

Types of Research



Exploratory, Empirical, etc.

How
done

Purpose

Categories of Research:

Source of
data

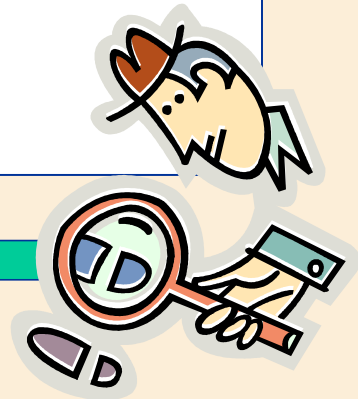
Basic and
applied

Primary and
Secondary

Lesson 1. Types of research based on purpose

- *Research could be undertaken to solve:*
 - ✓ *theoretical problems - basic research.*
 - ✓ *practical problems - applied research.*

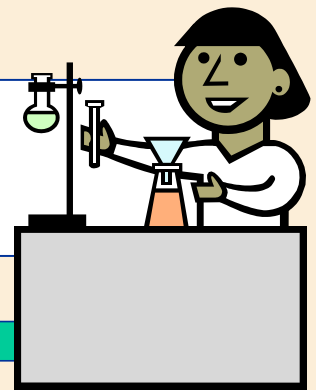
Basic Research



- Also known as pure or fundamental research
- Objective
 - ✓ Advancement of knowledge(formulating or expanding theory)
 - ✓ Understanding of theoretical relationship between variables
 - ✓ Exploratory in nature (discovery of knowledge)
 - ✓ Without any practical end in mind

E.g. At what point in human history did logical thought arise?

Applied Research



- Solve specific, practical questions
- Involves precise measurement of the characteristics and describes relationships between variables of a studied phenomenon
 - ✓ *Applied research employs methodology that is not as rigorous as that of basic research.*
 - ✓ *It yields findings that can be evaluated in terms of local applicability and not in terms of universal validity.*
- Investigation directed “to discovering new scientific knowledge that has specific commercial objectives with respect to **products, processes** or **services**.”

E.g

- ✓ Search for alternative energy sources for Ethiopia.
- ✓ How can Akaki river be protected against contamination by industrial effluents?
- ✓ What is the most efficient and effective vaccine against influenza?
- ✓ How can communication among workers in large companies be improved?

Basis for Comparison	Basic Research	Applied Research
Meaning	Basic Research refers to the study that is aimed at expanding the existing base of scientific knowledge	Applied Research is the research that is designed to solve specific practical problems or answer certain questions.
Nature	Theoretical	Practical
Utility	Universal	Limited
Concerned with	Developing scientific knowledge and predictions	Development of technology and technique
Goal	To add some knowledge to the existing one.	To find out solution for the problem at hand.

Lesson 1 - Cont'd ...

Note:

Most new research questions originate from theories

- **theories normally are a set of related statements that explain a set of facts**
- **researchers of all disciplines use theories to help them describe facts.**
- **Theories are strengthened by test results**

E.g. 1. Discovery of electromechanical induction by Michael Faraday leads to the invention of electric devices such as radios and generators

2. The discovery of radio active isotopes are now vital for medical

"It's important to realize that support for basic science is the seed that allows the medical applications and technology to grow."

Prof. Ramakrishnan (2009 Nobel prize winner for chemistry)

Lesson 1 - Cont'd ...



Therefore,

- *basic and applied research are not mutually exclusive.*
 - *There are researches that have both theoretical and practical implications.*
 - *The distinction is a matter of emphasis rather than a true dichotomy.*
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Lesson 2. Types of research based on how it is done

- **Exploratory research** - identifies new problems.
- **Constructive research** - develops solutions to a problem
- **Empirical research** - test a solution by empirical evidence
- **Primary and secondary research** - problem analysis using either primary or secondary sources

Lesson 2 - Cont'd ...

Exploratory research is most commonly unstructured, “informal” research that is undertaken to gain background information about the general nature of the research problem.

Exploratory research is usually conducted when the researcher does not know much about the problem and needs additional information or desires new or more recent information.

Exploratory research is used in a number of situations:

To gain background information

To define terms

To clarify problems and hypotheses

To establish research priorities



Lesson 2 - Cont'd ...

Therefore, exploratory research:

- ✓ *provides significant insight into a given situation but not usually useful for decision making by itself.*
- ✓ *often relies on secondary research such as reviewing available literature.*
- ✓ *helps to determine the best research design, data collection method and selection of subjects.*

E.g Why our sales are declining?



Lesson 2 - Cont'd ...



A variety of methods are available to conduct exploratory research:

- ✓ **Secondary Data Analysis**
 - ✓ **Experience Surveys**
 - ✓ **Case Analysis**
 - ✓ **Focus Groups**
- 

Lesson 2 - Cont'd ...

EMPIRICAL RESEARCH

- ✓ It is based on observation and experience more than upon theory and abstraction.
- ✓ It can be qualitative & quantitative.
- **Empirical research** - *research that bases its findings on direct or indirect observation as its test of reality.*
 - ✓ *Statistical formulas are fundamental to forming logical, valid conclusions.*
 - ✓ **Empirical research is based on observed and measured phenomena and derives knowledge from actual experience rather than from theory or belief.**
 - ✓ **Applies observation and experience as the main modes of gathering data.**

Empirical & theoretical/conceptual research complements each other in developing an understanding of the phenomena, in predicting future events.

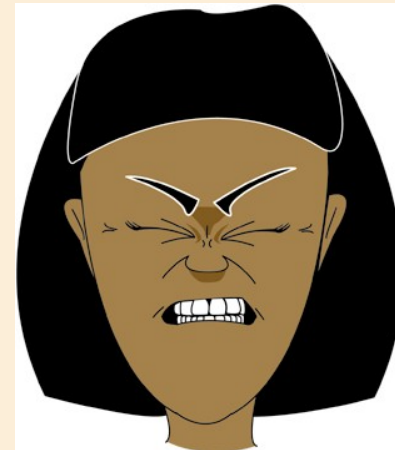


Lesson 2 - Cont'd ...

Experimental Research

- Explores cause and effect relationships.

E.g. Eating too many bananas causes constipation.



Qualitative and quantitative research



- Quantitative methods are identified with the so-called “hard science” disciplines, whereas qualitative methods, with the social sciences
 - **Quantitative research:** Quantitative researchers favor methods such as surveys and experiments, and will attempt to test hypotheses or statements with a view to infer from the particular to the general. This approach typically concentrates collecting and **analyzing numerical data** and **applying statistical tests**
 - Collects numeric data from participants, analyzes these numbers using statistics, and conducts the inquiry in an unbiased, objective manner.
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Lesson 2 - Cont'd ...

- **Qualitative research:** involves studies that do not attempt to quantify their results through statistical summary or analysis
- In qualitative research data are often in the form of descriptions, not numbers
- Involves in-depth interviews, group discussions, projective techniques, and observations without formal measurement.

Lesson 2 - Cont'd ...

- **Primary and secondary research**

- ✓ **Primary/field research - the collection of data that does not already exist.**

Primary Data: data collected from participants through methods such as telephone, mail, online, and face-to-face (quantitative), and observation studies and focus groups (qualitative)

- ✓ **Secondary/desk research - the summary, collection and/or synthesis of existing research**

Secondary Data: accessing data through sources such as the internet and library

Group Discussion

- *Group yourself into three*
 - *Group 1 -*
 - *Group 2 -*
 - *Group 3 -*

Research topics

1. The design and analysis of computer algorithms
2. Data Mining to support customer Relationship Management at

Ethiopian Airlines

3. **The Economic Impacts of Unacceptable Web Site Download Speeds**

- *Identify and Label each topic as purely basic, applied or a combination of the two.*
 - *Give reasons why a topic is labeled as basic, applied or both?*
- Discuss*
- *Present the gist of discussions.*