated by the researcher to know its effect that is measured through its absence. The dependent variable is the condition on which the effect of manipulation of the independent variable is seen.
8. a) Independent variable: Environmental Awareness and Dependent variable: Environmental Behaviour
 b) Independence variable: Cognitive Ability and Achievement and Dependent variable: Creativity
9. A population can be defined as all people or items or the characteristics one wishes to study and understand.

10. In probability sampling, every member of the population has an equal chance of being selected in the sample for the study as it is done through the process of randomization. In non-probability sampling, some elements of the population have no chance of selection or where the probability of selection can't be accurately determined.
11. Descriptive statistics is concerned with the basic features of the data and it summarizes the data. In research, mean, mode, and median are commonly used descriptive statistics. Inferential statistics are used to infer generalizations about the population. Hypothesis testing, regression analysis, etc. are some common inferential statistics applied in research.
12. Clarity and precision, intellectual coherence and objectivity.
13. There are different styles to writing references for research reports, viz. Modern Language Association (MLA) format, the Chicago Style, and American Psychological Association (APA) format.



UNIT 11 UNDERSTANDING ACTION RESEARCH

Structure

- 11.1 Introduction
- 11.2 Objectives
- 11.3 Research Evidence to Action Research
- 11.4 What is Action Research?
- 11.5 Characteristics of Action Research
- 11.6 Comparison between Conventional Research and Action Research
- 11.7 Approaches to Action Research
- 11.8 Steps Involved in Conducting Action Research
 - 11.8.1 Recording Evidence in Action research
- 11.9 Let Us Sum Up
- 11.10 Unit End Exercises
- 11.11 References and Web Resources
- 11.12 Check Your Progress: Possible Answers

11.1 INTRODUCTION

My friend Ms. Jenny is a teacher in a reputed school in the city. She was very good at her subject and popular amongst her students. She wanted to elicit the best from her students and left no stone unturned to deliver her best. Almost all the students did well in her subject even the ones with not so good previous record improved their performances.

She strived hard to bring all her students to a basic standard and succeeded also to some extent. But there was a student named Josh who showed no improvement at all. She tried a lot, explored many ways to improve his performance but nothing worked. That was the incident that made her think? What to do? How to improve Josh's performance? Why is he unable to match the bar set by her? Why is he not showing any improvement?

Now, I am pretty sure that maximum school teachers might have come across similar kinds of problems in their life and every student must have got a glimpse of it during their school days. ***What do you do to meet such problems? What is the solution to such classroom problems? So, let's try to find out the answer how to explore the possible solutions to such teaching-learning problems.***

It is a well-known fact that learning should cater to the needs of the learners. It gives learners, ample scope to explore and attain knowledge based on their previous experiences. But often we hear, and research also has proved that despite many initiatives undertaken by the government we the teachers have to struggle to achieve good learning outputs. Reasons are many due to lack of infrastructural amenities, of lack of skilled human-power, at times we hear teachers complaining that learners are not interested or are not ready to learn or they don't understand the learning points or concepts, or they don't reflect, etc. So, the question arises, in what ways the teaching-learning situation can be improved? What are the ways to tackle classroom/immediate teaching-learning problems? How a teacher can handle the vivid problems she faces in a classroom? How she can improve the teaching-learning process and so on. Let's try to find out a solution to such issues by adopting a research method. A research method that is specific to a problem and is meant to handle a specific classroom situation, a method demands *immediate action* on the part of the teacher, it is popularly known as **action research**. The place of action research has been recognized very well in teacher education programs. So, it is expected that every learner who opts for education as a subject for graduation must be acquainted with the fundamentals of action research. So, this unit focuses on the concept, characteristics, and importance of action research. This unit also incorporates methodological details of action research.

11.2 OBJECTIVES

After completion of the unit, you will be able to

- explain the concept of action research;
- discuss the significance of action research in teacher education programs;
- identify characteristics of action research;
- differentiate basic features of action research from other kinds of researches;
- describe steps to formulate an action research plan; and
- develop a proposal of action research.

11.3 RESEARCH EVIDENCE TO ACTION RESEARCH

Though the number of studies discussed underneath is less, still it gives a broad idea to understand what kind of studies have been done in the area of classroom research:

Varsat (2015) performed a study on preservice English teachers' reflectivity through a series of action research and found that their classroom performance was enhanced. The study proves that action research can be used as a tool to enhance classroom performances. (Milford, Hellaby & Strang 2013) through their data collection and analysis, identified students' common concerns and apprehensions and utilized them as a basis for efforts to enact change for the betterment of the students involved in the class. Saxena (2017) in his study on disruptive behavior of students found that teachers identified children showing disruptive behaviour by direct observation, checking the status of

assignments, academic performance, and feedback from peers. And adopted an educative programme which was effective in bringing changes into the practices adopted by teachers for dealing with the disruptive behaviour of the children. So, this study supports reflection which is again an area of action research. Kannan (2014) performed a study to know how to improve students' ability to solve numerical problem questions, he conducted three levels of action interventions, and the results revealed marked improvements in the performance of the students. Thereby, supporting the active intervention by the teacher.

Going through the above research it may be concluded that good teaching can be done through experiences in the classroom and through good research in which one will inquire into self-identified teaching-learning problems to understand the complex dynamics working in the classroom setup and to develop strategies for improvement and find solutions to the problems. To perform these roles successfully, **action research and reflections** are essential. It is, therefore, logical and reasonable to use this approach for creating better teaching and learning situations.

The above research evidence proves that there might be different types of strategies of teaching in the classroom, but **action research** is one strategy that works well as it offers an opportunity for continued reflection to improve and adapt.

So, from the above researches let's try to explore the concept of action research.

11.4 WHAT IS ACTION RESEARCH?

Now, let's recall what the teachers in the above research did? *Yes, they usually go for a solution-oriented investigation that was done either in a group or individually.*

So, we can say, that action research is a process especially adopted for improving the teaching-learning situation. It is a deliberate, solution-oriented investigation that is done in a group or personally. The terms '**action**' and '**research**' highlight the essential features of this method; where **action** means trying out new ideas in practice for improving the curriculum, teaching, and learning process and the word **research** means finding a solution to a problem systematically. It can be said that action research, approaches education as a unified exercise. It recognizes the teacher in class, as the best judge of her/his total educational experience. It is a powerful method of bridging the gap between theory and practice. The prevailing focus of classroom research is to expand the teacher's role as an investigator. This approach is naturalistic, collaborative and uses participant-observation techniques (Belanger,1992). Action research is participant-driven, collaborative, and reflective.

The very basis of action research is **involvement**, and the educational basis of action research is **an improvement**. The operation of an action research demand changes. Truly speaking action research means **ACTION** both, in the system under consideration, and of the people involved in that system.

The problems in action research primarily relate to time, situation, place, method of teaching, etc. The solution of which is to be found out through,

thorough investigation. Problems related to classroom discipline, language pronunciation, problems related to different topics, difficulty in understanding concepts in different school subjects, etc. all fall under the scope of action research.

In addition to this, we should also know that the credit of introducing the term action research goes to Kurt Lewin who coined the term while working at the University of Iowa, (Carr&Kemmis, 1989).

What is not Action Research?

In most cases when we hear the word **research**, we think of library projects. Though it does not involve a problem-solving approach to resolve an issue directly, but rather a systematic approach to wising up about a specific dilemma that needs attention. As we said, action research is not a library project where we learn more about a topic that interests us. It is also not research where we attempt to uncover what is wrong, but rather, it is a search for solutions that are authentic and useful to the users. In a nutshell, it is a process of finding solutions to problems that arise in the field. So, action research is not about learning why we do certain things, but rather how we can do things better. It is all about changing our teaching techniques to impact students' behavior/problems. Action research helps in improving classroom practices.

Check Your Progress 1

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

1. What do you understand about action research?

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2. Fill in the correct word.

- a. The credit of introducing the term action research goes to
- b. is a process of finding solutions to problems that arise in the field
- c. Action research is participant-driven, collaborative and.....
- d. is research based on people's real-world experiences.
- e. Action research aids in improving.....

11.5 CHARACTERISTICS OF ACTION RESEARCH

Borgia and Schuler (1996) have emphasized the role of 'Five Cs' viz., **commitment, collaboration, concern, consideration, and change** in action research. These five Cs are diagrammatically represented in figure 11.1:

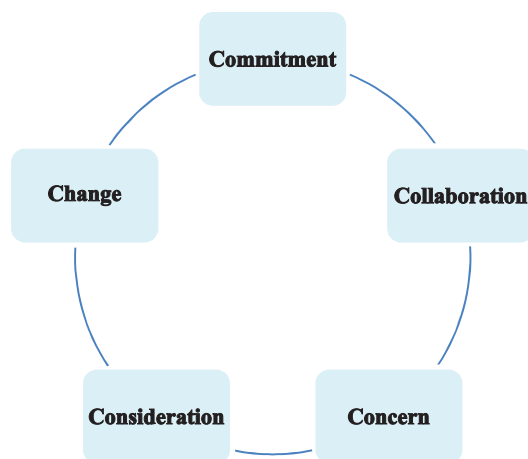


Figure 11.1: Role of five C's in Action Research

- **Commitment:** Commitment is the first characteristic of action research and it focuses on time. The participants need time to get to know and trust each other and to observe practice, try new approaches, and document, reflect and interpret the results. So, unless one is committed s/he cannot conduct good research.
- **Collaboration:** In action research, each person contributes, and each person has a stake, meaning thereby, that the power relations among participants are equal. It involves a cyclic process of sharing, giving, and taking.
- **Concern:** *In action* research trust in each other and the value of study/task is important. Here, the participants should develop the support of critical stakeholders.
- **Consideration:** Consideration is a challenging assessment of one's behavior. It requires concentration and care as one seeks patterns and relationship that generates meaning with the investigation.
- **Change:** Change is ongoing and at times difficult, but it is an important element to remain as an effective teacher.

Apart from the above-mentioned features let's try to work out some more characteristics based on the above cited research studies.

- The first thing is that all teachers as researchers possessed **a clear vision** of the situation to plan activities for the problematic situation, hence, we can say that- **Action research enables the teachers to have a clear vision** of the problematic situation, **which in turn helps identify ways and means to handle the problem.** Remember in all the researches cited above in section 11.3 one thing was common. What was it? That they particularly dealt with the complex social situations of a classroom or a school. Hence, it can be said that action research tries to find solutions to complex social situations existing in a classroom or a school.
- In the above research studies, there is **an evidence of support** being sought from different stakeholders because in action research collaboration from different stakeholders is required. Stakeholders help in understanding the situation and working as a team when the need arises.
- In action research one needs to ponder on the issue from different angles. This means it requires **reflection** as an essential feature.

Educational Research as a Practice

- A thing that is very obvious from the above studies is that the process of action research focuses on **improving the teaching-learning situation**.
- This kind of research follows the basic step of any research, i.e. it is also systematic. But unlike many types of research, it is very specific, i.e. specific to a particular class, school or situation, so **findings of action research are not generalized**.
- It helps a teacher to **engage in intellectual pursuits and thus becomes a continuous learner**. Therefore proves to be beneficial in one's professional development.
- Did you notice one common thing in all the above-cited research studies? They all in a way helped planning and **restructuring the existing education** system. So, this is another important characteristic of any action research.
- It is **narrowly focused research** mostly undertaken by teachers and practitioners in a given specific situation.
- Action research is **contextual**; this is an important characteristic of action research, i.e., every research is performed for a certain specific context.

Let's enumerate the benefits a teacher gets through action research:

- Action research enables the teacher to reflect and react as per the need.
- It helps in creating a conducive environment for teaching and learning.
- It enables teachers to study and analyze the problem.
- It helps in the professional development of the teachers as the teachers come to know how to handle the problems more systematically.
- It helps in finding solutions to the problems most suited to the situation.
- It helps in developing better communication between the teacher and the taught.

Check Your Progress 2

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

3. Explain the meaning of the five C's in action research?

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4. List out any three characteristics of action research.

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5. In what ways does action research helps a teacher?

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11.6 COMPARISON BETWEEN CONVENTIONAL RESEARCH AND ACTION RESEARCH

What is not action research? If you recall, it gives us a certain idea about not getting confused with other types of research. The underneath tables present clarity on knowledge and understanding about action research.

Table 11.1 Comparison Between Conventional Research and Action Research about ‘Wh’ Questions

<i>Comparison</i>	<i>Who?</i>	<i>Where?</i>	<i>Why?</i>
Conventional Research	Anybody who is interested in doing a research can do it.	Can be done in any researchable environment.	To report and publish conclusions that can be generalized to larger populations.
Action Research	Mostly done by the teachers, practitioner administrators of the schools.	Preferably done in schools and classrooms.	To take <i>immediate actions</i> and to bring positive educational changes in the immediate setting in which it was conducted

Apart from the three important ‘*Wh*’ questions about action research, it is important to discuss a few more parameters on which action research differs from other educational research.

Following are the dimensions on which action research shows a marked difference from other researches performed in the field of education.

Table 11.2 Comparison between Conventional Research and Other Educational Research

S I . No	Points of Comparison	Action Research	Other Educational Research
1	Purpose	To bring improvement in functioning of school system at institutional level.	To understand and explain the nature of educational phenomena.

		To solve problems faced by practising teachers/managers in day-to-day situations by systematic interventions at classroom/ institution levels.	To generate knowledge by means of creation/ refinement of theories concerning education.
2	<i>Nature of problems</i>	Action research is solely concerned with the problems faced at grass root level (i.e., teaching learning process at classroom level/ school level).	The research problems are concerned with education system in the context of internal and external forces interacting with it and having large scope for generalization.
3	<i>Reasons for Research</i>	Bringing improvement of teaching learning practices in the context of one's own school/ classroom setting.	Original contribution of the researcher to the field of knowledge or validating the existing theories concerning to education.
4	<i>Population/ Sample of the study</i>	The study is conducted on the particular section, class or some aspects of school. Mostly population and sample remain same.	Population is well defined. Sample size is quite large. Appropriate methodology is adopted in sample selection. The nature and size of sample indicates the generalizability of the study to its population, hence, representativeness of sample is to be ensured by the researcher.
5	<i>Generalization</i>	Generalization of the findings of the study is not the focus. Is only concerned with one's own school setting having its scope for improvement in practices at class room level or school level only.	Generalization is an essential feature of conventional research. General research aims at exploring the nature of reality with universal character applicability.

6	<i>Design of the study</i>	Flexible design is adopted. Study is conducted in natural setting. Researcher intervention in solving the problems is basic feature of action research design. Tools and techniques like observation, interview, teacher made tests are used for data collection.	Systematic exercises are done to arrive at appropriate research design. General research follows rigid designs. Manipulation of independent variables is done through appropriate designs. Methodological rigour is essential for analysis of quantitative as well as qualitative data.
7	<i>Researcher</i>	Generally teachers, head masters/ Principals, Managers/ Supervisors plan and conduct action research studies. The researchers are <i>directly</i> concerned with the school system. The researcher is concerned with the problems faced by themselves in day-to-day practices of school system and bringing improvements in one's own work style and school practices.	The researcher need not be a part and parcel of the problems under study. Usually, the students at Doctoral/Master's degree level and the specialists in the Universities/Colleges/ research institutions conduct researches. The researchers are <i>indirectly</i> concerned with the education system. Rigorousness of study on research methodology is needed for conducting education and research.

Source: 11.6 adopted from Unit 5- 'Action Research, MES-054 'Methodology of Educational Research', 2006, IGNOU.

Check Your Progress 3

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

6. Differentiate action research from other researches concerning 'population and size of the sample.'

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7. How action research is different from other researches concerning generalization?

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11.7 APPROACHES TO ACTION RESEARCH

After getting an insight into different dimensions on which action research differs from conventional researches, it becomes imperative to know what are the different approaches followed in action research. Calhoun (2002) has done a lot of work in the field of action research. And he suggested three popular types of approaches that one can follow while conducting action research. These approaches are depicted in the in figure 11. 2.

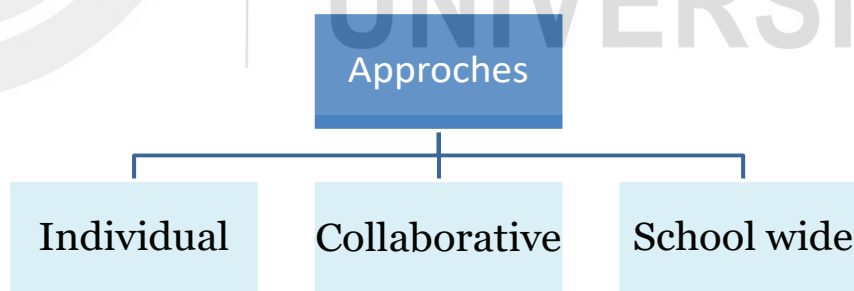


Figure 11. 2: Approaches to Action Researches

If we try to see the distinction amongst these approaches, then we may find that the difference amongst them is based on the level at which these researches are being performed. Now let's discuss them one by one.

Individual Approach: Research is usually taken up by the individual teacher herself/himself as per the requirement under this approach. It is mainly undertaken to understand and improve their classroom practices. In this research teachers often choose issues that are unique to their classroom settings. Since the teachers are individually undertaking the research, due care has to be taken on their part to construct or employ research tools that help them in collecting authentic information pertinent to the problem under study.

For example a teacher facing the problem of absenteeism in her class, and this problem is particularly related to that teacher, therefore, she will try to take it at her level. Hence, this type of research is placed under individual teacher research.

Collaborative Approach: As the name suggests this type of action research is usually done in collaboration or a team. Where a group of teachers collaborates to work towards a classroom, school problems, etc. here the problem chosen for the study is usually common to a group of teachers and they try to study and understand it to address the issue. In other words, we can say that this type of action research is preferred by the teachers having shared goals to address common problems/issues.

For example, the majority of the students in a class of a school are truant and generally run away from the class in the last period. Despite several warnings, the problem is not solved. So, all the teachers associated with that class decided to find out the reason and tried to adjust the last period to different weekdays; they come together and tried to work in collaboration to find a solution to the problem, hence, this is collaborative.

School-wide Approach: The school-wide action research, focuses on the areas which are common to the entire school or common to a large group of population. So most of the teachers and administrators of the school identify an issue or a problem and try to understand and work together to address it with a common focused goal in mind. Such type will fall under a school-wide approach to action research.

For example, let's consider a case, there is a music shop near the school campus and the music shop keeper plays music loudly, the disturbance of the sound effected almost all the classes of the school and students are unable to concentrate on their studies. The staff members may come together to raise their voices against the problem and find a solution.

Pause & Reflect

Given below are the two different problems, try to find out which approach of action research is suitable to address the problems?

- ❖ In a Maths competition organized by a local agency for elementary level learners, every time X school comes last. _____
- ❖ In spite of the extra classes, and extra inputs given by the subject teacher, Raman has again failed in Hindi subject. _____

Check Your Progress 4

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

8. What are the different approaches to action research?

.....

.....

.....

.....

9. What do you understand by the collaborative action research approach?

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.....
.....

11.8 STEPS INVOLVED IN CONDUCTING ACTION RESEARCH

As you are aware that research is a process and certain steps are required to undertake. Similarly, action research is also a type of research and for undertaking the same there are a few steps that can be used/ followed by the teachers in any action research, which are given below:

Identify a problem – the teachers in the above researches tried to identify the problem, to deal with effectively and this should be the first step in any action research. This step involves collecting information about the classroom events/ incidents, individual/subject to be studied through observation or through collecting information in many ways, such as through interviews, questionnaires, or recordings of lessons.



Specifying the problem is the next step and refers to detailing or pinpointing the research in question or the research being taken up for study. One needs to draft the problem very clearly. After one has specified the problem, the researcher has to list the probable causes of the problem.



Listing probable causes of the problem – This step involves writing all the possible causes which may be the reason for the problem. In this a teacher is usually required to take note of all the reasons that might be working behind the problem.



Hypothesizing – after listing the causes, a teacher finally settles down with one of the causes as the potent one and chooses/selects that particular cause to formulate the hypothesis. S/he under this heading is trying to look for the probable solutions or the tentative hunch to the problem.



Action plan – after the formulation of a hypothesis, one needs to develop a detailed action plan. This detailed action plan requires that the teacher conducting the investigation should write down the things which are to be done/undertaken, what strategy will be adopted by the teacher? How it will be executed? * how she

will record the evidence, (since recording evidence is an important and integral part of action research it will be discussed separately in next section) how much time is required to complete the task/study? what all resources will be required to accomplish the task? etc. This detailing out the activities will ease out the process and would fetch better results.



Interpretation of the result- this is the last step where the teacher/ investigator is required to write the conclusion based on the action plan that has been executed. In this section teacher probably, can find the solution to the problem in question.

So, the steps involved in conducting action research can be represented as given in figure-11.3.

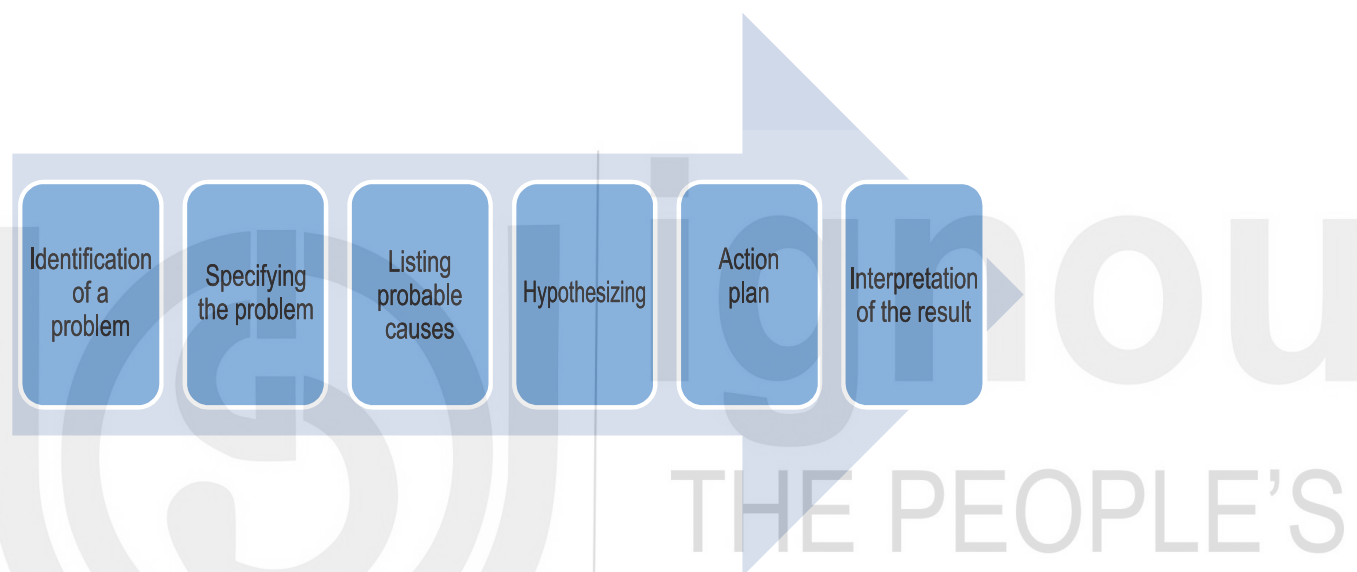


Figure 11.3: Steps in an Action Research

*(Note: Here the term teacher has been used in place of the researcher as action research is **usually** undertaken by the classroom teacher to work and improve her/his immediate classroom problems.)

Pause and Reflect

- If a student disturbs a lot during the class, what would be your action/ strategy as an action researcher?

11.8.1 Recording Evidence in Action Research

In the process of conducting action research, teachers would require a variety of relevant evidence. Normally theses evidence could be collected through -testing and non-testing techniques. From these two types of techniques, there is a possibility of getting two types of data, viz., qualitative and quantitative. Qualitative evidence or data is in terms of ideas and quantitative is in terms of numbers. Under testing techniques, the evidence is obtained through administrating tests, questionnaires, inventory, rating scale, etc. Under non-testing techniques, the evidence is secured through observation or interview or informal talk or focused group discussion, etc.

Observation is one of the most important techniques of getting evidence or data to know the change/variation independent variable while conducting action research. To make a systematic recording of observations it is necessary to decide what exactly to be observed and recorded. There are normally two kinds of observations, namely spontaneous observation, and deliberate observation.

Spontaneous Observation: Spontaneous observation are not intentional, hence may be considered spontaneous. This observation is done randomly and as a result, there is a possibility of missing certain important aspects of learning behaviour.

Deliberate Observation: Unlike spontaneous observation, deliberate observation is well planned and intentional to collect necessary evidence about a learner's learning behavior. As it is intentional, recording procedures could be systematically planned. There are different devices for recording the observations. Some of the important devices are as follows

- Anecdotal Records
- Observation schedule
- Checklists
- Rating scales

Anecdotal Records: One of the important tools to record the observation is an anecdotal record. This is an open description of an event or a learning situation that is observed. There are different formats used in the anecdotal records. Normally, observations are recorded on a card with the incident on one half and interpretation on the other half of the card.

Observation Schedule: In an observation schedule the aspects to be observed and recording criteria should be indicated. The first column of an observation schedule indicates the behavioral indicators proposed to be observed. In the second column, the recording criteria of observation are to be indicated. An illustrative observation schedule is given below to determine students' participation in a mathematics class.

Class: Mathematics

Date:.....

Area of Observation: Student's participation

Name of the Observer:.....

S.No	Behaviour to be Observed	Temporal Sequence		
		Beginning	Presentation	Closure
1.	Attention Distraction			
2.	Following instruction and responding to questions			
3.	Talking with other students			
4.	Sitting passively			
5.	Recording Black board Summary			

Students' performance could be observed with the help of the above schedule. These observations reveal useful information about attention distraction, instruction receptivity, parallel activities, etc. during the mathematics period in a classroom situation.

Checklist: A checklist is a list of statements or items describing the steps involved in the performance of the most important elements of a product. If the teacher wishes to evaluate the performance of students, a checklist with a set of statements describing the steps should be prepared.

Rating Scale: Checklists indicate the presence or absence of an attribute, but rating scales would help in evaluating the quality of performance. A rating scale consists of two parts a statement or an item and a set of response options continuum. The statement or items describes the characteristics to be judged and the response options continuum indicates the proficiency attained by a checklist. The performance of students in various school subjects could better be evaluated through rating scales. Let us see an example of a rating scale that may be used to observe and evaluate the various components of *writing*.

S.No.	Attribute	Rating				
		Poor	Satisfactory	Fair	Good	Excellent
1	Grip					
2	Posture					
3	Stroke					
4	Size of letters					
5	Neatness					

So, we can say that recording is one of the important components of action research. The entire process of action research is futile if the evidence is not properly recorded.

After discussing the different aspects of action research lets us try to develop detailed action research to have a better understanding with the help of an example.

The Problem of Anxiety related to Mathematics

Mathematics anxiety can be named as the feeling of stress that interferes with the manipulation of numbers and solving mathematical problems in a wide variety of ordinary life and academic situations. This anxiety makes one forget and lose one's self-confidence. And this anxiety affects mathematics-related tasks and typically occurs in a classroom. Hence, unless the teacher successfully curbs this anxiety of students s/he cannot make her students enjoy learning mathematics. Therefore, it is imperative to know a method to curb mathematical anxiety among students.

Identification of Problem

Kavita joined as a mathematics teacher in a school. She was assigned classes 6th and 7th. After teaching for a few days she noted a problem or anxiety and lack of interest in mathematics among students of class 7th'. Therefore, she decided to find out the root cause of the problem by conducting research.

Specifying the Problem

After teaching some days at class 7th “A” she came to know that the maximum number of students are not much interested in mathematics. To analyze the reason or cause i.e. why they are not interested in studying mathematics, she thought of analyzing the problem. For this, she checked their periodic assessment performance sheets and was very surprised to see that the maximum number of students have got poor/low marks in mathematics. At first instance, even she could not understand, why the maximum number of students got poor marks in maths though it is considered to be a scoring subject. Before concluding, she decided to confirm herself. Hence, she thought of observing them, their performance and identified certain causes of students’ problems.

Listing probable causes

Some of the observations she made are mentioned underneath.

Cause - 1

She observed during her teaching that students lack mathematical understanding, which may be because they were not clear with their basic concepts. They got confused in simple multiplication, division, etc. So, they experienced a high rate of anxiety as they are progressing to higher classes.

Cause - 2

They fear mathematics because they feel embarrassed when they give incorrect/wrong answers. They feel ashamed and shy a lot, that’s why majority of students do not participate in discussion until they are forced to do so.

Cause - 3

While observing a class she also noticed that only first benchers were paying attention and this was taking place in one of the senior teachers’ classes. This made to think that it was necessary to capture the interest of students. When she discussed the matter with other teachers, she believed that students lack interest in a study due to the no-detention policy and lack of attention given at home. As students knew that they will be promoted to the next class without passing the exam then why bother was the attitude.

Cause -4

She also observed that students experience mathematics anxiety and lack of interest in the traditional way of teaching and learning. Students fear to ask questions to clarify their doubts which may be the main cause of mathematical anxiety among students.

Cause -5

Teachers’ traditional way of teaching is another cause.

Specifying the Problem

So, the above observations/causes gave her enough thought to formulate the problem as mentioned below:

‘To study the mathematics anxiety among the students of class 7th of Campion school “

Objectives of the Study

- To study the causes of mathematics anxiety among students of class 7th;
- To study the interest of students towards mathematics as a school subject;
- To find out possible solutions to overcome the mathematics anxiety among students; and
- To give tentative suggestions to enhance students' interest in mathematics as a school subject.

Hypothesizing/hypotheses

- Students' mathematics anxiety may be overcome by changing teaching methods.
- Mathematics anxiety may be reduced by using concrete manipulative real-life examples while teaching mathematics in the classroom.
- Mathematics anxiety may be reduced by adopting collaborative teaching and learner-centered methods.
- Interest in mathematics subject may be improved by activity and participatory methods.

Action Plan (on one of the best hypotheses) for this student chose to work on the third hypothesis which reads as – 'Mathematics anxiety may be reduced by adopting collaborative teaching and learner-centered method'.

For this, the teacher divided the class into four groups and gave an activity to each group related to one of the mathematics topics. Each group was supposed to do the activity and note down their findings. Based on the activity teacher also gave them some questions and the students were supposed to find out the answers to the questions after discussion with their group members. They were then asked to explain what they found by doing that activity. All the group members were supposed to participate and contribute to the activity. After each group's presentation the teacher asked other group members to add on to the explanation of a particular group if they have anything to add. After giving chance to all the students of different groups' teacher further added to the content and explained it once again. But throughout the activity, it was students who were working in collaboration. This working in groups/collaboratively released the fear of mathematics amongst students and they were with less anxiety about mathematics. Moreover, they were happy to learn mathematics on their own along with their peers. So, the teacher benefitted, by adopting a collaborative method of teaching mathematics to the students.

After completion, the teacher would like to know that the effort which she made or the method which she employed during the mathematics class of 7th 'A' delivered a positive outcome for students or not? If it worked, she may conclude as one of the fruitful methods, if not, she would have to think about other hypotheses. This is the reason why this entire process of action research is known as a *cyclic process*.

Interpretation of the Result

Here the teacher analyzed the information which she collected during her action plan to deduce the result from the gathered information. So, the data and

information gained through the study, revealed that working in collaboration did work and the students were feeling less anxious as compared to earlier, i.e., before intervention. Therefore, it may be concluded that collaborative strategies worked well in reducing mathematical anxiety amongst seventh-grade students of Campion School.

Now, I am sure the above example would help you to devise an action plan in any subject/area.

Pause & Reflect

Maths is considered as a ‘howdah/ nightmare’ by many students. It is a school subject that many students try to avoid. So how will you solve the problem of math anxiety amongst students?

Activity for Practice

To get a clear understanding of the action research procedure let’s try to do the following activity:

Suppose the students of your class are unable to answer the higher-order questions, i.e., the questions of comprehension and application-level then what will be your take as a teacher. Draft a research problem on the above issue.

1. Title of the Research Study

.....

.....

2. Introduction

.....

.....

a. The rationale of the study.

.....

.....

b. Explanation of the Key Terms

c. Review of related literature on the proposed problem/issue/topic

.....

.....

d. Objectives of the study

.....

.....

e. Hypotheses of the study

.....

.....

3. Research Design

This includes the method adopted for the study, tools employed for data collection, and the steps for conducting the action research.

a. Research Method

.....

.....

b. Tools for Recording Evidences

.....

.....

c. Procedural steps for conducting research

(Give a detailed description of the different steps that you would be adopted to conduct this particular research)

.....

.....

Check Your Progress 5

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

10. List the devices or tools used for recording observation in action research.

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11. What is the difference between spontaneous observation and deliberate observation?

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12. What is the meaning of an 'action plan' in the process of action research?

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11.9 LET US SUM UP

It is a well-known fact that each learning situation is unique and cannot be handled in any formulaic /common method. The teacher has to see herself/himself not only as an information giver but as an organizer of learning and learning experiences. For this, the teacher should know how to cope up successfully and adjust effectively with the changing trends and needs of the classroom and learners. A teacher should also be trained thoroughly so that she understands the nature of classrooms, as it is today and as it is likely to develop in the future, for this he/she might have to do a lot of research as to how to improvise on her teaching-learning process. So, the researches which helps a teacher to understand and to improve the teaching-learning process are action researches. Hence, in this unit we have discussed some important 'Wh' questions related to the action research, viz., the concept of action research; the characteristics of action research, the difference between action and other educational researches, the steps involved in action research, devising an action research plan, examples of action research. Hope this unit will enable you to be a good reflector and deal with any action-oriented problem effectively in a specific solution like a classroom.

11.10 UNIT END EXERCISES

1. What should a teacher do to find a solution to a specific problem she comes across during the teaching-learning process?
2. What are the basic steps in which action research can be accomplished?
3. What are the characteristics of action research?
4. Devise a plan/steps/ strategies to combat the increasing use of mobiles in class.
5. How does action research contribute to improving the teaching-learning situation?

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11.12 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

1. Action research is a process especially adopted for improving the teaching-learning situation. It is a deliberate, solution-oriented investigation that is done in a group or personally.
2.
 - a. Kurt Lewin
 - b. Action research
 - c. Reflective
 - d. Action research
 - e. Classroom practices
3. Five Cs': commitment, collaboration, concern, consideration, and change
4. Please refer 11.5
5. It helps in creating a conducive environment for teaching and learning. It enables teachers to study and analyze the problem.
6. Please refer 11.6
7. Please refer 11.6
8. Individual approach, Collaborative approach, and School-wide approach
9. This type of action research is usually done in collaboration or a team. Where a group of teachers collaborates to work towards a classroom, school problems, etc.
10. Test, Questionnaire, Inventory, Rating Scale, Observation, Interview. Informal Talk. Focused Group Discussion
11. The action plan requires that the teacher conducting the investigation should write down the things which are to be done/undertaken, what strategy will be adopted by the teacher? How it will be executed? * *how she will record the evidence*, how much time is required to complete the task/study? what all resources will be required to accomplish the task? etc.
12. Spontaneous observations are not deliberate. This observation is done randomly and as a result, there is a possibility of missing certain important aspects of learning behaviour. Deliberate observation is well planned and intentional to collect necessary evidence about a learner's learning behavior. As it is intentional, recording procedures could be systematically planned.

UNIT 12 IMPLICATIONS OF RESEARCH FOR EDUCATIONAL PRACTICES

Structure

- 12.1 Introduction
- 12.2 Objectives
- 12.3 Need of Research for Improving Educational Practices
- 12.4 Survey Research and Educational Practices
- 12.5 Utility of Case-Studies in Improvement of Practices
 - 12.5.1 Case Study as a Teaching Learning Tool
 - 12.5.2 Case Study as a Research Method
- 12.6 Action Research: Solution to Specific Issues
- 12.7 Experimental Research for Improving Educational Practices
- 12.8 Role of National Achievement Survey in Improvement of Practices at Various Levels
- 12.9 Evaluation of Project/Scheme to Improve Educational Practices
- 12.10 Let Us Sum Up
- 12.11 Unit End Exercises
- 12.12 References and Suggested Readings
- 12.13 Answers to Check Your Progress

12.1 INTRODUCTION

Every research has specific scope and significance. The objectives and purpose of any research study, you may find that they are of various types and have different purposes. Some are for knowledge generation and some may be aimed at finding solution for the existing problems. In the field of education too, you will find researches which have given origin to new theories or improve the existing pedagogies, assessment practices, etc. In this unit, you will be explained with examples of research studies and their implications in general and for educational practices in particular. These are being used to improve and create additional/new educational practices. The unit will highlight various types of researches like - survey research, case-studies, action research, National Achievement Surveys, programme evaluation researches of some project/scheme with certain examples mainly with the help of major findings, so that you may be able to develop an understanding about their applications in improving educational practices. The unit will also highlight the need of such researches and role of policy makers and educational managers/administrators to utilize such research findings in improving, enriching and creating educational practices.

12.2 OBJECTIVES

After completion of the unit, you will be able to:

- describe the role of research for educational processes/teaching-learning;
- discuss the need of educational researches for innovation, creating and improving in educational practices;
- appreciate the need for applying the findings of various surveys to improve classroom practices;
- expose to examples of case-studies and action researches for improving teaching-learning;
- examine the finding of national achievement survey;
- analyze the utility of central and state governments' schemes and project evaluation reports; and
- appreciate the educational researches for improving teaching-learning practices.

12.3 NEED OF RESEARCH FOR IMPROVING EDUCATIONAL PRACTICES

Every society faces revolutions, discoveries, inventions which are part and parcel of society for its sustainability, progress and adaptations. Similarly, in the present context, you have witnessed a number of new changes and developments around you. You are already aware that in the constitution of India, the right to education (2010) to all children of the age group 6-14 years is already granted. UNESCO's agenda on Sustainable Development Goal-2030 has also set new targets for universalization of secondary education, inclusive education and life-long learning. Similarly, Rights of People with Disabilities (RPWD) Act, 2016 has advocated more inclusive educational settings in our formal education. New educational goals have been set up in the National Education Policy-2020. All these recommendations/suggestions have an impact on the educational scenario of the country. The Covid-19 pandemic has also demanded some unprecedented adjustment in the entire teaching-learning system globally. In such situations, how to make teaching-learning more effective, useful and affordable to all learners, is the key concern for policy makers and administrators. But the question is, how to find the most appropriate, feasible and cost-effective solutions? How to decide, which solution is better and under what circumstances? To find the best possible answers of all such questions, research is the only requirement. Educational policy makers and administrators, practitioners, leaders, teachers, all take help of research to find out the possible solutions at their end. In a nut-shell, the need for educational research for improving educational practices is as follows:

Enhancing knowledge: The basic purpose of educational research is to enhance the knowledge base and add something new in the existing pool of knowledge, which is meaningful and useful. For example, researches have led to the emergence of new learning theories and every theory tries to explain the knowledge creation in a way that is justified and acceptable socially.

Understanding learners and their needs: The focus of each and every education process is the learners, their development, their psychological, social

and educational needs, their individual differences, their pace of learning and style of learning, their attitude, interests, aspirations, etc. These are the core areas of research for educational researchers. You will come across many studies in these areas around the world.

Comprehending Disciplines and Subjects: In educational research, disciplinary knowledge is still not a popular field of research, you may find people teaching science, but cannot answer a basic question, i.e. What is Science? Same is the case of various other disciplines and subjects. How a discipline grows? How does it make its distinct place? What are its characteristic features? These are some questions which may find answer only through research.

Establishing effectiveness of methods and strategies: One very common area of educational research is to find out the effectiveness of a new method, strategy, instructional design and so on. Many experimental and quasi experimental researches are common in this field. Many do comparative studies of two or more methods in different situations, or for various sectors and levels of education system.

Solutions of day-to-day classroom problems: The most common form of educational research among teachers and other educational practitioners is action research. Action research is generally being done to find out localized- class specific/school/institution specific solutions of day-to-day problems being faced by a teacher/group of teachers. Such researches are more contextualized and have very limited generalizability.

Examining effectiveness of assessment practices/strategies: Assessment has always remained an area of concern in education. As educational practices are evolving, assessment strategies also. A lot of researches are being done in the field to examine effectiveness of practicing new/innovative assessment strategies/tools. In the contemporary context, technological interventions in assessment are also an emerging and challenging area of educational research.

Integrating technologies and innovations in educational processes: Technological interventions in education have grown at a faster pace. Now, technology has become part and parcel of educational practices. It has been found that still there is lot of inertia towards adopting new and emerging technologies in the system. In this regard, NEP-2020 has emphasized focus on researches in future disruptive technologies. Many practitioners have come up with various innovations which may be localized at the initial stage but have wider applicability, which can be accepted, utilized and established only through strong research.

These points might have helped to realize that for different purposes, one kind of research alone would not work. In coming sections, we will be discussing some of the major types of researches and their purposes with some common examples.

Activity 1

This list is endless, you may consider above points as beginning points and start thinking about application of findings of educational researches in various domains, which can help in improving educational practices. Enlist some of your explored areas in the space given below:

.....

.....

.....

Check Your Progress 1

- Note: a) Write your answers in the space given below.
b) Compare your answer with the one given at the end of the Unit.

1. Why do we need research to improve educational practices?

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.....

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.....

12.4 SURVEY RESEARCH AND EDUCATIONAL PRACTICES

You might have come across through newspaper as well as in media reports in which some data from such reports have been presented either graphically or statistically to acquaint you with some ground realities. Many such reports are outcome of survey researches. The government agencies like NCERT, NSSO, NIEPA or NGOs like Pratham are some popular names, which conduct educational surveys and publish their reports in public domain. Newspaper articles given below are based on some excerpts from such reports.

NATIONAL Annual Status of Education Report flags poor learning outcomes in schools

SPECIAL CORRESPONDENT

NEW DELHI, January 19, 2019 (IANS)

UPDATED: January 19, 2019 12:24 IST

SHARE ARTICLES f t g e PRINT A A A



Children of Government Higher Primary School at Ballabhi village in T. Nagar taluk engaged in digital learning.

'Cognitive skills can help rural students'

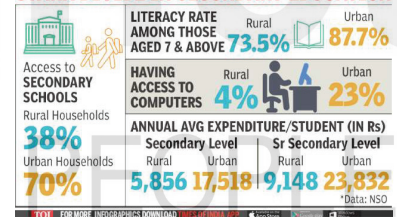
Only 16% of children in Class 1 in 26 surveyed rural districts can read text at the prescribed level, while almost 40% cannot even recognise letters, according to the Annual Status of Education Report (ASER) 2019, released by NGO Pratham on Tuesday.

Only 41% of these children could recognise two digit numbers.

However, ASER found that the solution is not to spend longer hours teaching children the 3Rs.

Counter-intuitively the report argues that a focus on cognitive skills rather than subject learning in the early years can make a big difference to basic literacy and numeracy abilities.

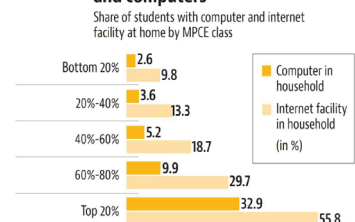
STARK DIVIDE IN SECONDARY EDUCATION



<https://timesofindia.indiatimes.com/india/23-of-urban-population-has-access-to-computers-only-4-of-rural-survey/articleshow/77075283.cms>

CHART 1B Students in richer households have better access to internet and computers

Figure 12.1: Some



Note: Data for 3-35 year old persons attending education in 2017-18

screenshot of survey reports excerpts published in media

Source:

<https://www.thehindu.com/news/national/aser-flags-poor-learning-outcomes-in-schools/article30569671.ece>

Source:

<https://www.hindustantimes.com/india-news/issues-facing-online-education/story-SaG9rbmlRjRnALWqPspjII.html>

Figure 12.1: Some Screenshot of Survey Reports Excerpts Published in Media

You have already been acquainted about survey as a research method in unit nine of the course, let us now try to understand, what is its purpose in education?

Can you reflect, why the data has been quoted in NEP-2020?

Read following two examples taken from National Education Policy-2020.

Example 1

6.2.1. According to U-DISE 2016-17 data, about 19.6% of students belong to Scheduled Castes at the primary level, but this fraction falls to 17.3% at the higher secondary level. These enrolment drop-offs are more severe for Scheduled Tribes students (10.6% to 6.8%), and differently abled children (1.1% to 0.25%), with even greater declines for female students within each of these categories. The decline in enrolment in higher education is even steeper.

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Example 2

7.1. According to U-DISE 2016–17 data, nearly 28% of India's public primary schools and 14.8% of India's upper primary schools have less than 30 students. The average number of students per grade in the elementary schooling system (primary and upper primary, i.e., Grades 1–8) is about 14, with a notable proportion having below 6; during the year 2016–17, there were 1,08,017 single-teacher schools, the majority of them (85743) being primary schools serving Grades 1–5.

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If you read the relevant sections of the policy, you will find that the data has been used to highlight the ground realities of the educational system in the country and tried to suggest the remedies as policy recommendations.

The data given in section 6.2.1 has been used to give a realistic picture of education in Social-Educational Disadvantaged Groups (SEDGs) and used to justify the need of special educational provisions for children from SEDGs to reduce dropout. Similarly, the data given in the section 7.1 has been used to justify the need of school complexes for optimal utilization of resources and better governance. This reflects that survey research outcomes/findings not only affect the implementation of existing policies and schemes but also provide a base to formulate changes/modifications in the existing policies, provisions and schemes in education.

Basically, there are mainly three types of surveys:

1. **Large scale sample surveys:** These surveys studies are undertaken/ conducted by a national or state level body with the large population. National Achievement Survey (NAS), u-DISE (conducted by NIEPA) and International base line Survey are examples for this. Findings of such studies provide a base for policy making.
2. **Regional/localized surveys:** These survey studies focus on a small population and the purpose is to understand the ground realities and to

examine effectiveness of certain interventions. For example, a survey to assess the effectiveness of providing bicycles to girl students on the completion of a certain level of education (elementary/secondary) in a particular state.

3. **Survey as a part of academic research:** These type of survey researches are generally the part of a course of study or a funded research by some agency. Such studies are conducted in naturalistic settings to collect data and test hypotheses as part of research studies. For example, to study the problems faced by learners with disabilities in commuting to their schools in the district south east Delhi.

Check Your Progress 2

Note: a) Write your answers in the space given below.

b) Compare your answer with the one given at the end of the Unit.

2. Write at-least three uses of survey for improving educational practices in your own words?

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12.5 UTILITY OF CASE-STUDIES IN IMPROVEMENT OF PRACTICES

Case studies are a qualitative research method that focus on one unit of study (Merriam, 1998).

Case studies are the tools, which are being used not only as a research method but also as a teaching learning tool. In the following sub-sections we will discuss about both these dimensions and also highlights, how the findings/outcomes of such studies are relevant for improving the educational practices.

12.5.1 Case Study as a Teaching-Learning Tool

Case studies are being used as a teaching-learning tool as well as a research tool. Use of case study as a teaching tool, basically focuses on developing higher order thinking skills, analysing skills, problem solving skills, etc. among learners. Such case studies have their origin from real life situations and problems, thus provides a great tool for scenario based education and also in learning. You may find use of case studies as a teaching-learning tool in Education and also in other disciplines like social sciences, management, psychology, humanities, law, medicine, etc.

Case studies are handy tool for all the practitioners, generally, a teacher in classroom, either use already existing cases or create new ones on their own, while identifying or developing a case for teaching-learning purpose, a teacher keeps following things in mind:

- Expected learning outcomes while discussing the case
- Issues to be pointed out during the discussion
- Introducing the case/opening questions to learners for discussion
- Preparation on the part of students, nature of discussion (group/individual)
- Time needed for the discussion
- Ideas/concepts to be applied/extracted
- Assessment strategy

Benefits of Case Study as a Teaching-Learning Tool

- Most of the cases are based on real events, so they help in scenario-based learning.
- Learners think, analyse, explain and reflect, so it helps them in developing higher order skills.
- A same case or event can be viewed from different perspectives or angles by learners, so they develop an ability to look with multiple perspectives and respect others' views also.

12.5.2 Case-Study as a Research Method

Case study is considered as a qualitative research method. Stake (1995) defines case study as “the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances” (p. xi).

Merriam (1998), classified case studies as educational research into four main categories:

(1) Ethnographic	(2) Historical	(3) Psychological	(4) Sociological
Focus on how people behave in cultural settings, such as the culture within a classroom.	Use a variety of evidences to understand a context over time, such as the founding and development of a private school.	look at individuals and analyze their behavior, e.g. studies by Piaget on his own children.	Focus on social constructs and use demographics to analyze the case, such as socio-economic differences within a school.

**Figure 12.1: Types of Case-Studies In Educational Research
(Merriam, 1998)**

Being a small-scale method, it is feasible to conduct case study when scope of study is limited and very focused, i.e., up to a particular system, organization, process or person. It is believed that case studies are very useful in preliminary educational researches, where a rigorous description and explanation is required. Generally, case studies are used to find the answers of research questions with “how” and “why” with in-depth analysis or details. If you explore various case study researches in educational settings, you may come across two types of case-

studies, i.e., institutional/organizational case studies and Individual oriented case studies, which are explained with the following examples.

Successful School Management in India: Case Studies of Navodaya Vidyalaya

A case-study was conducted to explore the management devices in Navodaya schools (GoI funded residential schools in rural areas). Three schools were chosen for case-study on the basis of the academic performance of students, and their participation in co-curricular activities at the regional and national levels. Researchers used triangulation approach, i.e., data were collected through various methods like, personal interviews, observations, and questionnaires/schedules from various stakeholders (principals, teachers, students, parents, and alumni). Researchers concluded that these schools are practicing participative management model to run the schools. People have given autonomy but also made accountable for successful completion of the tasks. These schools are following democratic approach for decision making, giving due preference to the welfare of students, maintaining supportive relationship with teachers, developed continuous linkage with parents, etc. It was also found in the study that these schools have setup higher goals, adopted innovative pedagogical methods and evaluation devices, and recognized good work of the teachers.

Source: Khaparde, M. & Srivastava, A. & Meganathan, R. (2004). *Successful School Management in India: Case Studies of Navodaya Vidyalayas*. *Educational Research for Policy and Practice*. 3. 243-265. 10.1007/s10671-005-4418-2.

Effectiveness of Online Grievance Redressal and Management System: A Case Study of IGNOU Learners

This case-study is an example of an institutional practice adopted by IGNOU i.e., Online grievance redressal systems to facilitate learners in ODL system, which are residing at faraway places and do not have access to any opportunities to get their grievances resolved.

Study analysed the functioning, acceptance and effectiveness of an online grievance redressal and management mechanism (iGRAM) to handle learners' grievances. Researchers used survey as a method to collect data, including demographic questions, statements regarding effectiveness.

Study concluded that majority of learners were satisfied with this online grievance redressal and management system of IGNOU, but they have suggested few additions/changes, like development of mobile app based iGRAM portal, address the issue of non-receipt of study material and to put efforts to popularize it.

Source: Tripathi, U. N., Srivastava, A. K., Singh, B. P. (2021). *Effectiveness of Online Grievance Redressal and Management System: A case study of IGNOU Learners*, *Indian Journal of Educational Technology*, 3 (02), p. 102, https://ciet.nic.in/IJET-Journal/IJET_July_2021_Volume3_Issue2/mobile/index.html

After reading above two examples, you can easily conclude that institutional case-studies can be used effectively to improve institutional policies and practices in the following ways:

- Evaluating the effectiveness of any innovative practice or adoption
- Institutional best practices and their wider applications
- Effectiveness of schemes and policies in a particular situation
- Impact of contextualization in educational practices.

Activity 2

On the basis of your understanding, enlist some benefits of institutional case-study research for educational practitioners in the space given below:

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Case Studies on Individuals

Along with institutional case-studies, a number of researches you will find where a case study of an individual (student/teacher/head of the institution) have been carried out. In the area of inclusive education/special education, such case-study researches are more common. Let us see two such examples:

Raj (2020). A CASE STUDY OF A CHILD WITH SPECIAL NEED/LEARNING DIFFICULTY

This is example of a case-study conducted to investigate the levels and kind(s) of difficulty the child/student is facing in learning in or outside the classroom. In this, study, the researcher has also examined the relationship between the school and the home environment of a learner with special needs who is facing difficulty in learning i.e., reading, writing, listening or speaking.

Researcher not only directly observed the learner but also collected information with the help of discussion and questionnaires from teachers, peer groups from the school as well as in the home environment, parents and family members.

The researcher found that the child under study was not having any slow learners like problem nor she is shy or uninterested in learning by nature but she loves to read, learn, take part in different activities. On the other hand, she is having a creative mind by birth or nature but only the problem of her difficulties in learning is because of the depression she has laid in her mind related to the home environment and improper treatment given to her by parents, family, teacher's, elder's in the school or at home.

Source: <https://www.ijcrt.org/papers/IJCRT2012225.pdf>

FROM STARTING TO REACHING - A CASE STUDY OF A SPECIAL CHILD

A Journey to Stare Then Reach - A Case Study of a Special Child

This is a story of a little angel in the school Durgabhai Deshmukh Vocational Training and Rehabilitation Centre. The mother of the little angel is a homemaker while her father was working at a press. Little angel was the first child of her parents and was born on 19th March 2012. She was born normally like any other child.

But later she had to become a special child because of her health issues. At the age of 3 months, she had pneumonia due to which her growth got delayed. Doctors titled her problem as Global Developmental Delay. Her parents happened to notice this as the child was not meeting the development milestones on time.

She was not able to roll, crawl, sit or stand. She was always in her mother's lap. She had to stare at all things although she wanted to reach them. She even had a squint in her eyes. She had to undergo eye surgeries at a very young age of one year. Later, advised by doctors to go for Physiotherapy her parents came with the child to DDVTRC. They approached the school on 27-6-14. She was soon put up in the physiotherapy department.

Physiotherapists trained the child initially for rolling, creeping and crawling. In the starting days, the child was not at all cooperative. Later she got adapted with it and soon she started learning all the movements and exercises taught to her. She learnt rolling, creeping, crawling and sitting in the very first few months. Later she was taught kneeling, half-kneeling and standing. The child achieved these in four months.

Once her functional activities were improved, she was trained for walking. As she learnt walking, she even improved her hand functions and finger grasp. She was now able to hold all the things, which she only stared at earlier. In the sixth month of her training, she started walking and climbing stairs with wall support.

Source: <https://vikaspedia.in/education/parents-corner/guidelines-for-parents-of-children-with-disabilities/steps-to-prevention-of-disability-in-children>

Above examples of individuals indicate that at-times, case study reveals the truth which is not directly observable by a teacher or a guardian. As in the case of example one, in which a child was leveled as a child with special needs without any valid reasons or diagnosis.

Individual case-studies are very important tool to understand the learners behaving differently due to various reasons.

Check Your Progress 3

Note: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

3. Do you think, case-studies can be an effective research method for improving educational practices? Write your reflections in 50 words

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12.6 ACTION RESEARCH: SOLUTION TO SPECIFIC ISSUES

In education, action research is one of the commonly used and most important classroom practices, which aims to solve day-to-day problems of educational practitioners. You have already gone through the unit-11 'Understanding Action Research' and are well aware of the steps, process and merits. In this section, let us see a few examples in which action research method has been used to improve educational practices.

Action researches are being used to improve the educational practices, to improve the understanding about various practices already in place and to improve the situation/environment, where a practice will take place. (Carr and Kemmis, 1986)

While going through various action researches, you may find that most of such researches originate from a question/problem associated with educational practitioner experiences. It can be a classroom problem, an institutional/school related issue or any administrative/management issue of whole educational zone/district.

But, one thing is true about action researches that such studies have limited generalizability and are used to find the solution to localized or specific problems by the teachers/practitioner themselves. It helps them to reflect on the situation, explore and examine various aspects, find tentative solutions, apply most appropriate solution and see the effectiveness in order to improve the teaching-learning scenario.

Action based researches and their findings can be used to reach certain solutions for the existing school/classroom-based problems. Solutions to one problem may not be the end of all problems with in the school system. There could be further problems that come up in the process that are to be addressed. Action research is thus a continuous and reflective process.

Two examples are given below to provide more clarity about action researches.

Improving Students' Ability in Problem-Solving in "Principles of Accounting"

The researcher explored the ways to improve students' ability to solve numerical problem based questions in 'Principles of Accounting' course, in which they were facing difficulties. Researcher conducted the study on 12 students of his class facing difficulties in doing these questions. He used methods like focus group discussion with peer teachers, Interviews with students, analysis of students' test papers, and preliminary tests to identify the research issue. He used tutoring and problem-solving assignment as Action Strategies. Three levels of action interventions were carried out, first with the tutoring strategy, second with the problem-solving assignment, and the third with a combination of both. Graded problems selected from standard textbooks were used to conduct the pre and post-strategy tests, which revealed marked improvements in performance of the subjects. Rubrics analysis indicated quality improvement in 'problem understanding', 'procedure of generating solution', and 'neatness and clarity in presentation of answers'.

Source: Kannan (2014). *Action Research on Improving Students' Ability in Problem-Solving in "Principles of Accounting"*, *HuSS: International Journal of Research in Humanities and Social Sciences*, 1(2), 89–98, <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.891.8305&rep=rep1&type=pdf>

Why this Kolaveri about Teaching Vowel Sounds at HKG Level?

Researcher noticed an aggressive rage or haste (kolaveri) among parents in India to teach spoken English (especially, in English medium schools) because of the increasing demand of urban elite and middle-class parents to make their wards learn fluent English. Parents coming from economically weaker sections of society, too, have become aware of the importance of English due to media exposure, including social media. The article is based on teaching vowel sounds (through one of the English textbooks) to children at the higher kindergarten (HKG) level at a public school in Jaipur. The first part of the paper discusses how the teaching of vowel sounds is undertaken at this level through the textbook, Step Up with English Primer. This is followed by a discussion on how teaching from such books can distort the very foundation of students and induce inappropriate learning style in them. The paper emphasises teaching of sounds as these are considered to be the base of spoken English.

Source: Arora and Arora (2017) *Why this Kolaveri about Teaching Vowel Sounds at HKG Level?* *The Primary Teacher*, 42 (02), p. 5, <https://ncert.nic.in/pdf/publication/journalsandperiodicals/theprimaryteacher/PRT-APRIL17.pdf>

The above two examples are showcasing two different scenarios. In the first example, a teacher noticed some difficulty in the accounting class with a few learners and planned an action research.

He executed the action plans and find the solution. In the second example, due to social expectations and parental pressure, a teacher designed an action plan to improve the learning outcomes of learners in English language speaking.

Check Your Progress 4

- Note: a) Write your answers in the space given below.
b) Compare your answer with the one given at the end of the Unit.

4. If you are asked to conduct action research, what precautions you will take while planning action research?

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12.7 EXPERIMENTAL RESEARCH FOR IMPROVING EDUCATIONAL PRACTICES

Read the following two examples to find the role of experimental research in finding solutions to specific issues:

Comparative Study of Effectiveness of Fishbowl Strategy in Synchronous and Asynchronous Mode of Online Learning

This is a study aiming at finding effectiveness of Fishbowl Strategy in Online learning. It is a discussion oriented, unique strategy with the potential of imparting rich learning experience to the learners.

Here it is essential to remember that both synchronous and asynchronous modes of online learning offer different ways for interacting with peers. Thus, it is essential to study both the modes, which can support the strategy and help learners to get maximum benefit from it. In order to study this aspect, 'Two Experimental Groups Pre-test and Post-test design' was used. The study was conducted on higher education teachers across the country. Learners were expected to participate in the discussion willingly hence the purposive sampling technique was used. Wiziq Virtual classroom and Google Groups were used as Synchronous and Asynchronous platforms respectively. Statistical analysis of the achievement test scores indicated effectiveness of strategy in both the modes equally. This research is giving an insight regarding planning Cooperative Learning activity using online learning platforms for better learning experience. Also, it gives perspective regarding utilizing both Synchronous and Asynchronous modes of Online Learning with equal ease. Along with the significant increase in the achievement, Fishbowl strategy helps enhance higher order thinking and other cognitive abilities of the learners. It allowed participants to interact with each other, understand different perspectives and analyse group discussion before precisely expressing their own view points. They have suggested that more cooperative learning strategies can be tested in online learning environments in synchronous as well as a synchronous environments.

Joshi, M. & Shinde, J. (2021). Comparative Study of Effectiveness of Fishbowl Strategy in Synchronous and Asynchronous Mode of Online Learning, Indian Journal of Educational Technology, 3(02). 263-276, [https://ncert.nic.in/pdf/publication/journalsandperiodicals/indian journal of educational technology](https://ncert.nic.in/pdf/publication/journalsandperiodicals/indian%20journal%20of%20educational%20technology)

Boosting Science Self-efficacy of Eighth Graders through Cooperative Learning

The study was conducted to compare the effect of the cooperative learning techniques (JIGSAW IV and STAD) on science self-efficacy of VIII graders with different cognitive styles. The data was collected from a set of 240 students of VIII graders randomly chosen from three government schools of Chandigarh. Pre-test, post-test with one control group design was used and the data obtained was subjected to 2-way Analysis of Variance. The major findings of the study were:

- The field-independent and field dependent group of students yielded a significant difference in the mean difference on science self-efficacy scores. Field-dependent students exhibited better science self-efficacy than field-independent students.
- Students exposed to cooperative learning strategies JIGSAW IV and STAD exhibited better science self-efficacy than the students belonging to conventional group. Among the two cooperative learning strategies, students belonging to JIGSAW IV yielded better science self-efficacy scores than students belonging to STAD and control group.

Study concluded that Indian classrooms can be made a better place to learn by introducing cooperative learning strategies through regular activities of evaluation like formative tests to train students in aspiring according to their competence.

As much group activities can be planned in classrooms to enhance science self-efficacy of students creating a situation of dependence on the others for success. Students can be taught to take responsibility of others learning by promoting group study. Self-study in groups, project work and assignments should be recommended as a mode of learning. If implemented properly, cooperative learning strategies can certainly bring about a change in the scenario of Indian science classrooms.

Thakur and Thakur (2020). Boosting Science Self-efficacy of Eighth Graders through Cooperative Learning, *Journal of Indian Education*, 45 (04). 71-90, [https://ncert.nic.in/pdf/publication/journals and periodicals/journal of indian education/JIE-February2020.pdf](https://ncert.nic.in/pdf/publication/journals%20and%20periodicals/journal%20of%20indian%20education/JIE-February2020.pdf)

While going through above two examples, you must have noticed that experimental researches are trying to establish a cause-effect relationship. In example one, the researchers have analyzed the effectiveness of fishbowl teaching-learning strategy in the two modes of online learning, i.e., synchronous and asynchronous. Such studies are relevant in the contemporary educational scenario because online teaching learning is growing at a rapid pace and teachers require to find out the most appropriate teaching -learning strategies to be used in online mode. Similarly in the second example, the researchers have studied the effectiveness of the cooperative learning strategies for increasing the self-efficacy of the learners. This study is also relevant because in the constructivist approach, the cooperative learning strategies are preferred over behaviorist methods. It is important to establish that which cooperative learning strategy is more suitable in particular class/ subject/situation.

It is often said that experimental researches are the most valid approach to find the solution of the educational problems.

You will find that in the experimental researches there are a variety of settings like field experiments (conducted in a real-life settings), laboratory experiments (in a controlled environment) and internet experiment (in online mode). The biggest advantage of the experimental researches that a researcher can control, manipulate and observe the effect of one or more variables on others. If you go through the literature, you can easily find out that experimental researches are helping a lot in innovating, improving and adding quality in the classroom processes. Not only a researcher but many teachers also prefer to experiment with new methods/ media/ strategies for betterment of teaching-learning.

12.8 ROLE OF NATIONAL ACHIEVEMENT SURVEY IN IMPROVEMENT OF PRACTICES AT VARIOUS LEVELS

As a result of Universalisation of Elementary Education (UEE), Government of India has undertaken number of initiatives/ intervention to provide primary/ elementary education under District Primary Education Programme (DPEP), Sarv Shiksha Abhiyan (SSA), etc. In order to study their effectiveness in terms of student learning achievement, in 2017, Government of India decided to conduct a comprehensive survey of educational achievement of school children, because many private agencies and NGOs have been conducting surveys of different sample sizes and their findings were highlighted glaring the learning performance among children.

In order to obtain a system level reflection, Ministry of Human Resource Development (MHRD, now renamed as MoE), conducted a large-scale survey named as National Achievement Survey (NAS), in which a national representation was ensured. It was conducted for Classes 3, 5 and 8 in government and government aided schools in the country.

In this survey, the tools used multiple test booklets with 45 questions in Classes III and V and 60 questions in Class VIII in Mathematics, Language, Sciences and Social Sciences. NCERT, developed the competency-based test questions, based on the Learning Outcomes identified earlier. In this first NAS, the learning levels of 2.2 million students from 1,10,000 schools across 701 districts in all 36 States/union territories (UTs) were assessed.

In 2021, it is also proposed to conduct NAS for classes III, V, VIII and X.

Key Characteristic Features of NAS

- a sample based National Achievement Survey (NAS) for classes III, V, VIII and X with a cycle period of three years.
- a competency based national-level large scale assessment, conducted to provide information about the learning achievement of students.
- objective is to have a system level reflection on effectiveness of school education in the country and to provide information on system performance levels and related or contributing factors.

Benefits of NAS

- Findings help compare the performance across spectrum and across population in order to find the desirable direction for improvements.
- The findings of the survey, help to guide education policy, planning and implementation at national, state, district and classroom levels for improving learning levels of children and bringing about qualitative improvements.
- Provide a snapshot of what students know and can do at the end of Classes 3, 5, 8 and 10 by measuring students' attainment of LOs in the respective classes.
- Will be useful for educational planners and policy makers including researchers in understanding the interdependence of assessment, pedagogical process and learning outcome in improving the quality of education.
- Will help in systematic understanding of the consequences that prolonged closure of schools has had on students' learning in terms of their socio-emotional and cognitive development.
- Results will help to accurately discover the students' performance in different learning outcomes vis-à-vis the contextual variables.
- Capacity building of teachers, mid-level officials, DIETs, SCERT and other officials through the diagnostic report cards.
- It will enable to track the future progress in context of National Education Policy 2020.

12.9 EVALUATION OF PROJECT/SCHEME TO IMPROVE EDUCATIONAL PRACTICES

Researches in educational field are also conducted to assess the effectiveness of any project or scheme. Such researches are being conducted from time-to-time by various state, national and international agencies. In order to comprehend it with more clarity, a few such evaluation studies, their purpose and outcomes have been given here in brief.

Example 1: Comprehensive Evaluation of Centrally Sponsored Scheme on Restructuring and Reorganization of Teacher Education, an evaluation study by NCERT (2009).

This study was carried out by NCERT in 2009 which examined the capacity and functioning of the DIETs, CTEs, IASEs and SCERTs (commonly known as centrally sponsored schemes for teacher education) in all the states/UTs of India in terms of:

- (a) availability, adequacy and utilization of physical infrastructure and staff,
- (b) pre-service, in-service programmes, research, innovation, development and extension activities,
- (c) adequacy and utilization of financial assistance (central and state),
- (d) monitoring and evaluation procedures followed for ensuring efficiency and effectiveness of the institution and
- (e) networking with national, regional, state, district and sub-district level institutions/organizations involved in school education and teacher education.

Study also focussed on assessing the functioning of different departments/units to fulfil the mandate of the Teacher Education Schemes and examined the schemes since its implementation, in the context of the changes that have taken place in school and teacher education sectors.

On the basis of findings, study has recommended modifications in the existing guidelines of the scheme including reorganization of the internal structures of the institutions to meet present educational challenges, and new roles for the institution to be performed in the next 10 years and the immediate and long-term action plan needed for strengthening their capacity. Major recommendations were related to restructuring of the TEIs, upgrading DIETs and linking these with universities to cater to all stages of school education from pre-primary to senior secondary; establishing Block Level Institutes of Teacher Education (BITEs) for in-service training for teachers from pre-primary to senior secondary stages.

Example 2: Evaluation of Sarv Shiksha Abhiyan (SSA), Planning Commission, Government of India, 2010.

The Programme Evaluation Organisation (PEO), Planning Commission evaluated SSA to review the progress in terms of its objectives and related targets. The study also tried to assess the extent to which the approaches/strategies adopted under SSA have been effective, to identify the bottlenecks in the implementation of the scheme and suggest the way forward to design future programmes and policies.

The study has highlighted some important achievements in terms of access to education. More than 98% of the sampled rural habitations have access to elementary schools within 3 Kms. While 93% of sampled slum children have access to neighbourhood schools within 1 Km.

A positive picture that has also come into light by the study, relates to social and gender equity. It has been found that despite prevalence of gender bias, there has been an improvement in enrolment of girls with gender parity ratio of 0.89.

The quality of education imparted to children is a real major concern under SSA. It has been observed that there has been moderate improvement in Pupil-Teacher Ratio (PTR), availability of infrastructure facilities and awareness among parents regarding SSA.

According to the study, there are still some outstanding issues, which need to be addressed such as shortage of upper primary schools in both rural and urban areas, mainstreaming of “out of school children” and “dropouts”, seasonal migration, weak monitoring and supervision linkages and quality of education imparted especially in the States of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh.

The study recommended to open more upper primary schools and develop stronger linkages of pre-primary schools with primary schools in villages, reforming the school curriculum to make it more child friendly, multi-lingual schools with multi-graded textbooks and designing academic calendar in sync with migratory seasons, no-detention policy to be followed by all states at primary level and examinations to be replaced by continuous assessment.

Many more recommendations were there, which have helped in effective implementation of mandate given by the RTE Act-2009 and an outcome was revised SSA framework in 2011.

The above examples technically fall under evaluation research. Sometimes, it is also referred as programme evaluation. Such researches serve the specific purpose to evaluate or access the performance, effectiveness and utility of any scheme/programme with respect to its objectives, investment, time, etc. The nature of research may be quantitative, qualitative or mix methods as per need of the study. Most of such researches are comprehensive in nature, require bigger sample size and outcome of team efforts. Such researches help in improving practices, decision making about continuation of project or scheme, policy interventions, etc. the benefits of such researches can be summarised as follows:

- Help in getting an insight about the progress and current status of a project/scheme.
- Many educational schemes/projects when evaluated after a long time, the impact of changes taken place during course of time forces for improvement in practices, in which findings of such researches help.
- Help to access the effect of a particular scheme/interventions.
- Outcomes help in understanding the extent to which targets/objectives have been achieved.

Check Your Progress 5

Note: a) Write your answers in the space given below.

b) Compare your answer with the one given at the end of the Unit.

5. Identify at-least two schemes/projects in the area of education, where you think an evaluation study is required. Also justify your selection of the scheme/project for evaluation.

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12.10 LET US SUM UP

Research is not just an area of study. It is a continuous process and practice. Its need is to understand the importance for improving educational practices. Various benefits of education researches to improve the education practices and explained various common forms of researches, which are being used particularly survey is the most common form of research in educational field,

and examples have been given of various surveys that how these are reported and what kind of impact they brought in policy making, two excerpts from National Educational Policy-2020 have been given to establish this fact. Case-study is being used as a teaching-learning method as well as a research method. More focus has been given in unit to brought out the research method case-study and examples of institutional case studies and individual case studies from published researches/reports have been given, which will help to develop your understanding about the utility of case-study. Action research is considered as a practitioners' research, and examples given in the unit will help to find out the ways to use it to improve educational practices at localized level. Unit also highlighted the importance and outcomes of the National Achievement Survey (2017) and planning of National Achievement Survey (2021), such surveys are providing strong foundation for national educational initiatives. Unit also highlighted the importance of evaluation research or programme evaluation in education with the examples of evaluation studies done by NCERT and the Planning Commission of India. At present, Niti Aayog is taking such initiatives. We are sure now you got a compressive view about the application and utility of various types of researches in improving educational practices.

12.11 UNIT END EXERCISES

1. Why do we require research for improving educational practices? Justify with suitable examples.
2. Identify the government agencies involved in the process of research and evaluation for betterment of educational practices in India. Highlighted at-least one such study/research done by the agency (avoid examples already given in the unit).
3. What is the importance of case-study and action research for a teacher as practitioner? Give one example of each, which you want to carry as an educational practitioner and justify your selection.

12.12 REFERENCES AND SUGGESTED READINGS

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12.13 ANSWERS TO CHECK YOUR PROGRESS

1. Write your own reflections.
2. Write in your own words.
3. Write your own reflections.
4. Identify the precautions to be followed based on reading of section 12.6.
5. Explore websites of various government agencies involved in education and complete the answer.