ISHIK UNIVERSITY
FACULTY OF ENGINEERING
ARCHITECTURAL ENGINEERING DEPARTMENT

VARIOUS TYPES OF RESEARCHES

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

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?
- How do slime molds reproduce?
- What is the specific genetic code of the fruit fly?

APPLIED RESEARCH

BASIC RESEARCH

CORRELATIONAL RESEARCH

DESCRIPTIVE RESEARCH

ETHNOGRAPHIC RESEARCH

EXPERIMENTAL RESEARCH

EXPLORATORY RESEARCH .

GROUNDED THEORY RESEARCH.

HISTORICAL RESEARCH

PHENOMENOLOGICAL

RESEARCH

QUALITATIVE RESEARCH

QUANTITATIVE RESEARCH

CORRELATIONAL RESEARCH

Correlational research *refers to the systematic investigation or statistical study of relationships among two or more variables, without necessarily determining cause and effect.*

It Seeks to establish a relation/association/correlation between two or more variables that do not readily lend themselves to experimental manipulation.

For example, to test the hypothesis " Listening to music lowers blood pressure levels" there are 2 ways of conducting research

- Experimental – group samples and make one group listen to music and then compare the bp levels
- Survey – ask people how they feel ? How often they listen? And then compare

CORRELATIONAL RESEARCH

Advantages:

1) Can collect much information from many subjects at one time.
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).
2) Problems with self-report method .

DESCRIPTIVE RESEARCH

Descriptive research *refers to research that provides an accurate portrayal of characteristics of a particular individual, situation, or group. Descriptive research, also known as* ***statistical research.***

These studies are a means of discovering new meaning, describing what exists, determining the frequency with which something occurs, and categorizing information.

In short descriptive research deals with everything that can be counted and studied, which has an impact of the lives of the people it deals with.

For example,

- finding the most frequent disease that affects the children of a town. The reader of the research will know what to do to prevent that disease thus, more people will live a healthy life.

DESCRIPTIVE RESEARCH

Advantages:

- The people individual studied are unaware so they act naturally or as they usually do in everyday situation;
- It is less expensive and time consuming than quantitative experiments;
- Collects a large amount of notes for detailed studying;
- As it is used to describe and not make any conclusions it is to start the research with it;

Disadvantages

- Descriptive research requires more skills.
- Does not identify cause behind a phenomenon
- Response rate is low in this research.
- Results of this research can change over the period of time.

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ETHNOGRAPHIC RESEARCH

Ethnographic research *refer to the investigation of a culture through an in-depth study of the members of the culture; it involves the systematic collection, description, and analysis of data for development of theories of cultural behaviour.*

- It studies people, ethnic groups and other ethnic formations, their ethno genesis, composition, resettlement, social welfare characteristics, as well as their material and spiritual culture.
- Data collection is often done through participant observation, interviews, questionnaires, etc.
- The purpose of ethnographic research is to attempt to understand what is happening naturally in the setting and to interpret the data gathered to see what implications could be formed from the data.

EXPERIMENTAL RESEARCH

Experimental research *is an objective, systematic, controlled investigation for the purpose of predicting and controlling phenomena and examining probability and causality among selected variables.*

Advantages

- Best establishes cause-and-effect relationships

Disadvantages

- Artificiality
- Feasibility
- Unethical

EXPERIMENTAL RESEARCH

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 it's 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 or clinical group).
- The control group receives no manipulation of the IV (no treatment), whereas the experimental group receives the manipulation of the IV

EXPLORATORY RESEARCH

Exploratory research *is a type of research conducted for a problem that has not been clearly defined. Exploratory research helps determine the best research design, data collection method and selection of subjects.*

- The results of exploratory research are not usually useful for decision-making by themselves, but they can provide significant insight into a given situation
- Exploratory research is not typically generalizable to the population at large.
- Exploratory research can be quite informal, **relying on secondary research** such as reviewing available literature and/or data, or qualitative approaches such as informal discussions with consumers, employees, management or competitors, and more formal approaches through in-depth interviews, focus groups, projective methods, case studies or pilot studies.

GROUNDED THEORY RESEARCH

Grounded theory research *is a research approach designed to discover what problems exist in a given social environment and how the persons involved handle them; it involves formulation, testing, and reformulation of propositions until a theory is developed.*

Grounded theory is a research method that operates almost in a **reverse fashion** from traditional research and at first may appear to be in contradiction to the scientific method.

Four stages:

1. **Codes-**Identifying anchors that allow the key points of the data to be gathered
2. **Concepts**-Collections of codes of similar content that allows the data to be grouped
3. **Categories-**Broad groups of similar concepts that are used to generate a *theory*
4. **Theory-**A collection of explanations that explain the subject of the research (hypotheses)

HISTORICAL RESEARCH

Historical research *is research involving analysis of events that occurred in the remote or recent past*

Application

- Historical research can show patterns that occurred in the past and over time which can help us to see where we came from and what kinds of solutions we have used in the past.
- Understanding this can add perspective on how we examine current events and educational practices.

The steps involved in the conduct of historical research

Here are the five steps:

1. Identification of the research topic and formulation of the research problem or question.
2. Data collection or literature review
3. Evaluation of materials
4. Data synthesis
5. Report preparation or preparation of the narrative exposition

HISTORICAL RESEARCH

Historical research gives a social scientist a better context for making realistic decisions.

Strengths

- Provides a comprehensive picture of historical trends
- Uses existing information
- Provides evidence of on-going trends and problems

Limitations

- Time-consuming
- Resources may be hard to locate
- Resources may be conflicting
- May not identify cause of a problem
- Information may be incomplete, obsolete, inconclusive, or inaccurate
- Data restricted to what already exists

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PHENOMENLOGICAL RESEARCH

Phenomenological research *an inductive, descriptive research approach developed from phenomenological philosophy; its aim is to describe an experience as it is actually lived by the person*

- Phenomenology is concerned with the study of experience from the perspective of the individual, 'bracketing' taken-for-granted assumptions and usual ways of perceiving.
- They are based in a paradigm of personal knowledge and subjectivity, and emphasise the importance of personal perspective and interpretation.
- As such they are powerful for understanding subjective experience, gaining insights into people's motivations and actions, and cutting through the clutter of taken-for-granted assumptions and conventional wisdom.

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

- ***Qualitative Research***
- ***Quantitative Research***

QUALITATIVE 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.

QUALITATIVE RESEARCH

Advantages

- It enables more complex aspects of a persons experience to be studied
- Fewer restriction or assumptions are placed on the data to be collected.
- Not everything can be quantified, or quantified easily, Individuals can be studied in more depth
- 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
- there is more subjectivity involved in analysing the data.
- "Data overload" – open-ended questions can sometimes create *lots* of data, which can take along time to analyse!
- Time consuming

QUANTITATIVE RESEARCH

Quantitative research *refers to the systematic empirical investigation of any phenomena via statistical, mathematical or computational techniques. The objective of quantitative research is to develop and employ mathematical models, theories and/or hypotheses pertaining to phenomena*

Quantitative research is generally made using scientific methods, which can include:

- The generation of models, theories and hypotheses
- The development of instruments and methods for measurement
- Experimental control and manipulation of variables
- Collection of empirical data
- Modelling and analysis of data
- Evaluation of results

QUANTITATIVE RESEARCH

Advantages

- Quantitative research allows the researcher to measure and analyse data.
- The researcher is more objective about the findings of the research.
- Quantitative research can be used to test hypotheses in experiments because of its ability to measure data using statistics.

Disadvantages

- The main disadvantage of quantitative research is the context of the study or experiment is ignored.
- Quantitative research does not study things in a natural setting or discuss the meaning things have for different people.
- A large sample of the population must be studied for more accurate results