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**TYPES OF RESEARCH**

**Introduction**

**Meaning of research**

Research is a process to discover new knowledge to find answers to a question. The word research has two parts re (again) and search (find) which denote that we are taking up an activity to look into an aspect once again or we want to look for some new information about something.

Research comprises defining and redefining problems, formulating a hypothesis; collecting, organizing and evaluating data; and reaching conclusions.

**Types of research**

Research can be classified into various categories depending on the perspective under which the research activity is initiated and conducted. The categorization depends on the following perspectives in general:

 • Application of research study

 • Objectives in undertaking the research

• Inquiry mode employed for research

**1. Classification based on Application:**

1. ***APPLIED RESEARCH***

Applied research refers to scientific study and research that seeks to solve practical problems. Applied research is used to find solutions to everyday problems, cure illness, and develop innovative technologies, rather than to acquire knowledge for knowledge's sake. For example, applied researchers may investigate ways to:

• Improve agricultural crop production

• Treat or cure a specific disease

 • Improve the energy efficiency of homes, offices, or modes of transportation

1. ***BASIC RESEARCH***

Basic (aka fundamental or pure) research is driven by a scientist's curiosity or interest in a scientific question. The main motivation is to expand man's knowledge, not to create or invent something. There is no obvious commercial value to the discoveries that result from basic research. For example, basic science investigations probe for answers to questions such as:

• How did the universe begin?

 • What are protons, neutrons, and electrons composed of?

Other examples of basic research include investigations into the genetic basis of certain traits or diseases in biology, or exploration of the fundamental principles of human cognition in psychology. The outcomes of basic research contribute to the foundation of knowledge in various disciplines.

**2. Classification based on Objectives:**

**a. *CORRELATIONAL RESEARCH***

This is a type of non-experimental research method, in which a researcher measures two variables, understands and assesses the statistical relationship between them with no influence from any extraneous variable. This is undertaken to discover or establish the existence of a relationship/ interdependence between two or more aspects of a situation. For example, the mind can memorize the bell of an ice cream seller or sugar candy vendor. Louder the bell sound, closer is the vendor to us. We draw this inference based on our memory and the taste of these delicious food items. This is specifically what co relational research is, establishing a relationship between two variables, ―bell sound‖ and ―distance of the vendor‖ in this particular example. Correlational research is looking for variables that seem to interact with each other so that when you see one variable changing, you have a fair idea how the other variable will change.

**Advantages:**

1) Can collect much information from many subjects at one me.

2) Can study a wide range of variables and their interrelations.

3) Study variables that are not easily produced in the laboratory.

**Disadvantages**:

1. Correlation does not indicate causation( cause and effect).

***b.DESCRIPTIVE RESEARCH***

Descriptive research seeks to systematically explain a situation, problem, phenomenon, service, or program by providing detailed information. It involves a systematic approach to answering questions about who, what, when, where, and how related to a specific research question or problem.

This type of research makes an attempt to collect any information that can be expressed in quantifiable terms that can be used to statistically analyse a target audience or a particular subject. Descriptive research is used to observe and describe a research subject or problem without influencing or manipulating the variables in any way.

***Advantages:***

* Descriptive research is straightforward and easy to conduct, providing a clear and concise overview of a particular subject or phenomenon.
* It is less expensive and time consuming than quantitative experiments.
* Collects a large amount of notes for detailed studying.
* This method is flexible and adaptable, allowing researchers to study a wide range of topics.

***Disadvantages***

• Does not identify the cause-and-effect relationships between variables.

• Response rate is low in this research.

• The interpretation of data in descriptive research can be subjective, as researchers rely on their observations and judgments to describe the studied phenomenon.

• Results of this research can change over the period of time.

1. **Exploratory Research:**

Exploration has been the human kind‘s passion since the time immemorial. Looking out for new things, new destinations, new food, and new cultures has been the basis of most tourist and travel journeys. In the subjective terms exploratory research is conducted to find a solution for a problem that has not been studied more clearly, intended to establish priorities, develop operational definitions and improve the final research design. Exploratory research helps determine the best research design, data-collection method and selection of subjects. For such a research, a researcher starts with a general idea and uses this research as a medium to identify issues that can be the hub for future research. An important aspect here is that the researcher should be willing to change his/her direction subject to the revelation of new data or insight. Such a research is usually carried out when the problem is at a beginning stage. It is often referred to as grounded theory approach or interpretive research as it used to answer questions like what, why and how. For example: a fast food outlet owner feels that increasing the variety of snacks will enable increase in sales, however he is not sure and needs more information. Thus the owner starts studying local competition, talks to the existing customers, friends etc to find out what are their views about the current menu and what else do they wish to be included in the menu and also assess whether he would be able to generate higher revenues.

1. **EXPERIMENTAL RESEARCH**

Experimental research is a scientific research method that involves manipulating one or more independent variables to observe and measure their effects on one or more dependent variables, while controlling for other variables. The goal of experimental research is to establish cause-and-effect relationships between variables. In an experiment, researchers design controlled conditions to test a hypothesis and draw conclusions about the impact of the manipulated variables on the outcomes of interest. This method is widely used in various scientific disciplines, including psychology, physics, biology, and medicine, to gain a deeper understanding of the underlying principles governing phenomena. Experimental research typically involves random assignment of participants to different conditions to minimize bias and increase the validity of the findings.

The simplest experimental design includes two variables and two groups of participants.

***The two variables (Independent versus Dependent variables*).**

• The IV is the predictor variable whereas the DV is the outcome variable.

• Researchers manipulate and control the IV to study its effect on the DV.

***The two groups of participants (Control versus Experimental group).***

 • Before beginning the experiment, the researcher (randomly) assigns his/her sample to two different groups: the control group and the experimental (treatment group).

• The control group receives no manipulation of the IV (no treatment), whereas the experimental group receives the manipulation of the IV.

**3 Classification based on inquiry mode employed for research**

On a broader perspective, all researches can be classified into two groups:

• **Qualitative Research**

**• Quantitative Research**

**Qualitative research** is research dealing with phenomena that are difficult or impossible to quantify mathematically, such as beliefs, meanings, attributes, and symbols

Qualitative researchers aim to gather an in-depth understanding of human behaviour and the reasons that govern such behaviour. The qualitative method investigates the why and how of decision making, not just what, where, when.

**Advantages**

• It enables more complex aspects of a person’s experience to be studied.

• Good for exploratory research and hypothesis generation.

• The participants are able to provide data in their own words and in their own way.

**Disadvantages**

• It is more difficult to determine the validity and reliability of linguistic data.

• Time consuming.

**QUANTITATIVE RESEARCH**

Quantitative research is a research method that relies on the systematic collection and analysis of numerical data to draw conclusions and make inferences about a population or phenomenon under study. The primary aim of quantitative research is to quantify relationships, patterns, and trends, allowing for statistical analysis and generalization of findings to a larger population.

**Key characteristics of quantitative research include:**

**Objective and Measurable Data:** Quantitative research focuses on collecting data that can be expressed in numerical terms. This data is often gathered through structured surveys, experiments, or observations.

**Statistical Analysis:** Numerical data is subjected to statistical analysis to identify patterns and relationships. This helps researchers draw objective conclusions from the data.

**Large Sample Sizes:** Quantitative research often involves larger sample sizes to enhance the generalizability of findings to a broader population.

**Structured Research Design:** The research design in quantitative studies is typically highly structured, with clearly defined variables and methods. This structure enhances the replicability of the study.

**Hypothesis Testing:** Quantitative research often involves testing hypotheses and using statistical methods to determine whether the findings are statistically significant.

**Objectivity and Replicability:** Researchers strive for objectivity in data collection and analysis, and the goal is often to produce findings that can be replicated by other researchers.