e- CONTENT FOR POSTGRADUATE COURSE

(INTRODUCTION TO RESEARCH METHODOLOGY)

- **PROGRAMME : M.Ed. Special Education**
- **Course : Introduction to Research Methodology**
- **Module 1: Introduction to Research**
- **Module 2 : Types & Methods of Research**
- **Module 3 : Sampling**
- **Module 4 : Preparing Research Proposal & Report**

SHYAM SUNDER MISHRA

(Director & Head, Department of Special Education)

Nehru Gram Bharati (Deemed to be University) Prayagraj (UP)
www.ngbu.edu.in /e mail: ssmishra05@gmail.com

INTRODUCTION TO RESEARCH METHODOLOGY

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INTRODUCTION :

- ❑ The Course aims to develop within the students a temperament for scientific thinking and research.

- ❑ It orients the students to the methods of conducting research, analysis of data and enables him/her to prepare research proposal and report subscribing to the standard norms and criteria.

OBJECTIVES :

- ➤ **After completing the course teacher educators will be able to:**
- ❑ Develop a conceptual understanding of research, its need and ethical research practices.

- ❑ Describe the types, methods and process of research.

- ❑ Explain the methods and techniques for analysis of data.

- ❑ Explain the methods and techniques of qualitative research.

- ❑ Prepare research proposal and report.

UNIT: 1

INTRODUCTION TO RESEARCH

- ➢ **DEFINITION**
- ➢ **OBJECTIVES**
- ➢ **ROLE OF THEORY**
- ➢ **TYPES**
- ➢ **CHARACTERISTICS**
- ➢ **STEPS**
- ➢ **NEED In SPECIAL EDUCATION**
- ➢ **CODE OF ETHICS**
- ➢ **PRINCIPLES**

INTRODUCTION TO RESEARCH

1.1: Knowledge:

Information from the senses is called empirical knowledge and empiricists believe that the fundamental source of all knowledge is our senses. Our senses are exploratory organs;

- ❑ We use them all to become acquainted with the world we live in.
- ❑ We gain knowledge through our experience & intelligence. We are curious by birth.
- ❑ Our curiosity, eagerness, education & industriousness increases with quantum of knowledge.
- ❑ It is our eagerness which motivates us to make organized & planned efforts.
- ❑ Research is the outcome of this motivation.
- ❑ The knowledge multiply by the results & conclusions is drawn from the research.
- ❑ We carry out research to verify the previous knowledge.

1.2: Sources of acquiring knowledge:

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

a) Learned Authority:
- ❑ Human beings refer to an authority such as a teacher, a parent or the boss or an expert or consultant and seek his / her advice.
- ❑ Such an authority may be based on knowledge or experience or both.

❑ For example, if a child has difficulty in learning a particular subject, he / she may consult a teacher.

❑ Learned authority could also be a book / dictionary / encyclopedia / journal / web-site on internet.

b) Traditions:

❑ Human beings easily accept many of the traditions of their culture or forefathers.

❑ On the other hand, students, in case of admission criteria and procedures, examination patterns and procedures, methods of maintaining discipline, co-curricular activities, acceptable manner of greeting teachers and peers rely on school traditions.

❑ Long established customs or practices are popular sources of acquiring knowledge.

❑ This is also known as tenacity which implies holding on to a perspective without any consideration of alternatives.

c) Experience:

❑ Our own prior personal experiences in matters of problem-solving or understanding educational phenomena is the most common, familiar and fundamental source of knowledge.

d) Scientific Method:

❑ In order to comprehend and accept learning acquired through these sources, we use certain approaches.

1.3: Philosophy of knowledge:

In epistemology a common concern with respect to knowledge is what sources of information are capable of giving knowledge. Some of the major sources of knowledge;

❑ **Perception** — that which can be perceived through the experiences of the senses. The view that experience is the primary source of knowledge is called empiricism.

❑ **Reason** — Reason can be considered a source of knowledge, either by deducing truths from existing knowledge, or by learning things.

❑ **Introspection** — knowledge of one's self that can be found through internal self-evaluation. This is generally considered to be a sort of perception. (For example, I know I am hungry or tired.)

❑ **Human Memory** — Memory is the storage of knowledge that was learned in the past — whether it be past events or current information.

❑ **Testimony** — Testimony relies on others to acquire knowledge and communicate it to us. Some deny that testimony can be a source of knowledge, and insist that beliefs gained through testimony must be verified in order to be knowledge.

1.4 Sources & Philosophy of knowledge:

We gain knowledge through our experience & intelligence. We are curious by birth and our curiosity, eagerness, education & industriousness increases with quantum of knowledge. It is our eagerness which motivates us to make organized & planned efforts. Research is the outcome of this motivation and the knowledge multiply by the results & conclusions is drawn from the research. Thus, we carry out research to verify the previous knowledge.

Knowledge is obtained first & on the basis of this knowledge, research is carried out. It is not whole truth that one obtains knowledge only through research. Knowledge can be obtained without research also. Several methods of obtaining knowledge are found in literature:

❑ Tenacity Method

❑ Authority Method

❑ Priori Method

❑ Scientific Method

1.5 : Role of theory in Research:

❑ A theory is an attempt to develop a general explanation for some phenomenon.

❑ A theory defines non observable constructs that are inferred from observable facts & events and that are thought to have an effect on the phenomenon under study.

❑ A theory describes the relationship among key variables for purposes of explaining a current state or predicting future outcomes.

❑ A theory is primarily concerned with explanation and therefore focuses on determining cause-effect relationships.

❑ John Dewey once said that there was nothing more practical than a good theory.

1.6 Definition of Research:

It basically refers to a search for knowledge. It is a scientific & systematic search for pertinent information on a specific topic. it may also be labeled as an art of scientific investigation.

It is a careful investigation or inquiry specially through search for new facts in any branch of science.

-**Advanced Learner's dictionary**

❑ Systematized effort to gain new knowledge.

- **Redman & Mory**

❑ A movement from the known to the unknown.

❑ It shows how to solve any problem scientifically.

❑ It is a careful enquiry through search for any kind of Knowledge.

❑ It is a journey from known to unknown.

❑ It is a systematic effort to gain new knowledge in any kind of discipline.

❑ When it seeks a solution of any educational problem it leads to educational research.

❑ Research purifies human life ad it improves its quality.
❑ Research comprises defining & redefining problems, formulating hypothesis or suggested solutions: collecting, organizing & evaluating data, making deductions and reaching conclusions and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis.

- **Clifford woody**

❑ Research is an original contribution to the existing stock of knowledge making for its advancement.
❑ The search for knowledge through objective & systematic method of finding solution to a problem.

1.7: Scientific approach :

The term 'Science" may be thought of as an approach to the gathering of knowledge rather than as a field or subject matter. It is consist of two primary functions;
❑ i) Development of theory
❑ ii)Testing of substantive hypothesis that are deducted from theory.
❑ **Scientist** therefore, are engaged in the use, modification, and/or creation of theory. Scientist may emphasize ;
❑ Empirical approach- (data collection is the primary method).
❑ Rational approach – (logical & deductive reasoning).
❑ Combination – (most common).

1.8: Characteristics of Scientific Method:
Scientific research is systematic, controlled, empirical & critical investigation of hypothetical prepositions about the presumed relation about natural phenomena.

- **Kerlinger**

Steps in scientific study may include;

❑ Observation
❑ Classification
❑ Verification
❑ Generalization

Scientific method may include the below mentioned properties;

❑ Definiteness
❑ Objectivity
❑ Verifiability
❑ Generality
❑ Predictability
❑ Causation
❑ Systematic
❑ Logical
❑ Empirical
❑ Replicable

1.9: Definition of Educational Research:

Educational research is that activity which is directed towards development of a science of behavior in educational situation. The ultimate aim of such a science is to provide knowledge that will permit the educator to achieve his goals by the most effective methods.

- John W. Best

Educational research is defined as research that investigates the behavior of students, teachers, administrators, parents and other members of the community who interact with educational institutions. The word behavior is taken broadly to mean such phenomena as learning, attitudes, aptitudes, abilities, interests, practices, processes, emotions and so forth.

1.10: Objectives of studying Educational Research:

➢ To orient students to the nature of educational research: its purposes, forms, and importance.

➢ To provide information which helps students become more intelligent consumers of educational research: where to locate it, how to understand it and critique it.

➢ To provide information on the fundamentals of doing educational research such as selecting a problem, using available tools, organizing a project, etc

1.11: Types of Educational Research:

❑ **Historical**: (to describe what was)

❑ **Descriptive** (Quantitative): (to describe what is)

❑ **Qualitative**: (to describe what is)

❑ **Experimental** : (to describe what will be)

➢ **Ethnographic** - attempts to describe group behavior and interactions in social settings. It relies on qualitative techniques especially observation and careful recording of events and social interactions.

➢ **Historical -** attempts to describe and explain conditions of the past. It generally relies on qualitative data such as written documents and oral histories.

➢ **Descriptive** - attempts to describe and explain conditions of the present. It relies on qualitative and quantitative data gathered from written documents, personal interviews, test results, surveys, etc.

➢ **Correlational** - attempts to explore relationships or make predictions. It relies on quantitative data such as test scores, grade point averages, attitudinal instruments, etc. which can be correlated and shown that some relationship exists between or among them.

➤ **Action and Evaluation Research** - attempts to determine the value of a product, procedure, or program in a particular (e.g., school, district) setting with the goal of improving same. Action and evaluation research does not attempt to generalize results for a broader population.

➤ **Causal Comparative** - attempts to explore cause and effect relationships where causes already exist and cannot be manipulated. It relies on both qualitative and quantitative data such as written documents, interviews, test scores, etc.

➤ **Experimental** - attempts to explore cause and effect relationships where causes can be manipulated to produce different kinds of effects. It relies mostly on quantitative data such as test scores and measures of performance.

1.12: Characteristics of Educational Research
➤ It is highly purposeful.
➤ It deals with educational problems regarding students and teachers as well.
➤ It is precise, objective, scientific and systematic process of investigation.
➤ It attempts to organize data quantitatively and qualitatively to arrive at statistical inferences.
➤ It discovers new facts in new perspective. i. e. It generates new knowledge.
➤ It is based on some philosophic theory.
➤ It depends on the researchers ability, ingenuity and experience for its interpretation and conclusions.
➤ It needs interdisciplinary approach for solving educational problem.
➤ It demands subjective interpretation and deductive reasoning in some cases.
➤ It uses classrooms, schools, colleges department of education as the laboratory for conducting researches.

1.13: Steps involved in conducting Research :

No unique style, format is declared and no rigidity is found to determine the steps of educational research. However, there are some common character found almost on each research process and those could be considered as the steps of educational research. These are mentioned as under;

- ➢ Topic selection
- ➢ Literature review
- ➢ Identification of limitations in previous research
- ➢ Rationale
- ➢ Objective of the study
- ➢ Appropriate methodology
- ➢ Proposal writing
- ➢ Considering ethical points
- ➢ Tools development
- ➢ Data collection
- ➢ Validity and reliability of data
- ➢ Data collecting and finalizing
- ➢ Data analysis with appropriate techniques
- ➢ Writing the individual findings and then compare
- ➢ Recommendation
- ➢ Suggestion for further

1.14: Motives of Research:

- ❑ Intellectual joy
- ❑ Serving the mankind
- ❑ Unsolved problems
- ❑ Reputation
- ❑ Consequential benefits
- ❑ Need to understand
- ❑ Predictions
- ❑ Social growth
- ❑ National & International understanding
- ❑ Economic & Scientific progress
- ❑ Expectations & directions of employers
- ❑ Conditions & requirements of service

1.15: Need of Research in Education and Special Education:

- ❑ The general philosophy of special education is that all people have the ability to learn, regardless of their particular disabilities. The trend in public education has shifted from isolating special education students in separate classrooms to mainstreaming them in the regular classroom (Inclusive education).
- ❑ Education is constantly evolving, with educators and educational theorists involved in an ongoing search for innovative and effective methods and teaching strategies to meet the unique needs of each student.
- ❑ This approach is perhaps most essential in special education and the inclusive classroom.

❑ The inclusive classroom relies on the simultaneous use of differentiated instruction and assessment techniques for maximizing a student's learning potential by tailoring the teaching to every student.

❑ Although many educational innovations take shape and undergo testing in the classroom, research is necessary to substantiate these new techniques beyond anecdotal evidence.

❑ This helps broaden their exposure, boosts their inclusion in professional development programs for teachers, and encourages widespread implementation.

1.16: Code of Ethics:

➤ **Professional competence:** Competence to research is not only in terms of qualification but also intellectual capability. Often the acquiring of a Master's degree alone is not sufficient to certify that a person is fit and qualified to research. Before beginning a research the supervisor or sanctioning institution must ascertain that the researcher is competent to conduct research in the field chosen. But most importantly the researcher himself must be confident about his competence. Technical soundness of a research is the principal quality that is expected in a research. Teaching of research techniques and methodology is given special focus in all institutes conducting research as part of curriculum. It is expected that research methodology and techniques of research stay on with the researcher even after the completion of a research project. All future researches conducted by the researcher must demonstrate technical soundness.

➤ **Integrity:** Honesty, genuineness and fairness in research are expected from a researcher. Misrepresentation and deceit may help the research one time. But the blot of being an unethical research work never leaves the final product of the research.

➤ **Professional and scientific responsibility:** Research work is not carried out in isolation of the society. Societal dynamics

steer the research and also are affected by it. Research emerges from the problems that exist in society. Research deeply affects the solutions that are formed to eliminate these problems. It is a moral and professional responsibility of the researcher to be aware of effects of his research. It must always be borne in mind by the researcher that carelessness in the research may have long lasting effects on the future research in that field, and further on the society. Thus professional standards must never be compromised with.

➢ **Respect for peoples' rights, dignity and diversity:** Research must be free from bias and so must the researcher. The society is composed of diverse people often having conflicting rights. It is the responsibility of the researcher to incorporate the spirit of respect for all in the research and promote equality of rights in diversity of interests.

➢ **Social responsibility:** It is moral and professional obligation of researcher to conduct themselves and their research in such a way that is not disorderly to the society. As we have seen that research emerges from the society. It is expected that a researcher must give back to the society the knowledge that it has been able to bank through observation of the society itself. This knowledge is a potential for development and revamping of the society.

1.17: Principles of Ethics in Research:

➢ **Principle 1: Minimizing the risk of harm:**

❑ Dissertation research should not harm participants. Where there is the possibility that participants could be harmed or put in a position of discomfort, there must be strong justifications for this. Such scenarios will also require (a) additional planning to illustrate how participant harm (or discomfort) will be reduced, (b) informed consent, and (c) detailed debriefing.

❑ There are a number of types of harm that participants can be subjected to. These include:

❑ Physical harm to participants.

❑ Psychological distress and discomfort.

❑ Social disadvantage**.**

➢ **Principle 2: Obtaining informed consent:**

❑ One of the foundations of research ethics is the idea of informed consent.

❑ Simply put, informed consent means that participants should understand that (a) they are taking part in research and (b) what the research requires of them.

❑ Such information may include the purpose of the research, the methods being used, the possible outcomes of the research, as well as associated demands, discomforts, inconveniences and risks that the participants may face.

➢ **Principle 3: Protecting the anonymity and confidentiality:**

❑ Protecting the anonymity and confidentiality of research participants is another practical component of research ethics. After all, participants will typically only be willing to volunteer information, especially information of a private or sensitive nature, if the researcher agrees to hold such information in confidence. Whilst it is possible that research participants may be hurt in some way if the data collection methods used are somehow insensitive, there is perhaps a greater danger that harm can be caused once data has been collected. This occurs when data is not treated confidentially, whether in terms of the storage of data, its analysis, or during the publication process.

➢ **Principle 4: Avoiding deceptive practices:**

❑ At first sight, deceptive practices fly in the face of informed consent. After all, how can participants know

❑ (a) that they are taking part in research and

❑ (b) what the research requires of them if they are being deceived? This is part of what makes the use of deceptive practices controversial.

❑ For this reason, in most circumstances, dissertation research should avoid any kinds of deceptive practices.

➢ **Principle 5: Providing the right to withdraw:**

❑ With the exception of those instances of covert observation where is not feasible to let everyone that is being observed know what you are doing, research participants should always have the right to withdraw from the research process. Furthermore, participants should have the right to withdraw at any stage in the research process.

❑ When a participant chooses to withdraw from the research process, they should not be pressured or coerced in any way to try and stop them from withdrawing.

❑ If the supervisor expect the researcher to complete an Ethics Consent Form, it is likely that you will have to let participants know that they have the right to withdraw at any time

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UNIT: 2

TYPES & METHODS OF RESEARCH

- ➢ FUNDAMENTAL
- ➢ APPLIED
- ➢ ACTION
- ➢ QUANTITATIVE
- ➢ QUALITATIVE
- ➢ DESCRIPTIVE
- ➢ CORRELATIONAL
- ➢ EXPERIMENTAL

TYPES AND METHODS OF RESEARCH

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                    ┌─────────────────────────────┐
                    │     TYPES OF RESEARCH        │
                    └─────────────────────────────┘

     ┌────────────────┐   ┌────────────────┐   ┌────────────────┐
     │  APPLICATION   │   │   OBJECTIVES   │   │  ENQUIRY MODE  │
     └────────────────┘   └────────────────┘   └────────────────┘

         ( PURE )         ( DESCRIPTIVE )       ( QUANTITATIVE )
         ( APPLIED )      ( EXPLAROTARY )       ( QUALITATIVE )

                          ( CORRELATIONAL )
                          ( EXPLANATORY )
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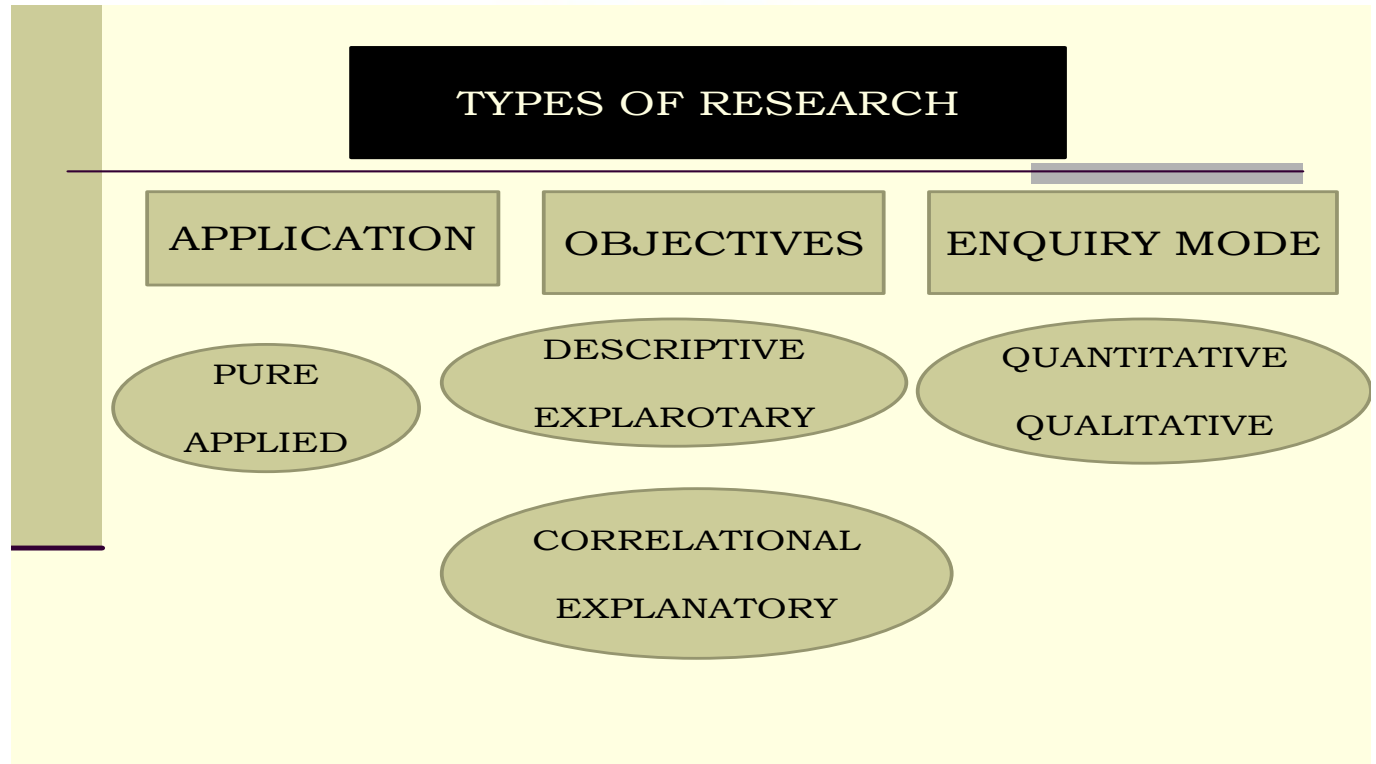
2.1 : Classification based on various parameters:

❑ Objectives of research : (Fundamental/Applied/Action)

❑ Research findings: (Factual/theoretical/Applied)

❑ Research methods: (Historical/Descriptive/Experimental)

❑ Nature of research: (Descriptive/Analytical/Action)

❑ Research approach : (Qualitative/Quantitative/Mixed)

❑ Nature of data: (Conceptual/Empirical)

❑ Workplace: (Library/Field studies/Laboratory)

❑ Sponsors: (Govt. funded/Institutional funded/self funded)

❑ Researchers: (Individual/group)

Types of Research

QUANTITATIVE		QUALITATIVE
FUNDAMENTAL		APPLIED
ACTION		

2.2 : Types of Research:

2.2.1: Fundamental Research:

➢ It is basic approach which is for the sake of knowledge. Fundamental research is usually carried on in a laboratory or other sterile environment, sometimes with animals.

➢ This type of research, which has no immediate or planned application, may later result in further research of an applied nature. Basic researches involve the development of theory. It is not concerned with practical applicability and most closely resembles the laboratory conditions and controls usually associated with scientific research.

➢ It is concerned establishing generally principles of learning. For example, much basic research has been conducted with animals

to determine principles of reinforcement and their effect on learning. Like the experiment of skinner on cats gave the principle of conditioning and reinforcement.

➢ According to Travers, basic research is designed to add to an organized body of scientific knowledge and does not necessarily produce results of immediate practical value.

➢ Basic research is primarily concerned with the formulation of the theory or a contribution to the existing body of knowledge. Its major aim is to obtain and use the empirical data to formulate, expand or evaluate theory.

➢ This type of research draws its pattern and spirit from the physical sciences. It represents a rigorous and structured type of analysis. It employs careful sampling procedures in order to extend the findings beyond the group or situations and thus develops theories by discovering proved generalizations or principles.

➢ The main aim of basic research is the discovery of knowledge solely for the sake of knowledge. The first type of research, which has its aim obtaining the empirical data that can be used to formulate, expand or evaluate theory is called basic research. This type of study is not oriented in design or purpose towards the solution of practical problem.

➢ Its essential aim is to expand the frontiers of knowledge without regard to practical application. Of course, the findings may eventually apply to practical problems that have social value. For example, advances in the practice of medicine are dependent upon basic research in biochemistry and microbiology. Likewise, progress in educational practices has been related to progress in the discovery of general laws through psychological, educational, sociological research.

2.2.2: 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. It is research performed in relation to actual problems and under the conditions in which they are found in practice.

➢ Through applied research, educators are often able to solve their problems at the appropriate level of complexity, that is, in the classroom teaching learning situations. We may depend upon basic research for the discovery of more general laws of learning, but applied research much is conducted in the order to determine how these laws operate in the classroom.

➢ This approach is essential if scientific changes in teaching practice are to be effected. Unless educators undertake to solve their own practical problems of this type no one else will.

➢ It should be pointed out that applied research also uses the scientific method of enquiry. We find that there is not always a sharp line of demarcation between basic and applied research. Certainly applications are made from theory to help in the solution of practical problems.

➢ We attempt to apply the theories of learning in the classroom. On the other hand, basic research may depend upon the findings of the applied research to complete its theoretical formulations. A classroom learning experiment can throw some light on the learning theory. Furthermore, observations in the practical situations serve to test theories and may lead to the formulation of new theories.

➢ Most educational research studies are classified at the applied end of the continuum; they are more concerned with ―what‖ works best than with ―why‖. For example, applied research tests

the principle of reinforcement to determine their effectiveness in improving learning (e.g. programmed instruction) and behaviour (e.g. behaviour modification). Applied research has most of the characteristics of fundamental research, including the use of sampling techniques and the subsequent inferences about the target population.

➢ Its purpose, however, is improving a product or a process – testing theoretical concepts in actual problem situations. Most educational research is applied research, for it attempts to develop generalizations about teaching – learning processes and instructional materials.

➢ The applied research may also be employed a university or research institute or may be found in private industry or working for a government agency. In the field of education such a person might be employed by a curriculum publishing company, a state department of education, or a college of education at a university. Applied researches are also found in the settings in which the application or practitioner's role is primary. This is where the teachers, clinical psychologists, school psychologists, social workers physicians, civil engineers, managers, advertising specialists and so on are found. Many of these people receive training in doing research, and they use this knowledge for two purpose:

• To help practitioners understand, evaluate, and use the research produced by basic and applied researches in their own fields and,

• To develop a systematic way of addressing the practical problems and questions that are as they practice their professions.

➢ For example, a teacher who notices that a segment of the class is not adequately motivated in science might look at the research literature on teaching science and then systematically try some of the findings suggested by the research.

➢ Some of the recent focus of applied educational research have been grading practices, collective bargaining for school personnel, curriculum content, instructional procedures, educational technology, and assessment of achievement. The topics have been investigated with an applied research because the questions raised in these areas generally have limited or no concrete knowledge of theory we can draw upon directly to aid in decision making.

2.2.3: Action Research:

➢ This kind of research is not confined to a particular methodology or paradigm. For example, a study of the effectiveness of training teenage parents to care for their infants.

➢ The study is based on statistical and other evidence that infants of teenage mothers seemed to be exposed to more risks than other infants. The mother and children were recruited for participation in the study while the children were still in neonate period. Mothers were trained at home or in an infant nursery. A controlled group received no training. The mothers trained at home were visited at 2-weeks interval over a 12-month period. Those trained in nursery setting attended 3-days per week for 6 months, were paid minimum wage, and assisted as staff in centre. Results of the study suggested that the children of both group of trained mothers benefited more in terms of their health and cognitive measures than did the controlled children. Generally greater benefits were realized by the children of the mothers trained in the nursery that with the mothers trained at home.

➢ Thus the study shows that such researches have direct application to real world problems. Second, elements of both quantitative and qualitative approaches can be found in the study. For example, quantitative measure of weight, height, and cognitive skills were obtained in this study.

➢ However, at the start itself from the personal impressions and observations without the benefit of systematic quantitative data, the researches was able to say that the mother in the nursery centre showed some unexpected vocational aspirations to become nurses. Third, treatments and methods that are investigated are flexible and might change during the study in response to the results as they are obtained. Thus, action research is more systematic and empirical than some other approaches to innovation and change, but it does not lead to careful controlled scientific experiments that are generalizable to a wide variety of situations and settings.

➢ The purpose of action research is to solve classroom problems through the application of scientific methods. It is concerned with a local problem and is conducted in a local setting. It is not concerned with whether the results are generalizable to any other setting and is not characterized by the same kind of control evidence in other categories of research.

➢ The primary goal of action research is the solution of a given problem, not contribution to science. Whether the research is conducted in one classroom or many classrooms, the teacher is very much a part of the process. The more research trainings the teacher involved have had, the more likely it is that the research will produce valid, if not generalizable research.

➢ The value of action research is confined primarily to those who are conducting it. Despite its shortcomings, it does represents a scientific approach to the problem solving that is considerably better than changed based on the alleged effectiveness of untried procedures, and infinitely better than no changes at all.

➢ It is a means by which concerned school personnel can attempt to improve the educational process, at least within their environment. Of course, the true value of action research to true scientific progress is limited. True progress requires the development of sound theories having implications for many classrooms, not just one or two. One sound theory that includes ten principles of learning may eliminate the need of hundreds of

would – be action research studies. Given the current status of educational theory, however, action research provides immediate answers to problem that cannot wait for theoretical solutions. As John Best puts it, action research is focused on immediate applications.
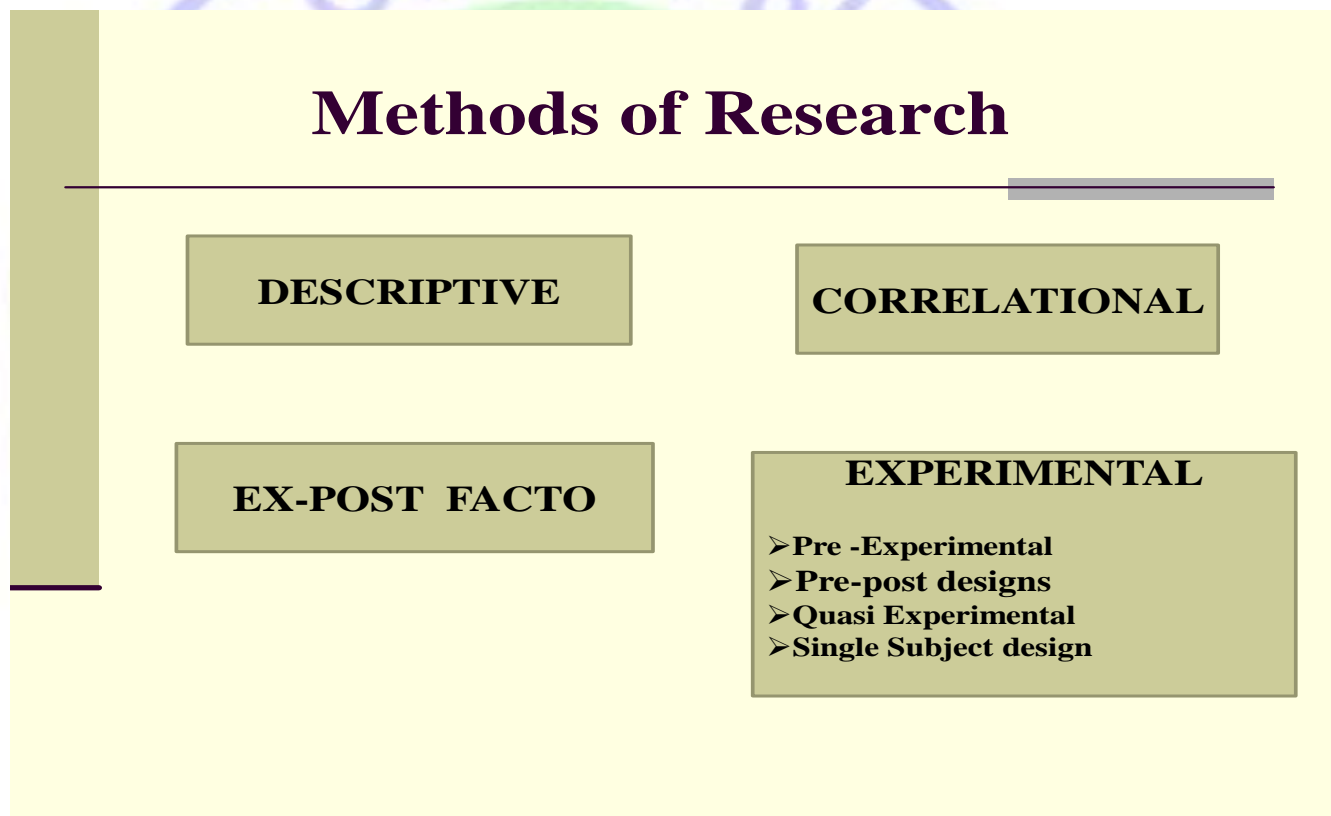
➢ Its purposes is to improve school practices and at the same time, to improve those who try to improve the practices, to combine the research processes, habits of thinking, ability to work harmoniously with others, and professional spirit. If most classroom teachers are to be involved in research activity, it will probably be in the area of action research.

➢ Many observers have projected action research nothing more than the application of common sense or good management. Whether or not it is worthy of the term research it does not apply scientific thinking and methods to real life problems and represents a greater improvement over teachers' subjective judgments and decision based upon stereotype thinking and limited personal experience.
➢ The concept of action research under the leadership of Corey has been instrumental in bringing educational research nearer to educational practitioners.
➢ Action research is research undertaken by practitioners in order that they may attempt to solve their local, practical problems by using the method of science.

2.2.4: Quantitative Research:
➢ Quantitative research is for cases where statistical conclusions to collect actionable insights are essential.
➢ Numbers provide a better perspective to make critical business decisions. Quantitative research design methods are necessary for the growth of any organization.
➢ Insights drawn from hard numerical data and analysis prove to be highly effective when making decisions related to the future of the business.

2.2.5: Qualitative Research:

➢ Determines relationships between collected data and observations based on mathematical calculations.

➢ Theories related to a naturally existing phenomenon can be proved or disproved using statistical methods. Researchers rely on qualitative research design methods that conclude "why" a particular theory exists along with "what" respondents have to say about it.

2.3 : Methods of Research:

Methods of Research

DESCRIPTIVE

CORRELATIONAL

EX-POST FACTO

EXPERIMENTAL
➢Pre -Experimental
➢Pre-post designs
➢Quasi Experimental
➢Single Subject design

2.3.1: Descriptive Method:

❑ In a descriptive design, a researcher is solely interested in describing the situation or case under their research study.

❑ It is a theory-based design method which is created by gathering, analyzing, and presenting collected data.

❑ This allows a researcher to provide insights into the why and how of research. Descriptive design helps others better understand the need for the research.

❑ If the problem statement is not clear, you can conduct exploratory research.

2.3.2: Correlational Method:

❑ Correlational research is a non-experimental research design technique that helps researchers establish a relationship between two closely connected variables.

❑ This type of research requires two different groups. There is no assumption while evaluating a relationship between two different variables, and statistical analysis techniques calculate the relationship between them.

❑ Researcher measures two variables, understands and assess the statistical relationship between them with no influence from any extraneous variable.

2.3.3 : Experimental Method:

❑ Attempts to explore cause and effect relationships where causes can be manipulated to produce different kinds of effects. It relies mostly on quantitative data such as test scores and measures of performance.

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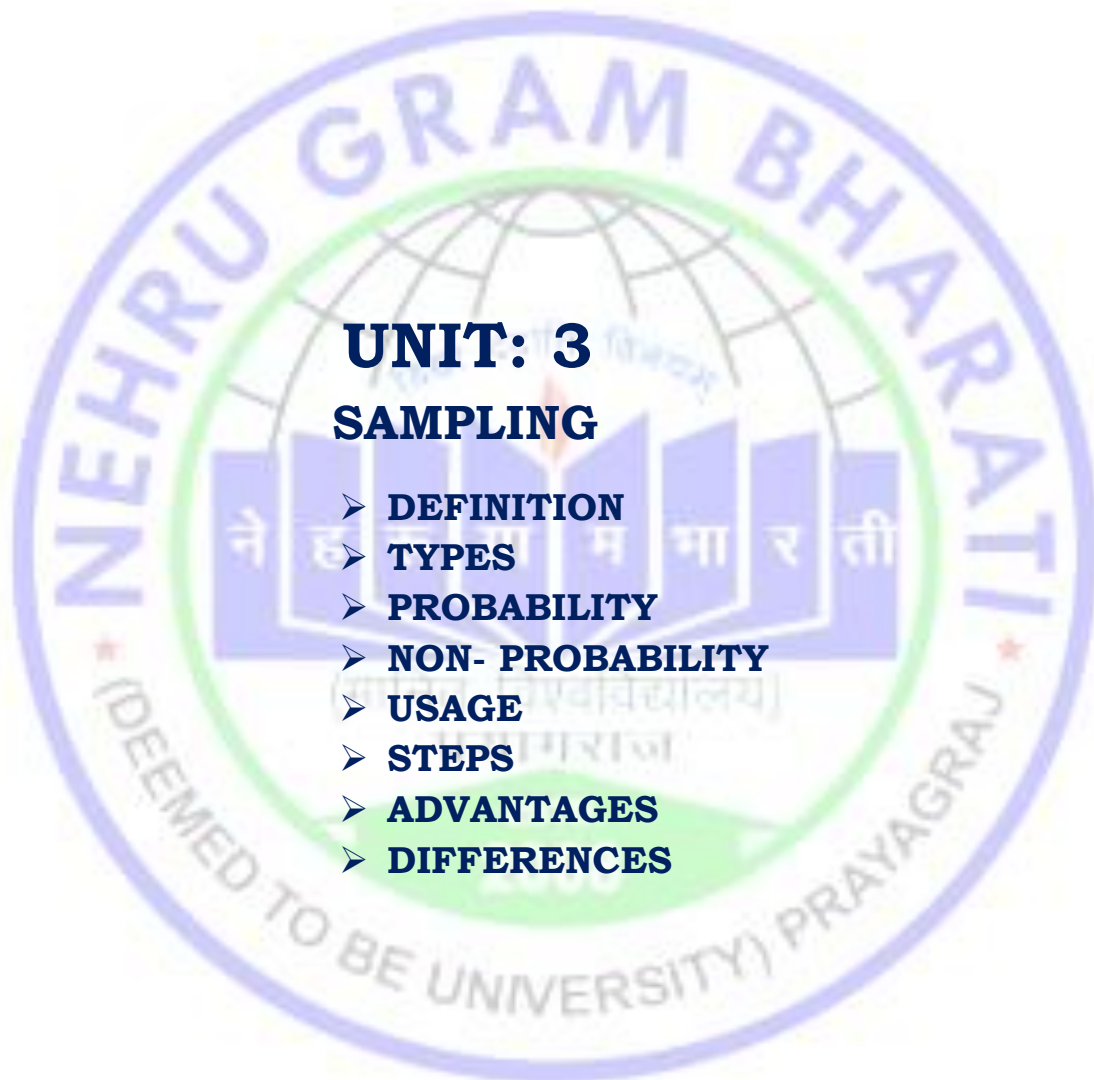
UNIT: 3
SAMPLING

- ➤ **DEFINITION**
- ➤ **TYPES**
- ➤ **PROBABILITY**
- ➤ **NON- PROBABILITY**
- ➤ **USAGE**
- ➤ **STEPS**
- ➤ **ADVANTAGES**
- ➤ **DIFFERENCES**

SAMPLING

3.1: Definition of Sampling:

➤ Sampling is defined as the process of selecting certain members or a subset of the population to make statistical inferences from them and to estimate characteristics of the whole population.

➤ Sampling is widely used by researchers in market research so that they do not need to research the entire population to collect actionable insights.

➤ It is also a time-convenient and a cost-effective method and hence forms the basis of any research design.

➤ For example, if a drug manufacturer would like to research the adverse side effects of a drug on the population of the country, it is close to impossible to be able to conduct a research study that involves everyone. In this case, the researcher decides a sample of people from each demographic and then conducts the research on them which gives them an indicative feedback on the behavior of the drug on the population.

3.2: Types/Methods of Sampling:

➤ **Probability Sampling:** Probability sampling a sampling method that selects random members of a population by setting a few selection criteria.

➤ These selection parameters allow every member to have the equal opportunities to be a part of various samples.

➢ **Non-probability Sampling:** Non probability sampling method is reliant on a researcher's ability to select members at random.

➢ This sampling method is not a fixed or pre-defined selection process which makes it difficult for all elements of a population to have equal opportunities to be included in a sample.

3.2.1: Probability Sampling:

➢ This is a technique in which sample from a larger population are chosen using a method based on the theory of probability.

➢ This sampling method considers every member of the population and forms samples on the basis of a fixed process.

➢ For example, in a population of 1000 members, each of these members will have 1/1000 chances of being selected to be a part of a sample.

➢ It gets rid of bias in the population and gives a fair chance to all members to be included in the sample.

➢ There are 4 types of probability sampling technique:

3.2.1. (I) Simple Random Sampling:

➢ One of the best probability sampling techniques that helps in saving time and resources, is the Simple Random Sampling method. It is a trustworthy method of obtaining information where every single member of a population is chosen randomly, merely by chance and each individual has the exact same probability of being chosen to be a part of a sample.

3.2.1. (II) Cluster Sampling:

➢ Cluster sampling is a method where the researchers divide the entire population into sections or clusters that represent a population.

➢ Clusters are identified and included in a sample on the basis of defining demographic parameters such as age, location, sex etc. which makes it extremely easy for a survey creator to derive effective inference from the feedback.

3.2.1.(III) Systematic Sampling:

➢ Using systematic sampling method, members of a sample are chosen at regular intervals of a population.

➢ It requires selection of a starting point for the sample and sample size that can be repeated at regular intervals. This type of sampling method has a predefined interval and hence this sampling technique is the least time-consuming.

➢ For example, a researcher intends to collect a systematic sample of 500 people in a population of 5000. Each element of the population will be numbered from 1-5000 and every 10th individual will be chosen to be a part of the sample (Total population/ Sample Size = 5000/500 = 10).

3.2.1(IV) Stratified Random Sampling:

➢ This is a method where the population can be divided into smaller groups, that don't overlap but represent the entire population together.

➢ While sampling, these groups can be organized and then draw a sample from each group separately.

➢ For example, a researcher looking to analyze the characteristics of people belonging to different annual income divisions, will

create strata (groups) according to annual family income such as – Less than Rs.10,000, Rs.11,000 – Rs.20,000, Rs.21,000 to Rs.30,000, Rs.31,000 to Rs.40,000 etc. and people belonging to different income groups can be observed to draw conclusions of which income strata have which characteristics.

3.2.2: Non Probability Sampling:

➢ This is a sampling method that involves a collection of feedback on the basis of a researcher or statistician's sample selection capabilities and not on a fixed selection process.

➢ In most situations, output of a survey conducted with a non-probable sample leads to skewed results, which may not totally represent the desired target population. But, there are situations such as the preliminary stages of research or where there are cost constraints for conducting research, where non-probability sampling will be much more effective than the other type.

➢ There are 4 types of non-probability sampling

3.2.2. (I) Convenience sampling:

➢ This method is dependent on the ease of access to subjects such as surveying customers at a mall or passers-by on a busy street. It is usually termed as convenience sampling, as it's carried out on the basis of how easy is it for a researcher to get in touch with the subjects.

➢ Researchers have nearly no authority over selecting elements of the sample and it's purely done on the basis of proximity and not representativeness.

➢ This non-probability sampling method is used when there are time and cost limitations in collecting feedback. In situations where there are resource limitations such as the initial stages of research, convenience sampling is used.

➢ For example, startups and NGOs usually conduct convenience sampling at a mall to distribute leaflets of upcoming events or promotion of a cause – they do that by standing at the entrance of the mall and giving out pamphlets randomly.

3.2.2. (II) Judgmental or Purposive Sampling:

➢ The sample is formed by the discretion of the judge purely considering the purpose of study along with the understanding of target audience. Also known as deliberate sampling, the participants are selected solely on the basis of research requirements and elements who do not suffice the purpose are kept out of the sample.

➢ For example, when researchers want to understand the thought process of people who are interested in studying for their master's degree. The selection criteria will be: "Are you interested in studying for Masters in Special Education?" and those who respond with a "No" will be excluded from the sample.

3.2.2. (III) Snowball sampling:

➢ This is a sampling method that is used in studies which need to be carried out to understand subjects which are difficult to trace.

➢ For example, it will be extremely challenging to survey shelter less people or illegal immigrants. In such cases, using the snowball theory, researchers can track a few of that particular category to interview and results will be derived on that basis.

➢ This sampling method is implemented in situations where the topic is highly sensitive and not openly discussed such as conducting surveys to gather information about HIV Aids. Not many victims will readily respond to the questions but researchers can contact people they might know or volunteers associated with the cause to get in touch with the victims and collect information.

3.2.2. (IV) Quota sampling:

➢ In Quota sampling, selection of members in this sampling technique happens on basis of a pre-set standard. In this case, as a sample is formed on basis of specific attributes, the created sample will have the same attributes that are found in the total population. It is an extremely quick method of collecting sampling.

3.3.1 Use of the Probability Sampling Method :

There are multiple uses of the probability sampling method. They are:

➢ **Reduce Sample Bias:** Using the probability sampling method, the bias in the sample derived from a population is negligible to non-existent. The selection of the sample largely depicts the understanding and the inference of the researcher. Probability sampling leads to higher quality data collection as the population is appropriately represented by the sample.

➢ **Diverse Population:** When the population is large and diverse, it is important to have adequate representation so that the data is not skewed towards one demographic. For example, if Square would like to understand the people that could their point-of-sale devices, a survey conducted from a sample of people across US from different industries and socio-economic backgrounds, helps.

➢ **Create an Accurate Sample:** Probability sampling helps the researchers plan and create an accurate sample. This helps to obtain well-defined data.

3.3.2 Use of the Non-Probability Sampling Method :
There are multiple uses of the non-probability sampling method. They are:

➢ **Create a hypothesis:** The non-probability sampling method is used to create a hypothesis when limited to no prior information is available. This method helps with immediate return of data and helps to build a base for any further research.

- ➢ **Exploratory research:** This sampling technique is widely used when researchers aim at conducting qualitative research, pilot studies or exploratory research.

- ➢ **Budget and time constraints:** The non-probability method when there are budget and time constraints and some preliminary data has to be collected. Since the survey design is not rigid, it is easier to pick respondents at random and have them take the survey or questionnaire.

3.4. Steps involved in Probability Sampling :

- ➢ **Choose your population of interest carefully:** Carefully think and choose from the population, people you think whose opinions should be collected and then include them in the sample.

- ➢ **Determine a suitable sample frame:** Your frame should include a sample from your population of interest and no one from outside in order to collect accurate data.

- ➢ **Select your sample and start your survey:** It can sometimes be challenging to find the right sample and determine a suitable sample frame. Even if all factors are in your favor, there still might be unforeseen issues like cost factor, quality of respondents and quickness to respond. Getting a sample to respond to true probability survey might be difficult but not impossible.

- ➢ But, in most cases, drawing a probability sample will save you time, money, and a lot of frustration. You probably can't send surveys to everyone but you can always give everyone a chance to participate, this is what probability sample is all about.

3.5 When to use Probability Sampling :

➢ **When the sampling bias has to be reduced:** This sampling method is used when the bias has to be minimum. The selection of the sample largely determines the quality of the research's inference. How researchers select their sample largely determines the quality of a researcher's findings. Probability sampling leads to higher quality findings because it provides an unbiased representation of the population.

➢ **When the population is usually diverse:** When your population size is large and diverse this sampling method is usually used extensively as probability sampling helps researchers create samples that fully represent the population. Say we want to find out how many people prefer medical tourism over getting treated in their own country, this sampling method will help pick samples from various socio-economic strata, background etc to represent the bigger population.

➢ **To create an accurate sample:** Probability sampling help researchers create an accurate sample of their population. Researchers can use proven statistical methods to draw accurate sample size to obtained well-defined data.

3.6 Advantages of Probability Sampling :

➢ **It's Cost-effective:** This process is both cost and time effective and a larger sample can also be chosen based on numbers assigned to the samples and then choosing random numbers from the bigger sample. Work here is done.

➢ **It's simple and easy:** Probability sampling is an easy way of sampling as it does not involve a complicated process. Its quick and saves time. The time saved can thus be used to analyze the data and draw conclusions.

➢ **It's non-technical:** This method of sampling doesn't require any technical knowledge because of the simplicity with which this can be done. This method doesn't require complex knowledge and its not at all lengthy.

3.7 When to use non-probability sampling:
➢ Use this type of sampling to indicate if a particular trait or characteristic exists in a population.
➢ Researchers widely use non-probability sampling when they aim at conducting qualitative research, pilot studies, or exploratory research.
➢ Researchers use it when they have limited time to conduct research or have budget constraints.
➢ When the researcher needs to observe whether a particular issue needs in-depth analysis, he applies this method.

3.8 Advantages of non-probability sampling :
➢ Non-probability sampling is a more conducive and practical method for researchers deploying surveys in the real world. Although statisticians prefer probability sampling because it yields data in the form of numbers. However, if done correctly, non-probability sampling can yield similar if not the same quality of results.

➢ Getting responses using non-probability sampling is faster and more cost-effective as compared to probability sampling because the sample is known to the researcher. The respondents respond quickly as compared to people randomly selected as they have a high motivation level to participate.

3.9 Difference between probability sampling and non-probability sampling:

Sr	Probability sampling	Non- Probability sampling
1	The sample is selected at random.	Sample selection based on the subjective judgment of the researcher.
2	Everyone in the population has an equal chance of getting selected.	Not everyone has an equal chance to participate.
3	Used when sampling bias has to be reduced.	The researcher does not consider sampling bias.
4	Useful when the population is diverse.	Useful when the population has similar traits.
5	Used to create an accurate sample.	The sample does not accurately represent the population.
6	Finding the right respondents is not easy.	Finding respondents is easy.
7	Probability Sampling is a sampling technique in which sample from a larger population are chosen using a method based on the theory of probability.	Non-probability sampling is a sampling technique in which the researcher selects samples based on the subjective judgment of the researcher rather than random selection.
8	The population is selected randomly.	The population is selected arbitrarily.
9	The research is conclusive in nature.	The research is exploratory in nature.
10	Since there is method to deciding the sample, the population demographics is conclusively represented.	Since the sampling method is arbitrary, the population demographics representation is almost always skewed.
11	Take a longer time to conduct since the research design defines the selection parameters before the market research study begins.	This type of sampling method is quick since neither the sample or selection criteria of the sample is undefined.
12	This type of sampling is entirely unbiased and hence the results are unbiased too and conclusive.	This type of sampling is entirely biased and hence the results are biased too rendering the research speculative.
13	In probability sampling, there is an underlying hypothesis before the study begins and the objective of this method is to prove the hypothesis.	In non-probability sampling, the hypothesis is derived after conducting the research study.

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UNIT: 4

PREPARING RESEARCH PROPOSAL AND REPORT

- ➢ STEPS OF RESEARCH
- ➢ QUALITIES OF GOOD RESEARCHER
- ➢ SOURCES OF RESEARCH PROBLEM
- ➢ EVALUATION OF RESEARCH
- ➢ POINTS TO BE KEPT IN MIND WHILE REVIEWING RESEARCH PAPER

PREPARING RESEARCH PROPOSAL AND REPORT

Steps of Research;

- Selection of research problem
- Formulation of hypothesis
- Preparation of research design
- Selection of sample
- Collection of data
- Analysis of data
- Generalization of steps

4.1 : Funnel type presentation of Research Report:

- ❑ Choosing a research area
- ❑ Stating research problem
- ❑ Research Performa
- ❑ Data collection
- ❑ Data analysis
- ❑ Research results
- ❑ Research report

4.2 : Steps in Research Proposal:

- ❑ Background of the problem
- ❑ Statement of the problem
- ❑ Review of related literature
- ❑ Research objectives
- ❑ Research Hypothesis
- ❑ Rational of Hypothesis
- ❑ Operational definitions
- ❑ Significance of the study
- ❑ Delimitations of the study
- ❑ Research Methods
- ❑ Population & Sample
- ❑ Tools of data collection
- ❑ Techniques of data analysis
- ❑ Proposed outline of the report
- ❑ Bibliography

4. 3: Steps of Research Problems:

No unique style, format is declared and no rigidity is found to determine the steps of educational research. However, there are some common character found almost on each research process and those could be considered as the steps of educational research. These are mentioned as under;

> **Step 1: Identifying the Gap in Knowledge :** The researcher, on the basis of experience and observation realizes that some

students in the class do not perform well in the examination. So he / she poses an unanswered question: Which factors are associated with students' academic performance?

➢ **Step 2: Identifying the Antecedent / Causes :** On the basis of experience, observation and a review of related literature, he / she realizes that students who are either very anxious or not at all anxious do not perform well in the examination. Thus he / she identifies anxiety as one of the factors that could be associated with student's academic performance.

➢ **Step 3 : Stating the Goals :** The researcher now states the goals of the study :
• To ascertain the relationship of anxiety with academic performance of students.
• To ascertain the gender differences in the anxiety and academic performance of students.
• To ascertain the gender difference in the relationship of anxiety with academic performance of students.

➢ **Step 4 : Formulating Hypotheses :** The researcher may state his / her hypotheses as follows:
• There is a significant relationship between anxiety and academic performance of students.
• There is a significant gender difference in the anxiety and academic performance of students.
• There is a significant gender difference in the relationship of anxiety with academic performance of students.

➢ **Step 5: Collecting Relevant Information :** The researcher uses appropriate tools and techniques to measure anxiety and academic performance of students, selects a sample of students and collects data from them.

➢ **Step 6: Testing the Hypotheses :** He / she now uses appropriate statistical techniques to verify and test the hypotheses of the study stated in Step 4.

➢ **Step 7: Interpreting the Findings:** He / she interpret the findings in terms of whether the relationship between anxiety and academic performance is positive or negative, linear or curvilinear. He / she finds that this relationship is curvilinear i.e. when a student's anxiety is either very low or very high, his / her academic performance is found to be low. But when a student's anxiety is moderate, his / her academic performance is found to be high. He / she now tries to explain this finding based on logic and creativity.

➢ **Step 8 : Comparing the Findings with Prior researchers' Findings:**
At this step, the researcher tries to find out whether his / her conclusions match those of the prior researches or not. If not, then the researcher attempts to find out why conclusions do not match with other researches by analyzing prior studies further.

➢ **Step 9 : Modifying Theory :**
On the basis of steps 7 and 8, the researcher speculates that anxiety alone cannot influence academic performance of students. There could be a third factor which influences the relationship between anxiety and academic performance of students. This third factor could be study habits of students. For instance, students who have very low level of anxiety may have neglected their studies throughout the year and hence their academic performance is poor. On the other hand, students who have very high level of anxiety may 7 not be able to remember what they have learnt or cannot concentrate on studies due to stress or may fall sick very often and hence cannot study properly. Hence their academic performance is poor. However, students with a moderate level of anxiety are motivated enough to study regularly and systematically all through the year and hence their academic performance is high. Thus, the loosely structured theory on student's academic performance needs to incorporate one more variable, namely, study habits of students. In other words, it needs to be modified.

> **Step 10: Asking New Questions:** Do study habits and anxiety interact with each other and influence academic performance of students? i.e. we can now start with a fresh topic of research involving three variables rather than two.

4.4: Qualities of a good Researcher:

- ❑ Attractive personality
- ❑ Good health
- ❑ Intellectual honesty
- ❑ Creative thinking
- ❑ Unbiasness
- ❑ Curiosity
- ❑ Alertness
- ❑ Reasoning power
- ❑ Discussion ability
- ❑ Broad vision
- ❑ Quick decision
- ❑ Passion for truth

4.5: Sources of Research problems:

- ❑ Personal experiences
- ❑ Historical documents
- ❑ Review of literature
- ❑ Academic discussions
- ❑ Situational needs
- ❑ Social & technological changes
- ❑ Policies & priorities
- ❑ Research Gaps
- ❑ Curiosity

4.6: Evaluation of Research problems:

❑ Researchable

❑ New

❑ Significant

❑ Interest

❑ Capabilities

❑ Resources

❑ Financial viable

❑ Time

❑ Useful

❑ Ethical issues

4.7: Points to be kept in mind while reviewing of Research Report/article

Reviewing of a research report/article is essential to find out major problems and shortcomings. Through a critical analysis, the student may gain some ideas into the nature of research problem, methodology for conducting research, the process by which data are analyzed and conclusions are drawn, format of writing research report, style of writing. The following questions are suggested to evaluate each components of research report.

Title and Abstract

➢ Are the tile and abstract clear and concise?

➢ Do they promise no more than the study can provide?

Problem

➢ Is the problem stated clearly?
➢ Is the problem researchable?

➢ Is background information on a problem presented?

➢ Is the significance of the problem given?

➢ Are the variables defined operationally?

Hypothesis

➢ Are hypotheses testable and stated clearly?

➢ Are hypotheses based on sound rationale?

➢ Are assumptions, limitations and delimitations stated?

Review of Repeated Literature

➢ Is it adequately covered?

➢ Are most of the sources primary?

➢ Are important findings noted?

➢ Is it well organized?

➢ Is the literature given directly relevant to the problem?

➢ Have the references been critical analyzed and the results of studies compared and constructed?

➢ Is the review well organized?

➢ Does it conclude with a brief summary and its implications for the problem investigated?

Sample

➢ Are the size and characteristics of the population studied described?

➢ Is the size of the sample appropriate?

➢ Is the method of selecting the sample clearly described?

Instruments and Tools

➢ Are data gathering instruments described clearly?

➢ Are the instruments appropriate for measuring the intended variable?

➢ Are validity and reliability the instruments discussed?

➢ Are systematic procedure followed if the instrument was developed by one researcher?

➢ Are administration, searing and interpretation procedures described?

Design and Procedure

➢ Is the design appropriate for testing the hypotheses?

➢ Are the procedures described in detail?

➢ Are control procedures described?

Results

➢ Is the statistical method appropriate?

➢ Is the level of significance given?

➢ Are tables and figures given?

➢ Is every hypothesis tested?

➢ Are the data in each table and figure described clearly?

➢ Are the results stated clearly?

Discussions

➢ Is each finding discussed?

➢ Is each finding discussed in term of its agreement and disagreement with previous studies?

➢ Are generalizations consistent with the results?

Conclusions and Recommendations

➢ Are theoretical and practical implications of the findings discussed?

➢ Are recommendations for further action made?

➢ Are recommendations for further research made?

Summary

➢ Is the problem restated?

➢ Are the number and type of subjects and instruments described?

➢ Are procedures described?

➢ Are the major findings and conclusions described?

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