REVA UNIVERSITY
Bengaluru, India

Research Methodology – Unit 1

Course Code: M23DE0205 – Academic year 2024-2025, II Semester MCA (Even Semester)

School of Computer Science and Applications

Dr M Vinayaka Murthy
Professor

LECTURE -1 INTRODUCTION, RESEARCH AND TYPES OF RESEARCH: MEANING & OBJECTIVES OF RESEARCH

Agenda

- Importance of the Course
- Prerequisites for this Course
- Course Objectives
- Course Content
- Course Outcomes
- Text & Reference Books
- Assessment for Course
- Introduction
- Research
- Meaning of Research
- Objectives of Research

IMPORTANCE OF THE COURSE

1. Research methodology is crucial for ensuring the validity, reliability, and ethical integrity of research.
2. It provides a structured approach for conducting research, helping researchers to plan, organize, and execute their studies systematically.
3. By following a defined methodology, researchers can minimize biases, ensure accurate data collection and
4. Draw the meaningful Conclusions

PREREQUISITES FOR THIS COURSE

1. A clear and focused research question, understanding the research problem, developing a research methodology, and
2. Considering potential collaborators. Additionally, it's crucial to choose the right research topic and ask the right questions.
3. Ethical considerations and the availability of necessary resources also play a vital role

COURSE OBJECTIVES

The objectives of this course are to:

1. To orient students towards Research work.
2. To equip students to carry out individual or team Research work according to Scientific / Technology requirements.

COURSE CONTENT

UNIT 1: Research and Types of research: Meaning of Research- Objectives of Research- Motivation in Research. Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical. Research Process. Criteria of good Research.

UNIT 2: Research Formulation : Defining and formulating the research problem. Selecting the problem - Necessity of defining the problem – Importance of literature review in defining a problem – Literature review – Primary and secondary sources – reviews, treatise, monographs- patents – web as a source – searching the web - Critical literature review – Identifying gap areas from literature review - Development of working hypothesis..

COURSE CONTENT CONTD.

UNIT 3: Data Collection and Analysis: Execution of the research – Observation and Collection of data - Methods of data collection – Modeling, Mathematical Models for research, Sampling Methods- Data Processing and Analysis strategies. Data Analysis with Statistical Packages – Hypothesis-testing, Generalization-and-Interpretation.

UNIT 4: Application of results and Ethics: Environmental impacts - Ethical issues - ethical committees - Commercialization – Copy right – royalty - Reproduction of published material – Plagiarism - Citation and acknowledgement - Reproducibility and accountability.

COURSE OUTCOMES

On successful completion of this course; student shall be able to:

1. Identify and describe researchable ideas, projects, and themes.
2. Design and specify methods for carrying out scientific research and demonstrate possession of skills and attitudes to conduct such research.
3. Be able to analyze data using scientific methodologies
4. Present research results in a systematic and objective way.

TEXT AND REFERENCE BOOKS

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.

References:

1. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International.
2. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Ess Publications.

ASSESSMENT FOR COURSE

The Scheme of Assessment and Evaluation will have TWO PARTS, namely;

i) Internal Assessment (IA); and

ii) Semester End Examination (SEE)

Assessment and Evaluation of each Course shall be for 50 marks. The Internal Assessment (IA) and Semester End Examination (SEE) of PG programs shall carry 25 marks each (i.e., 25 marks internal assessment; 25 marks semester end examination).

The 25 marks of Internal Assessment (IA) shall comprise of:

Internal Test	= 15 marks
Assignments	= 05 marks
Seminars	= 05 marks

ASSESSMENT FOR COURSE CONTD.

There shall be two internal tests conducted as per the schedule given below. The students have to attend all the two tests compulsorily.

1st test for 15 marks during 2nd part of the 8th week of the beginning of the semester; and

2nd test for 15 marks during 2nd part of the 16th week of the beginning of the semester.

The coverage of syllabus for the said two tests shall be as under:

For the 1st test the syllabus shall be First and Second Unit of the Course;

For the 2nd test it shall be Third and Fourth Unit of the Course.

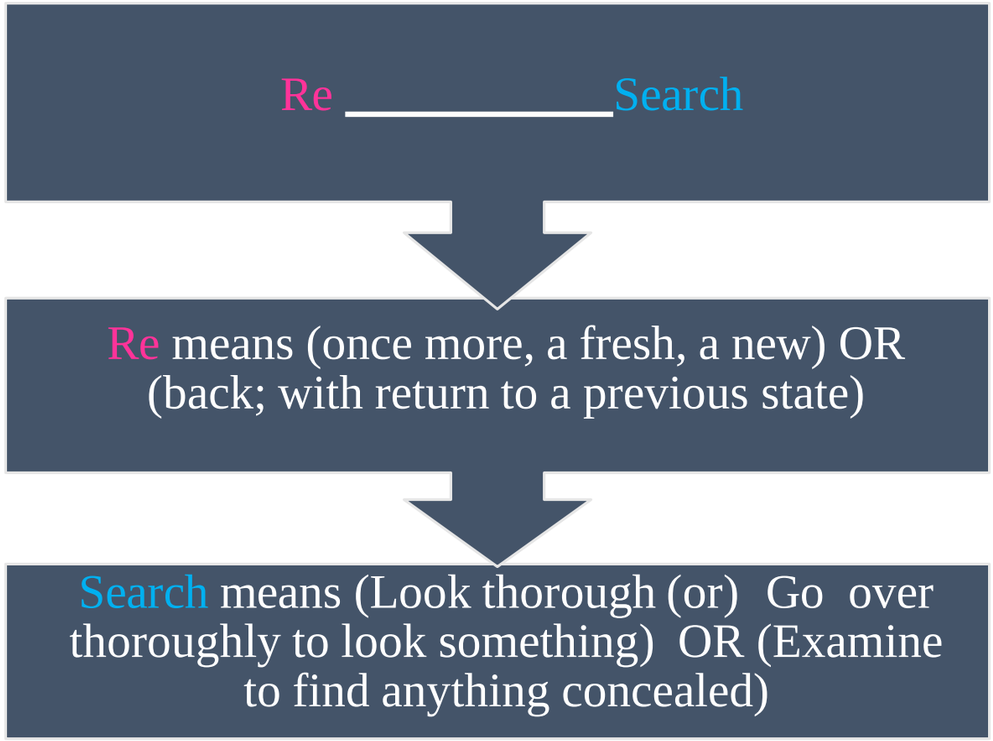
The average marks of the two test secured is considered while assessing the performance of the students.

ASSESSMENT FOR COURSE CONTD.

1. There shall be two (or more) Assignments and two (or more) Seminars each carrying equal marks. Hence all the assignments carry total 05 marks and all the seminars carries 05 marks. In place of assignments and seminars, there shall be model designs or some task based activity wherein the number of designs/ activity the marks each design / activity carries shall be decided by the School Board.
2. The duration of the Internal Test shall be 75 minutes and for Semester End Examination the duration shall be 3 hours.
3. The Semester End Examination for 100 marks (scale down by 25 marks) shall be held during 19th and 20th week of the beginning of the semester and the syllabus for the semester end examination shall be entire 4 units.

INTRODUCTION

RESEARCH



INTRODUCTION – CONTD.

Research is an

Organized

Systematic

Way of

Finding Answers to Questions

SYSTEMATIC because there is a definite set of procedures and steps to follow.

There are certain things in the research process that are always done in order to get the most accurate results.

INTRODUCTION – CONTD.

ORGANIZED

- In that there is a **structure or method** in going about doing research.
- It is a **planned procedure**, not a spontaneous one.
- It is focused and limited to a **specific scope.**

SYSTEMATIC

- Because there is definite, Set of Procedures and steps which you will follow.
- There are certain things in the Research process which are always done in order to get the most accurate results.

INTRODUCTION – CONTD.

FINDING ANSWERS

- Is the end of all research.
- Whether it is the answer to a hypothesis or even a simple question, Research is successful when we find answers.
- Sometimes the answer is no, but it is still an answer

INTRODUCTION – CONTD.

QUESTIONS

- Are **central** to research.
- If there is **no question**, then the answer is of no use.
- Research is focused on **relevant, useful, and important** questions.
- Without a question, research has **no focus, drive, or purpose.**

What is research?

"Research is the systematic approach to obtaining and confirming new and reliable knowledge"

This is a general definition which applies to all disciplines

MEANING OF RESEARCH

Research is a search for knowledge.

Research as a scientific and systematic search for pertinent information on a specific topic.

Research is an art of scientific investigation.

Research as a careful investigation or inquiry specially through search for new facts in any branch of knowledge.

Research as a "systematized effort to gain new knowledge."

MEANING OF RESEARCH CONTD.

Some people consider research as a movement,

A movement from the known to the unknown.

It is actually a voyage of discovery

Obtaining the knowledge of whatever the unknown, can be termed as Research

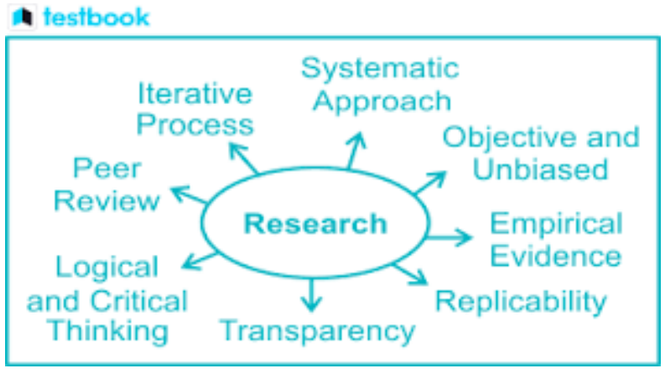
Clifford Woody comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis.

MEANING OF RESEARCH CONTD.

Research is, thus, an original contribution to the existing stock of knowledge making for its advancement.

It is the persuit of truth with the help of study, observation, comparison and experiment.

In short, the search for knowledge through objective and systematic method of finding solution to a problem is Research.



OBJECTIVES OF RESEARCH

The purpose of research is to discover answers to questions through the application of scientific procedures.

The main aim of research is to find out the truth which is hidden and which has not been discovered as yet.

Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it.

(studies with this object in view are termed as exploratory or formulative research studies);

OBJECTIVES OF RESEARCH CONTD.

2. To portray accurately the characteristics of a particular individual, situation or a group

(studies with this object in view are known as descriptive research studies);

3. To determine the frequency with which something occurs or with which it is associated with something else

(studies with this object in view are known as diagnostic research studies);

4. To test a hypothesis of a causal relationship between variables

(such studies are known as hypothesis-testing research studies).

SUMMARY

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- Introduction
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- Meaning of Research
- Objectives of Research

PROBLEMS FOR PRACTICE

Research and Types of research: Meaning of Research- Objectives of Research- Motivation in Research. Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical. Research Process. Criteria of good Research

LECTURE -2, MOTIVATION IN RESEARCH, RESEARCH METHODS VS METHODOLOGY

- Introduction
- Research
- Meaning of Research
- Objectives of Research

OBJECTIVE

- Motivation in Research
- Research Methods
- Research Methodology
- Research Methods Vs Research Methodology

MOTIVATION IN RESEARCH

What makes people to undertake research?

This is a question of fundamental importance. The possible motives for doing research may be either one or more of the following:

1. Desire to get a research degree along with its consequential benefits;
2. Desire to face the challenge in solving the unsolved problems,

i.e., concern over practical problems initiates research;

3. Desire to get intellectual joy of doing some creative work;
4. Desire to be of service to society;
5. Desire to get respectability.

MOTIVATION IN RESEARCH CONTD.

However, this is not an exhaustive list of factors motivating people to undertake research studies.

Many more factors such as
Directives of government,
Employment conditions,
Curiosity about new things,
Desire to understand causal relationships,
Social thinking and awakening,
and the like may as well motivate (or at times compel) people to perform research operations.

RESEARCH METHODS

Research methods are systematic approaches used to collect, analyze, and interpret data in scientific investigations.

Research methods are the tools and techniques researchers use to gather and analyze data.

The choice of research method depends on the nature of the research question, the type of data needed, and the resources available.

Note: Research Methods, is only known that, what type data, methods and etc., used by the investigator.

Others don't know why / what purpose its are used.

RESEARCH METHODS CONTD.

Three Groups:

1. First group consists of the methods concerned with the collection of data

2. Second group consists of those statistical techniques which are used for establishing relationships between the data and the unknowns

3. Third group consists of those methods which are used to evaluate the accuracy of the results obtained

RESEARCH METHODOLOGY

Research Methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically.

Explains the flow by which a research problem is systematically solved

Also consider the logic behind the methods.

RESEARCH METHODOLOGY

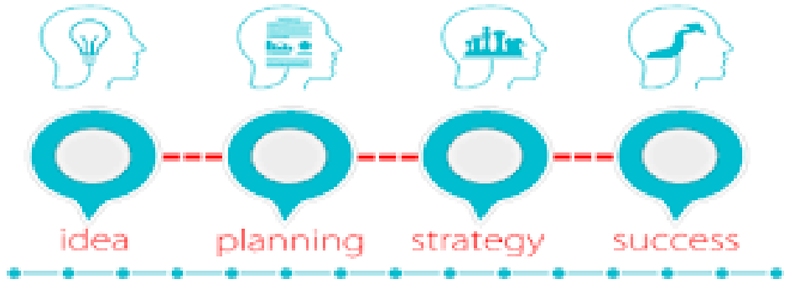
The context of research study and explain why using a particular method or technique and why not using others.

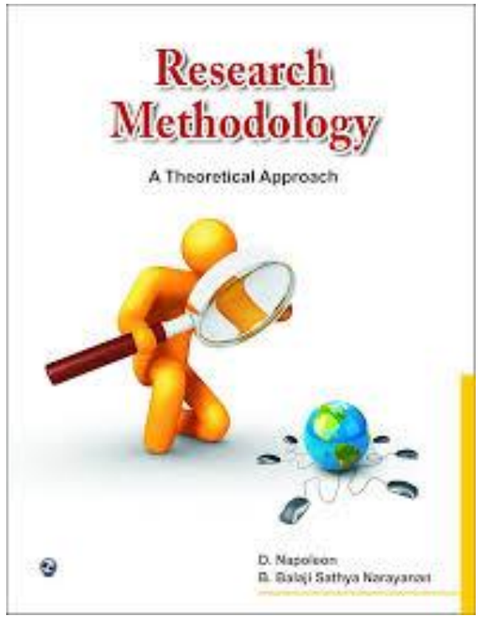
So that research results are capable of being evaluated either by the researcher himself / herself or by others.

RESEARCH METHODOLOGY CONTD.

Research Methodology

It discusses various steps that are generally adopted by a researcher while investigating a problem along with the logic behind them.





RESEARCH METHOD VS METHODOLOGY

1.Research method focuses on the techniques and tools used to gather data, while research methodology deals with the overall strategy and framework of research.
2.Research method involves specific procedures and steps to obtain information, whereas research methodology guides the researcher in selecting appropriate research methods.
3.Research method determines the type of data to be collected and analyzed, while research methodology provides a systematic approach to conducting research.
4. Research method describes the process of data collection and analysis, whereas research methodology relates to the theoretical and philosophical underpinnings of research.

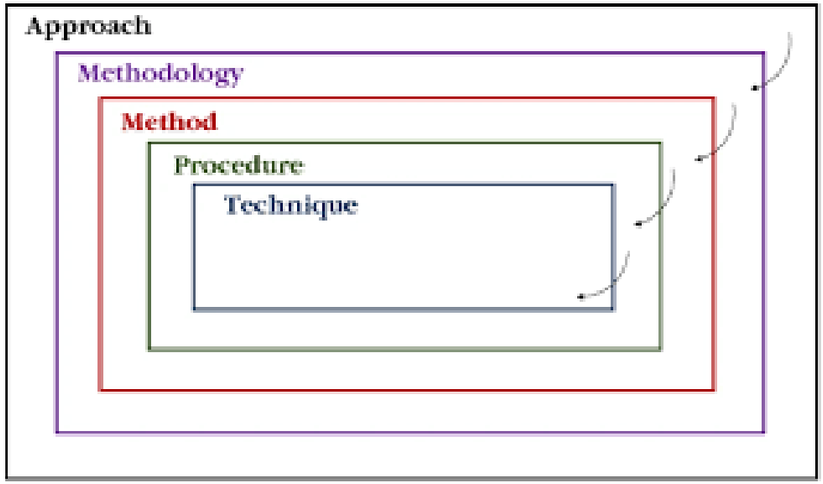
RESEARCH METHOD VS METHODOLOGY

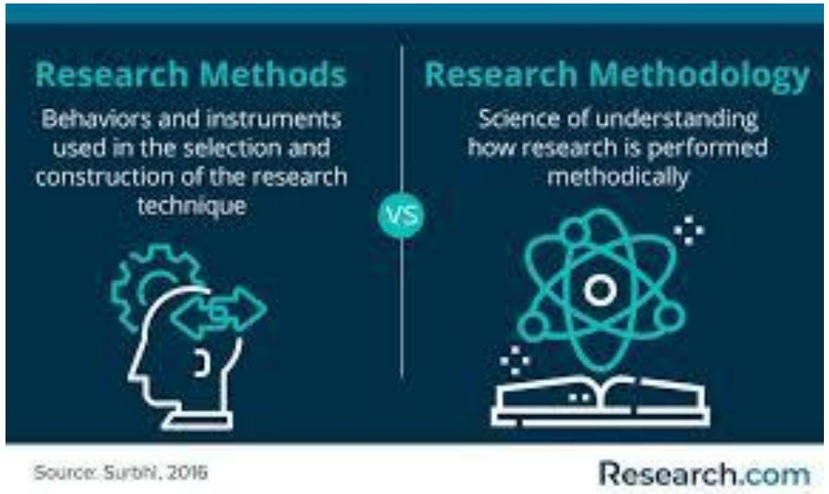
5. Research method is more concrete and tangible, focusing on the practical aspects of research, while research methodology is more abstract and conceptual, focusing on the theoretical aspects.
6. Research method is a subset of research methodology, which encompasses the entire research process.
7. Research method is specific to a particular research project or study, while research methodology is applicable across different research projects and studies.
8. Research method determines the reliability and validity of research findings, whereas research methodology determines the overall validity and soundness of research.
9. Research method is concerned with the tools and techniques employed, while research methodology focuses on the framework and approach utilized in the research process.

RESEARCH METHOD VS METHODOLOGY

Difference b/w Research Method & Research Methodology

Research Method	Research Methodology
Method used by researcher to conduct research	Way to systematically solve the research problem
Carrying out experiment, test, surveying etc.	Study of different instruments that can be used in conducting experiment, test etc.
Aims at finding solution to research problem	Aims at employment of correct procedure to find out the solution
Comprises of Different investigation techniques	Comprises of Entire strategy towards achievement of objectives.





SUMMARY

- Motivation in Research
- Research Methods
- Research Methodology
- Research Methods Vs Research Methodology

PROBLEM FOR PRACTICE

Research and Types of research: Meaning of Research- Objectives of Research- Motivation in Research. Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical. Research Process. Criteria of good Research

LECTURE -3, TYPES OF RESEARCH, DESCRIPTIVE VS. ANALYTICAL

- Motivation in Research
- Research Methods
- Research Methodology
- Research Methods Vs Research Methodology

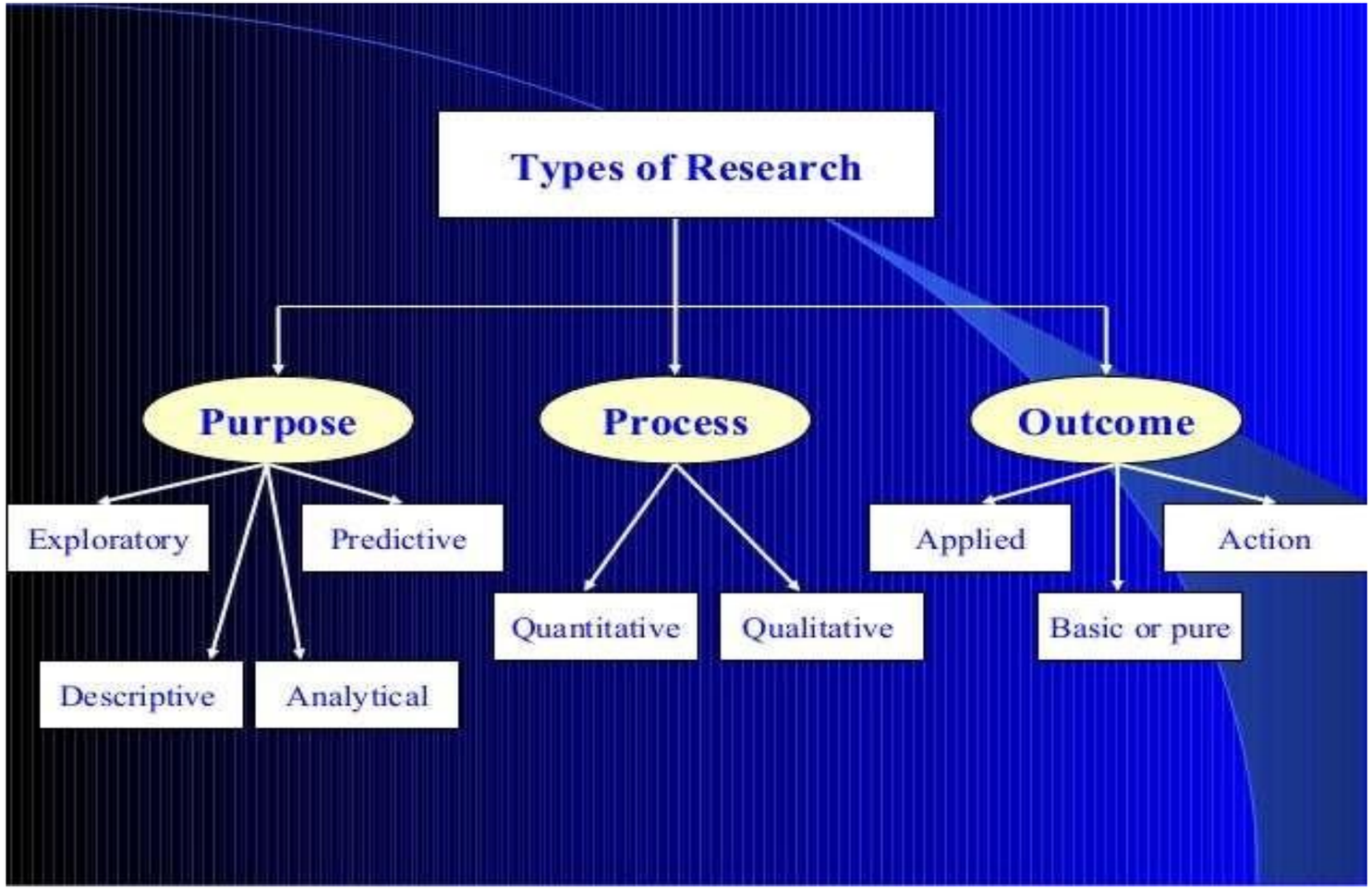
OBJECTIVE

- Types of Research
- Descriptive Research
- Subdivision of Descriptive Research
- Analytical Research
- Descriptive Vs Analytical

TYPES OF RESEARCH CONTD.

MAJOR TYPES OF RESEARCH

TYPES OF RESEARCH CONTD.



DESCRIPTIVE

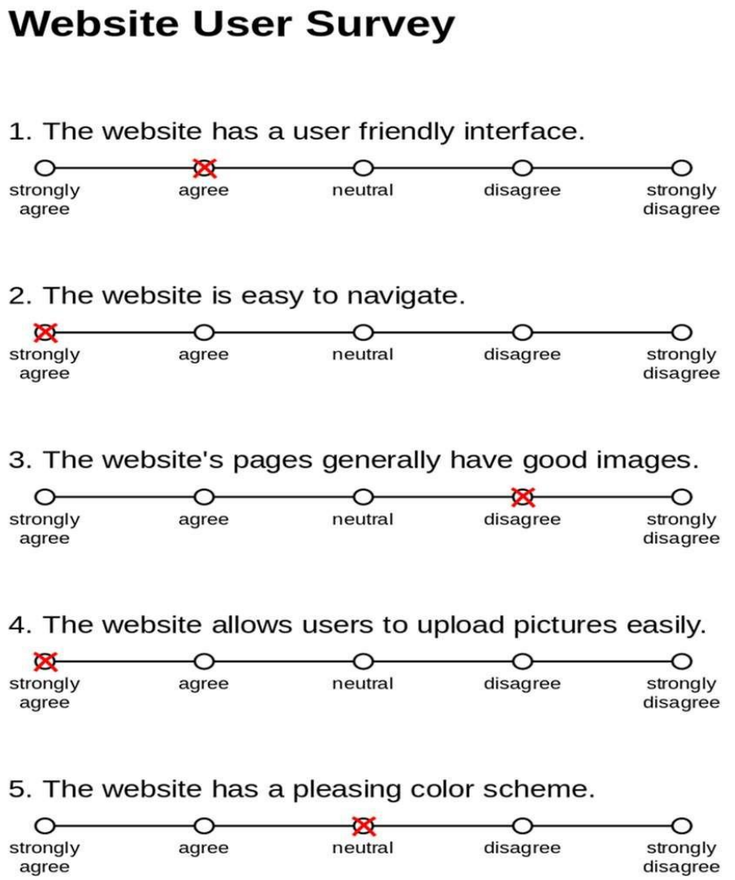
- Theory-based design method, created by gathering, analyzing, and presenting collected data.

- Surveys and fact-finding enquiries of different kinds
- Purpose is the description of the state of affairs as it exists in present
- Researcher has no control over the variables;
- He or She can only report what has happened or what is happening.
- Descriptive design helps others better understand the need for the research.
- Researcher interested in describing the situation or case under their research study

SUBDIVISIONS OF DESCRIPTIVE RESEARCH

1) Survey Research

Participants answer questions administered through interviews or questionnaires.



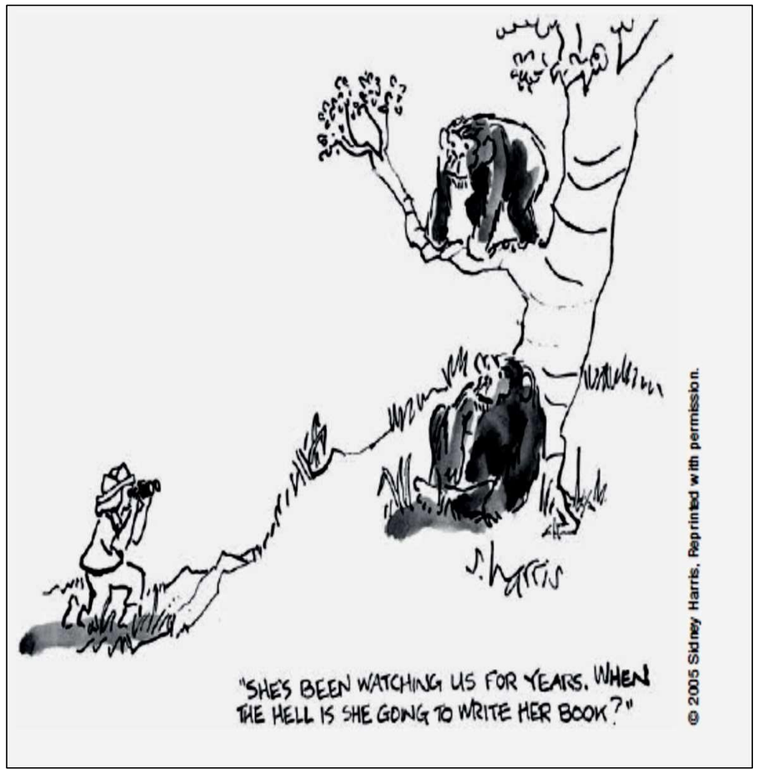
SUBDIVISIONS OF DESCRIPTIVE RESEARCH CONTD.

2) Observational methods

When we begin research in an area, it may be appropriate to start with an observational study before doing anything more complicated.

Two types of observational studies

- Field (Naturalistic) observation
- Laboratory, or systematic observation



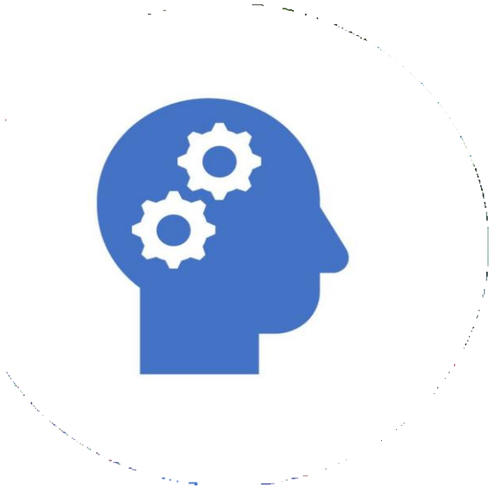
SUBDIVISIONS OF DESCRIPTIVE RESEARCH CONTD.

3) The Case-Study

One of the oldest research methods

A case study is **an in-depth, detailed examination of a particular case** (or cases) within a real-world context.

Example: Split-brain patients and hemispheric specialization was conducted using case studies



SUBDIVISIONS OF DESCRIPTIVE RESEARCH CONTD.

Correlational Study

A correlational research design investigates relationships between two variables (or more) without the researcher controlling or manipulating any of them

SUBDIVISIONS OF DESCRIPTIVE RESEARCH CONTD.

Comparative Study

It involves examining and contrasting different cases, groups, or objects to identify similarities, differences, and patterns.

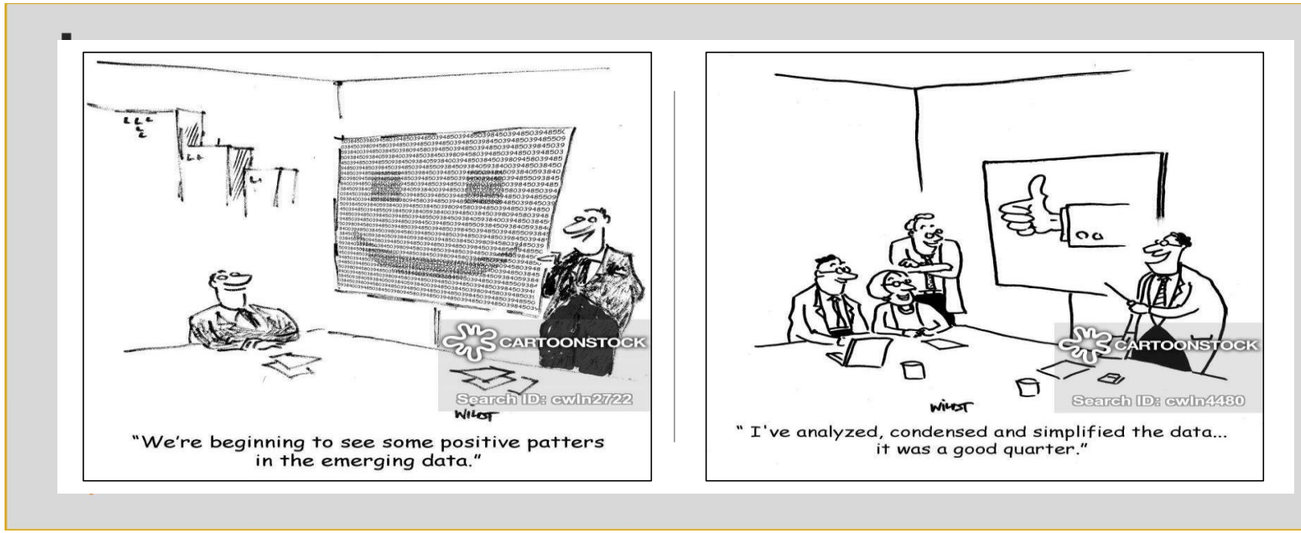
Comparative analysis is a research methodology that involves comparing two or more data sets to draw meaningful conclusions.

ANALYTICAL RESEARCH

Analytical Research is an information already available and analyze these to make a critical evaluation of the material.

(or)

Analytical research involves a systematic investigation that uses critical thinking to evaluate existing facts and information.



SUBDIVISIONS OF ANALYTICAL RESEARCH

Historical Research

Philosophical Research

Review

Research synthesis (Meta analysis

i.e. Analysis of the review already published

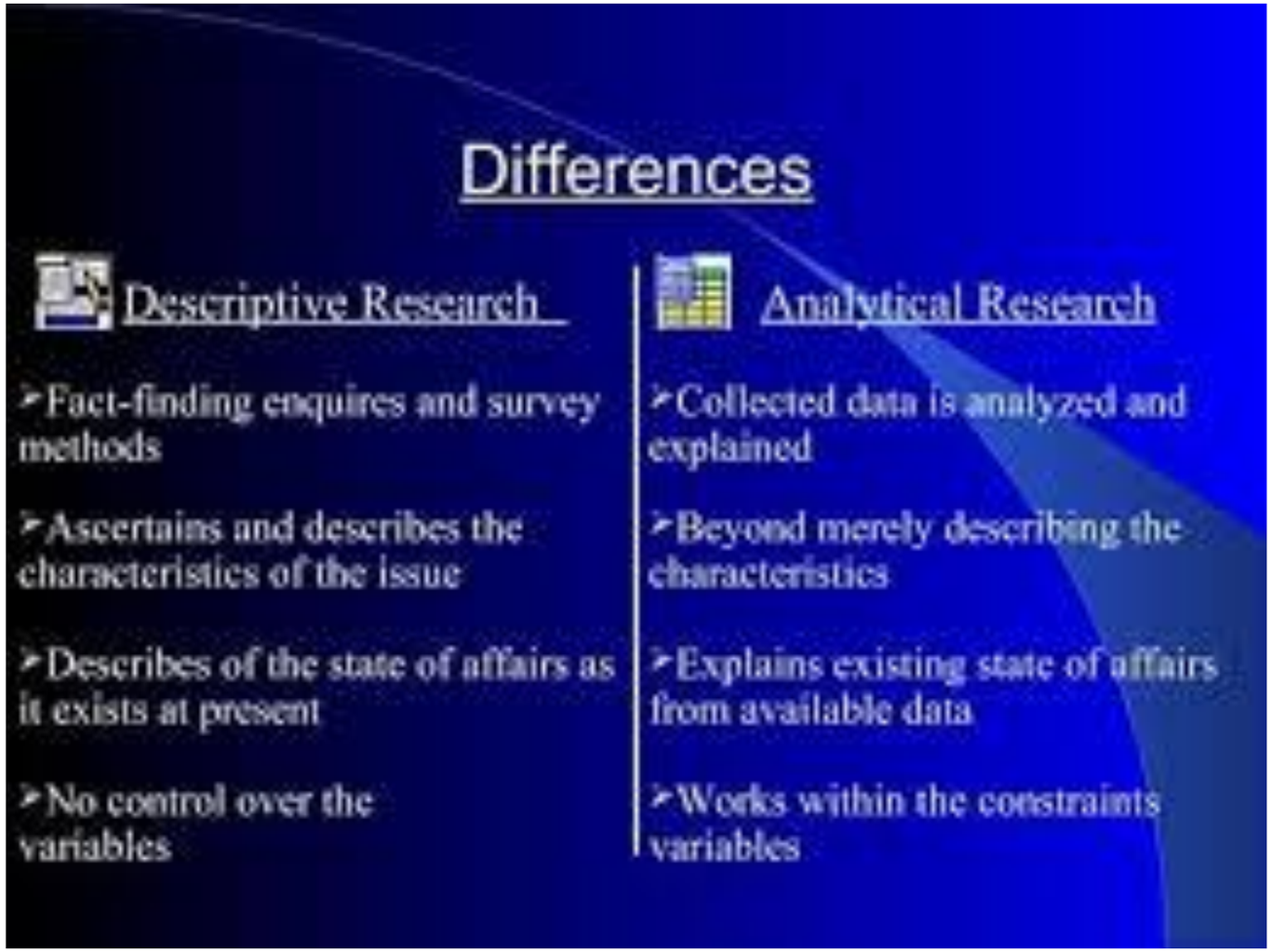
DESCRIPTIVE VS ANALYTICAL

- Descriptive vs Analytical Research

  Descriptive Research is a fact finding investigation which is aimed at describing the characteristics of individual, situation or a group (or) describing the state of affairs as it exists at present.

  Analytical Research is primarily concerned with testing hypothesis and specifying and interpreting relationships, by analyzing the facts or information already available.

DESCRIPTIVE VS ANALYTICAL



DESCRIPTIVE VS ANALYTICAL

DESCRIPTIVE	ANALYTICAL
•Descriptive research includes surveys and fact-finding enquiries of different kinds. •The major purpose of descriptive research is description of the state of affairs as it exists at present. •The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. •Example 1: Examining the fluctuations of U. S. international trade balance during 1974-1995. •2.Starting from late 1986, the value of U.S. dollar value has steadily increased against the Japanese yen and German Mark. Examining the magnitude of this trend in the value of U.S. dollar is another example of descriptive research;	•In analytical research, on the other hand, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material. •Analytical research attempts to explain why and how. It usually concerns itself with cause–effect relationships among variables. •Example1:Explaining why and how U.S. trade balance move in a particular way over time. •2. While explaining *how* and *why* this surge in the value of U.S. dollar is going to affect the U.S. Is analytical research.

SUMMARY

- Types of Research
- Descriptive Research
- Subdivision of Descriptive Research
- Analytical Research
- Descriptive Vs Analytical

PROBLEMS FOR PRACTICE

Research and Types of research: Meaning of Research- Objectives of Research- Motivation in Research. Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical. Research Process. Criteria of good Research

LECTURE -4, APPLIED VS. FUNDAMENTAL, QUANTITATIVE VS. QUALITATIVE.

- Types of Research
- Descriptive Research
- Subdivision of Descriptive Research
- Analytical Research
- Descriptive Vs Analytical

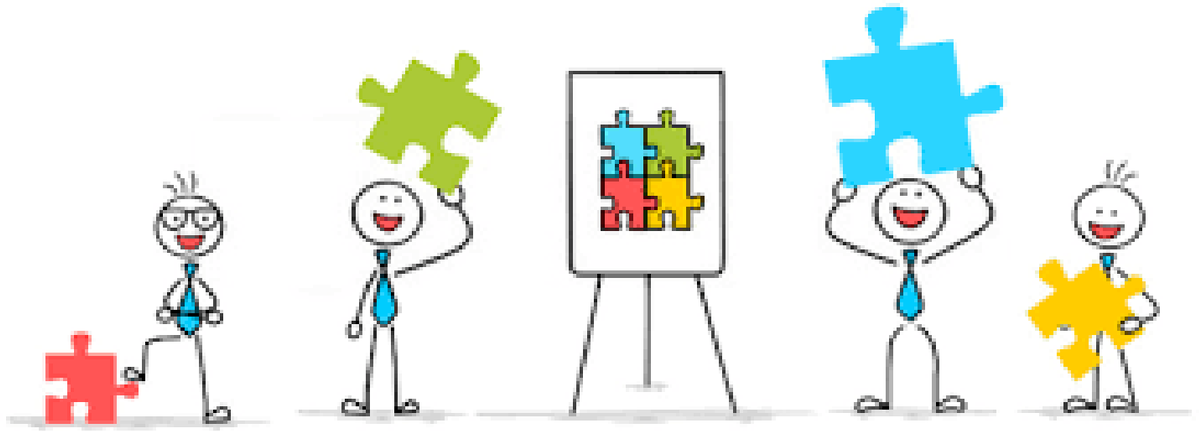
OBJECTIVE

- Applied Research
- Fundamental Research
- Applied Vs Fundamental
- Quantitative Research
- Qualitative Research
- Quantitative Vs Qualitative

APPLIED (ACTION) RESEARCH

'Applied (Action) Research' aims at finding a solution for an immediate problem facing a society or an Industry, or a business organization.

Applied Research aimed at certain conclusions or solutions arrived at for problems faced by a society or a business.

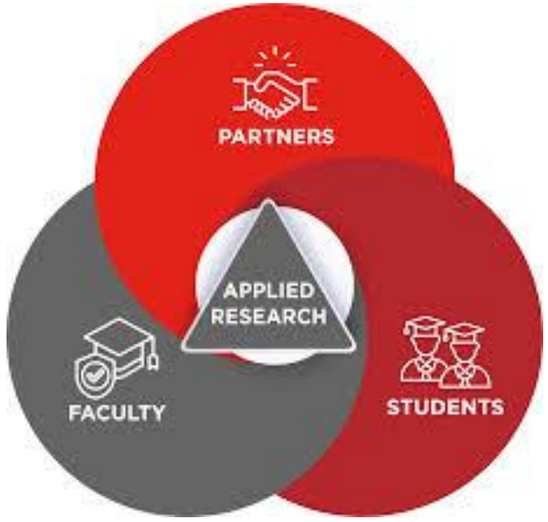


APPLIED (ACTION) RESEARCH

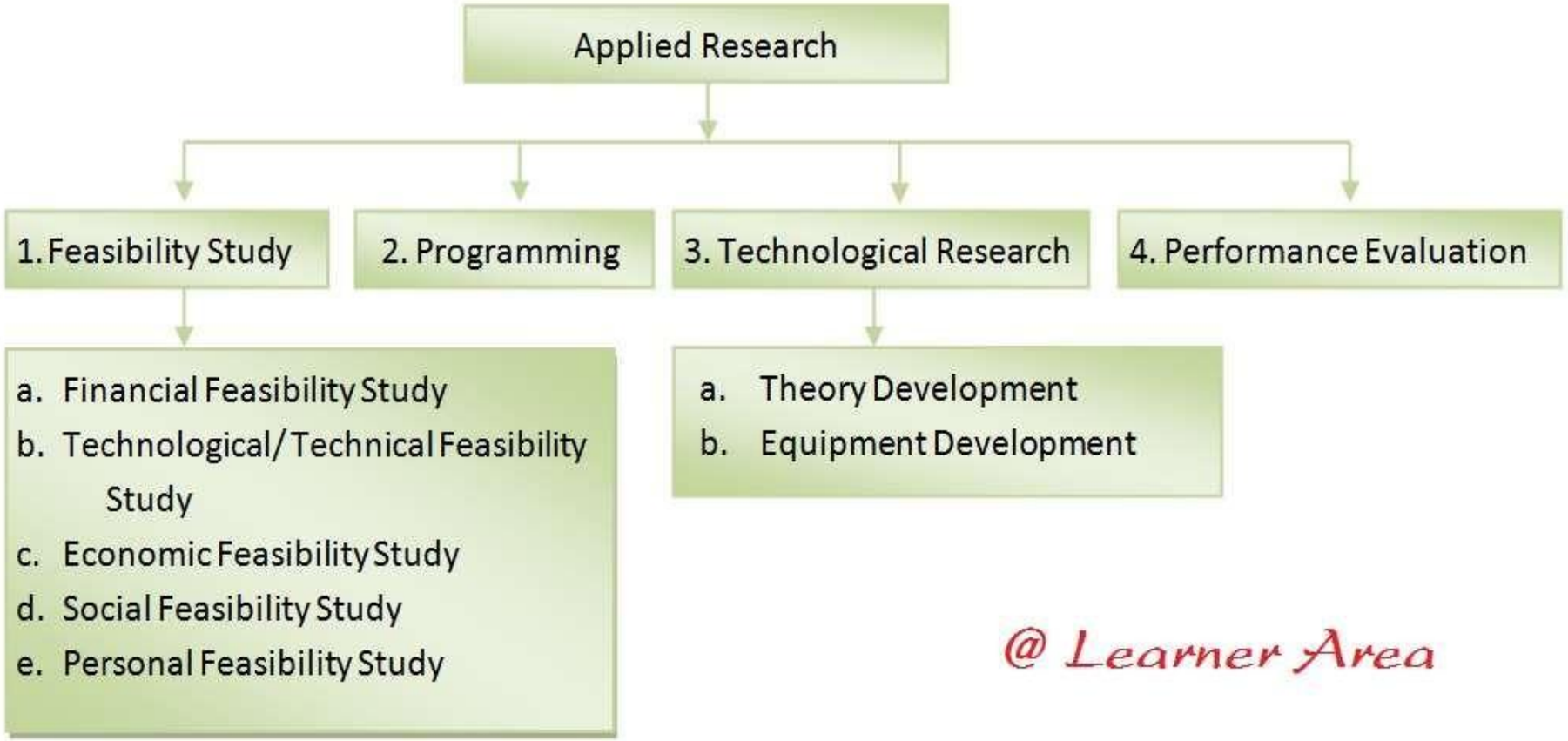
Research to find out whether certain communications will be read and understood.

The central aim of applied research is to discover a solution for some pressing practical problem.

Examples: Social / Business problems, Marketing Research and Evaluation Research



APPLIED RESEARCH CONTD.

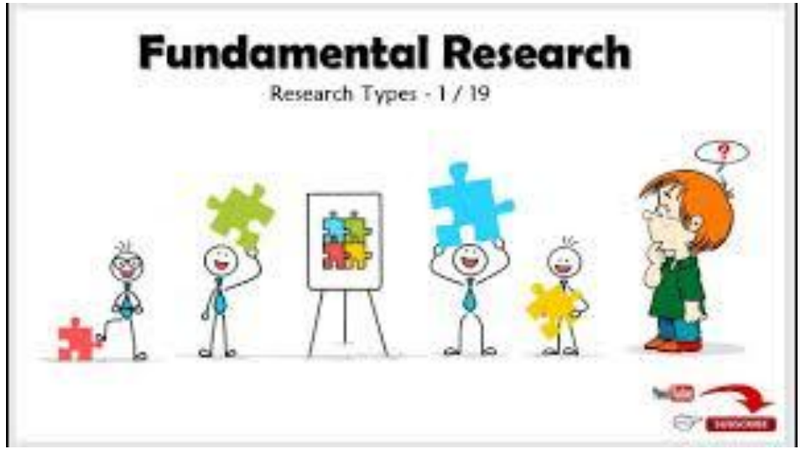


FUNDAMENTAL (PURE / BASIC) RESEARCH

Fundamental research is mainly concerned with the formulation of a theory.

Gathering knowledge for knowledge's sake is termed pure or basic or fundamental research.

Examples are: Research concerning some relating to pure mathematics, research studies concerning about human behavior carried out with a view to make generalizations about human behavior

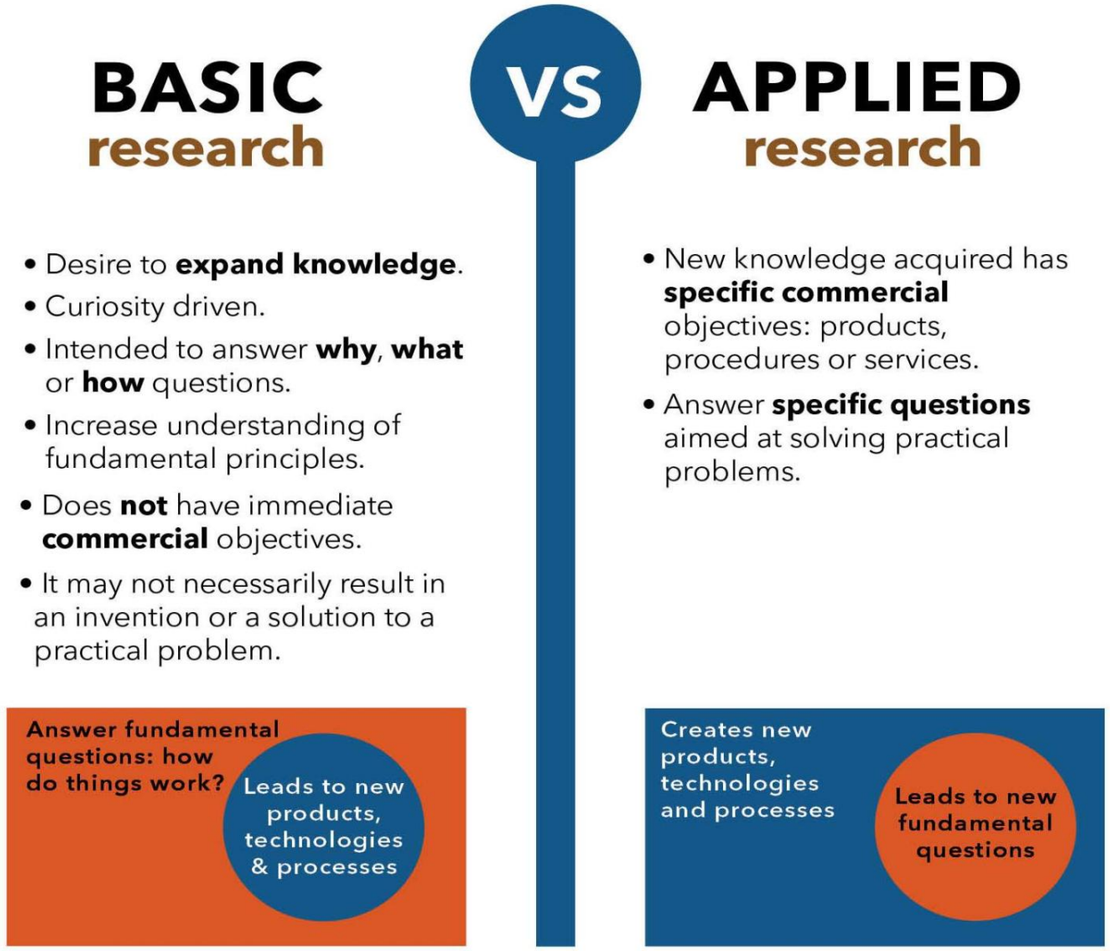


APPLIED VS FUNDAMENTAL

Applied Research or Action Research is carried out to find solution to a real life problem requiring an action or policy decision.

Fundamental Research which is also known as basic or pure research is undertaken for the sake of knowledge without any intention to apply it in practice.
It is undertaken out of intellectual curiosity and is not necessarily problem-oriented.

APPLIED VS FUNDAMENTAL CONTD.



QUANTITATIVE RESEARCH

Quantitative Research is a Research strategy that focuses on collecting and analyzing numerical data to understand phenomena, relationships, and patterns.
It relies on mathematical or statistical methods to draw objective conclusions

QUANTITATIVE RESEARCH IS BASED ON THE MEASUREMENT OF QUANTITY OR AMOUNT

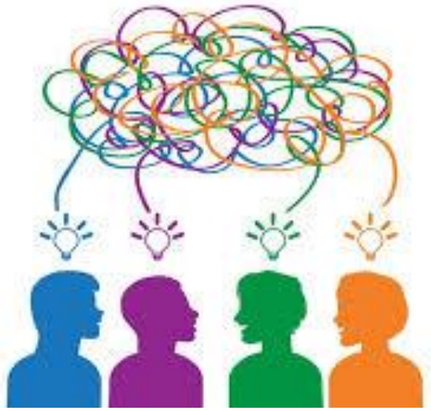
It is applicable to phenomena that can be expressed in terms of quantity.

Quantitative UX Research

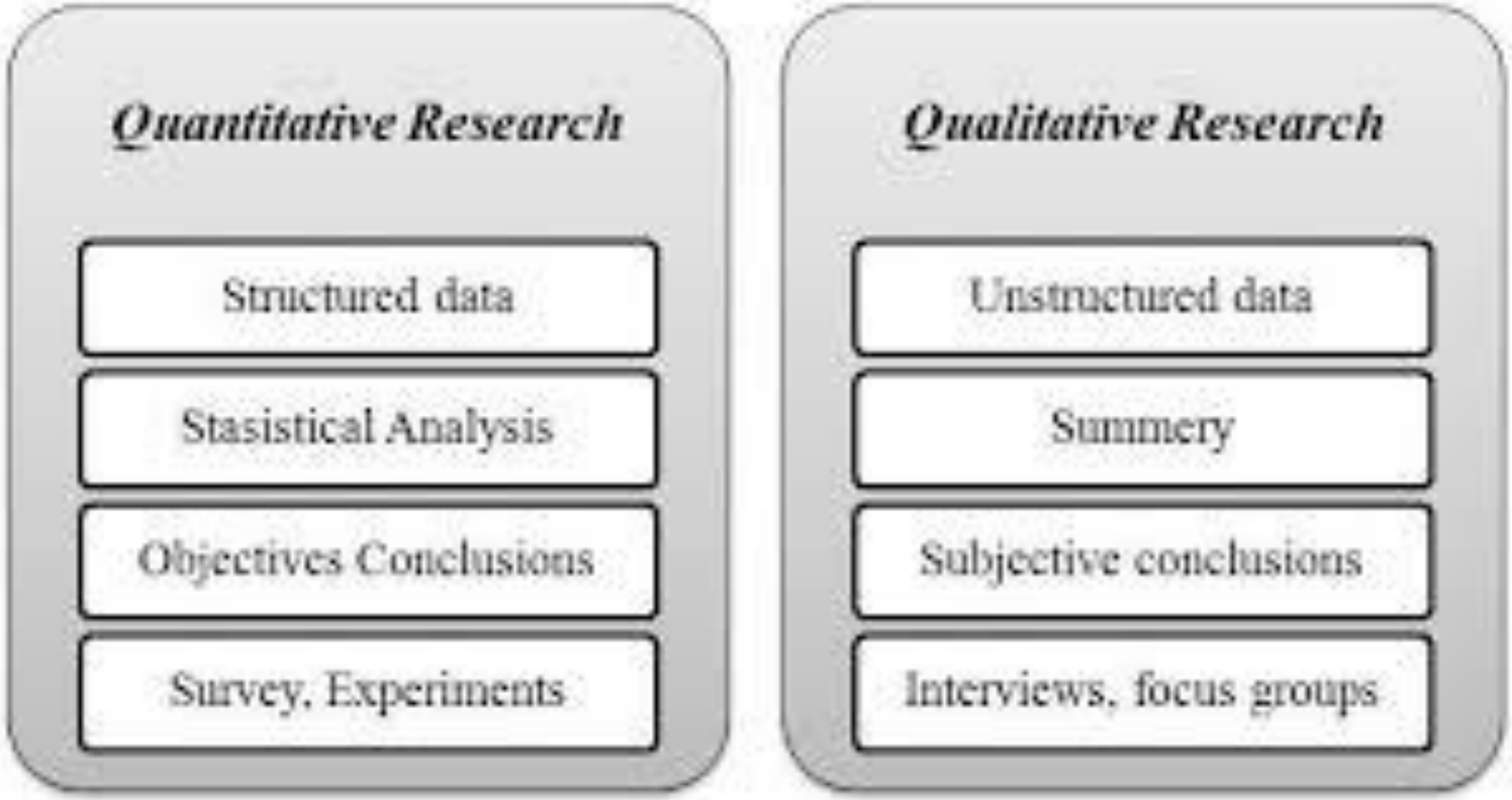
QUALITATIVE RESEARCH

Qualitative research is a type of investigation focused on understanding the "why" and "how" of human experiences, behaviors, and social phenomena.

It uses non-numerical data like interviews, observations, and text analysis to gain in-depth insights and understanding.



QUANTITATIVE VS QUALITATIVE CONTD.



QUANTITATIVE VS QUALITATIVE

SUMMARY

- Applied Research
- Fundamental Research
- Applied Vs Fundamental
- Quantitative Research
- Qualitative Research
- Quantitative Vs Qualitative

PROBLEMS FOR PRACTICE

Research and Types of research: Meaning of Research- Objectives of Research- Motivation in Research. Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical. Research Process. Criteria of good Research

LECTURE -5, CONCEPTUAL VS. EMPIRICAL

- Applied Research
- Fundamental Research
- Applied Vs Fundamental
- Quantitative Research
- Qualitative Research
- Quantitative Vs Qualitative

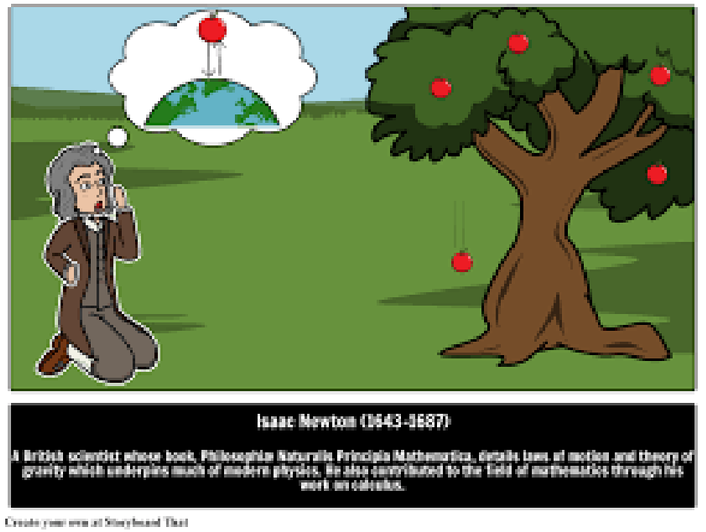
OBJECTIVE

- Conceptual Research
- Empirical Research
- Conceptual Vs Empirical
- Some other types of Research

CONCEPTUAL RESEARCH

Conceptual Research is generally used by philosophers and thinkers to develop new concepts or to interpret existing ones.

- Doesn't involve conducting any practical experiments
- The most famous example: Sir Issac Newton.
- He observed his surroundings to conceptualize and develop theories about gravitation and motion.



EMPIRICAL RESEARCH

Empirical Research is a data based research which depends on experience or observation alone.

It is data-based research, coming up with conclusions which are capable of being verified by observation or experiment

- So it is called Experimental Type Research

CONCEPTUAL VS EMPIRICAL CONTD.

CONCEPTUAL RESEARCH	EMPIRICAL RESEARCH
1. Research related to some abstract idea or theory generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones.	1. Research done on experience or observation alone, without due regard for system and theory. It is also called Experimental research as the conclusions can be verified by observation or experiment.
2. The researcher breaks down a theorem or concept into its constituent parts to gain a better & deeper understanding of the issue concerning the theorem. Conceptual research is a useful method but should be used in conjunction with other methods to produce better & understandable results.	2. The researcher provides himself with a working hypothesis to get the probable results. Facts are found to prove or disprove the hypothesis after which experimental designs are made to bring forth the desired information.

SOME OTHER TYPES OF RESEARCH

One-time Research – Research confined to a single time period.

Longitudinal Research – Research carried on over several time periods.

Diagnostic Research – It is also called clinical research which aims at identifying the causes of a problem, frequency with which it occurs and the possible solutions for it.

Exploratory Research – It is the preliminary study of an unfamiliar problem, about which the researcher has little or no knowledge. It is aimed to gain familiarity with the problem, to generate new ideas or to make a precise formulation of the problem. Hence it is also known as Formulative Research.

Experimental Research – It is designed to assess the effect of one particular variable on a phenomenon by keeping the other variables constant or controlled.

Historical Research – It is the study of past records and other information sources, with a view to find the origin and development of a phenomenon and to discover the trends in the past, inorder to understand the present and to anticipate the future.

SUMMARY

- Conceptual Research
- Empirical Research
- Conceptual Vs Empirical
- Some other types of Research

PROBLEM FOR PRACTICE

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LECTURE -6, RESEARCH PROCESS

- Conceptual Research
- Empirical Research
- Conceptual Vs Empirical
- Some other types of Research

OBJECTIVE

- Research Process
- Research Process Flow chart

RESEARCH PROCESS

The following order concerning various steps provides a useful procedural guideline regarding the research process:

(1) Formulating the Research problem;

(2) Evaluate the literature survey;

(3) Create / Developing the hypothesis;

(4) Preparing the Research design;

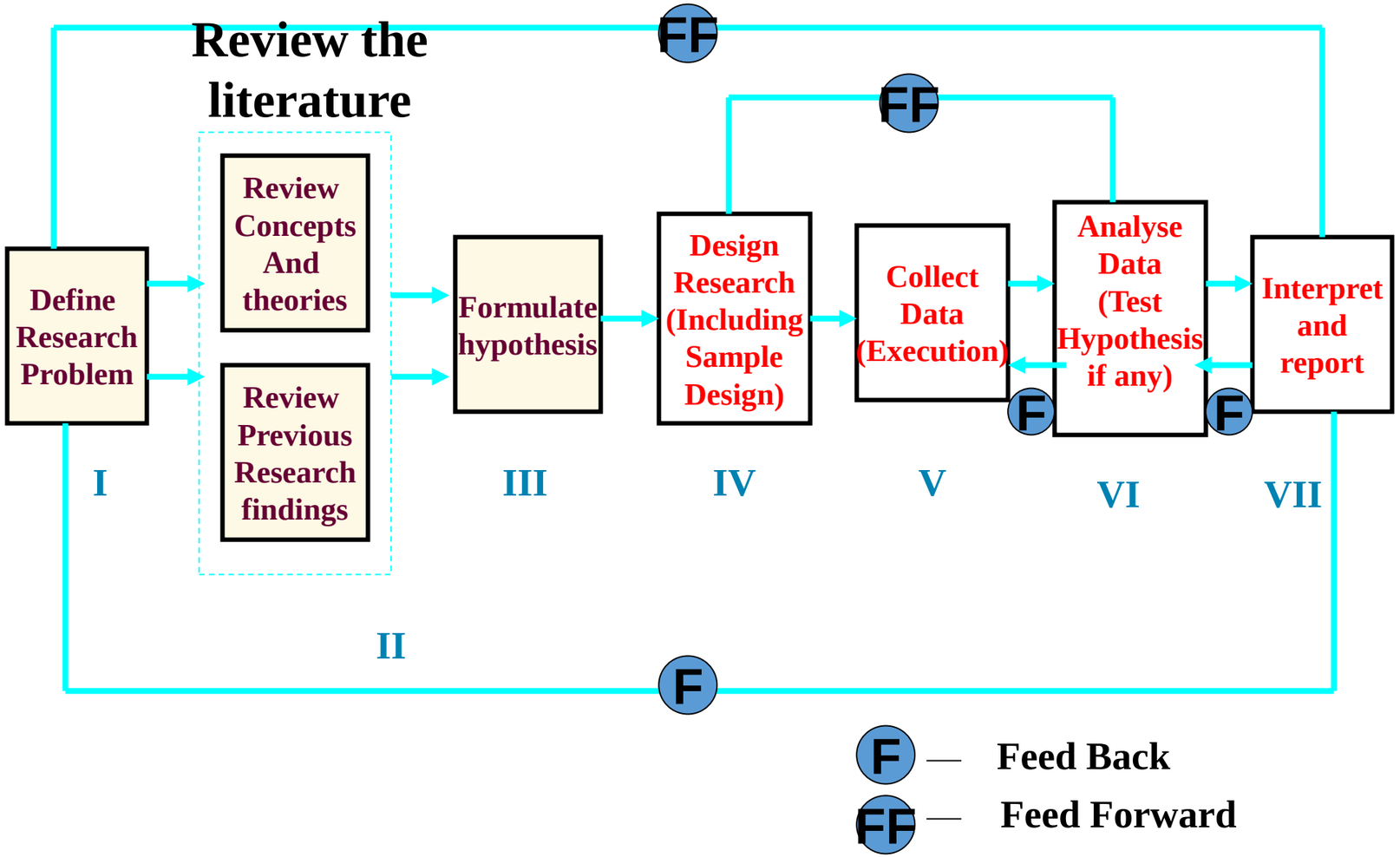
(5) Determining sample design;

(6) Collecting the data;

(7) Analysis of data;

(8) The Report-writing (or) Presentation of the Results,
i.e., formal write-up of conclusions reached.

RESEARCH PROCESS FLOW CHART



RESEARCH PROCESS CONTD.

Step 1: Identify the Research Problem

Finding an issue or formulating a research question is the first step. A well-defined Research problem will guide the researcher through all stages of the research process, from setting objectives to choosing a technique. There are a number of approaches to get insight into a topic and gain a better understanding of it.

Step 2: Evaluate the Literature Survey

A thorough examination of the relevant studies is essential to the Research process. It enables the researcher to identify the precise aspects of the problem. Once a problem has been found, the investigator or researcher needs to find out more about it.

Step 3: Create Hypotheses

Formulating an original hypothesis is the next logical step after narrowing down the research topic and defining it. A belief solves logical relationships between variables. In order to establish a hypothesis, a researcher must have a certain amount of expertise in the field.

RESEARCH PROCESS CONTD.

Step 4: Prepare the Research Design

It is the plan for achieving objectives and answering research questions. It outlines how to get the relevant information. Its goal is to design research to test hypotheses, address the research questions, and provide decision-making insights.

Step 5: Determining sample design (Describe Population)

Research projects usually look at a specific group of people, facilities, or how technology is used in the business. In research, the term population refers to this study group. The research topic and purpose help determine the study group.

Step 6: Data Collection (collecting the data)

Data collection is important in obtaining the knowledge or information required to answer the research issue. Every research collected data, either from the literature or the people being studied. Data must be collected from the two categories of researchers. These sources may provide primary data.

RESEARCH PROCESS CONTD.

Step 7: Data Analysis

During research design, the researcher plans data analysis. After collecting data, the researcher analyzes it. The data is examined based on the approach in this step. The research findings are reviewed and reported.

Step 8: The Report-writing

After completing these steps, the researcher must prepare a report detailing his/her findings. The report must be carefully composed with the following in mind:

i) The Layout: On the first page, the title, date, acknowledgments, and preface should be on the report. A table of contents should be followed by a list of tables, graphs, and charts if any.

ii) Introduction

iii) Summary of Findings

iv) Principal Report

v) Conclusion

SUMMARY

- Research Process
- Research Process Flow chart

PROBLEMS FOR PRACTICE

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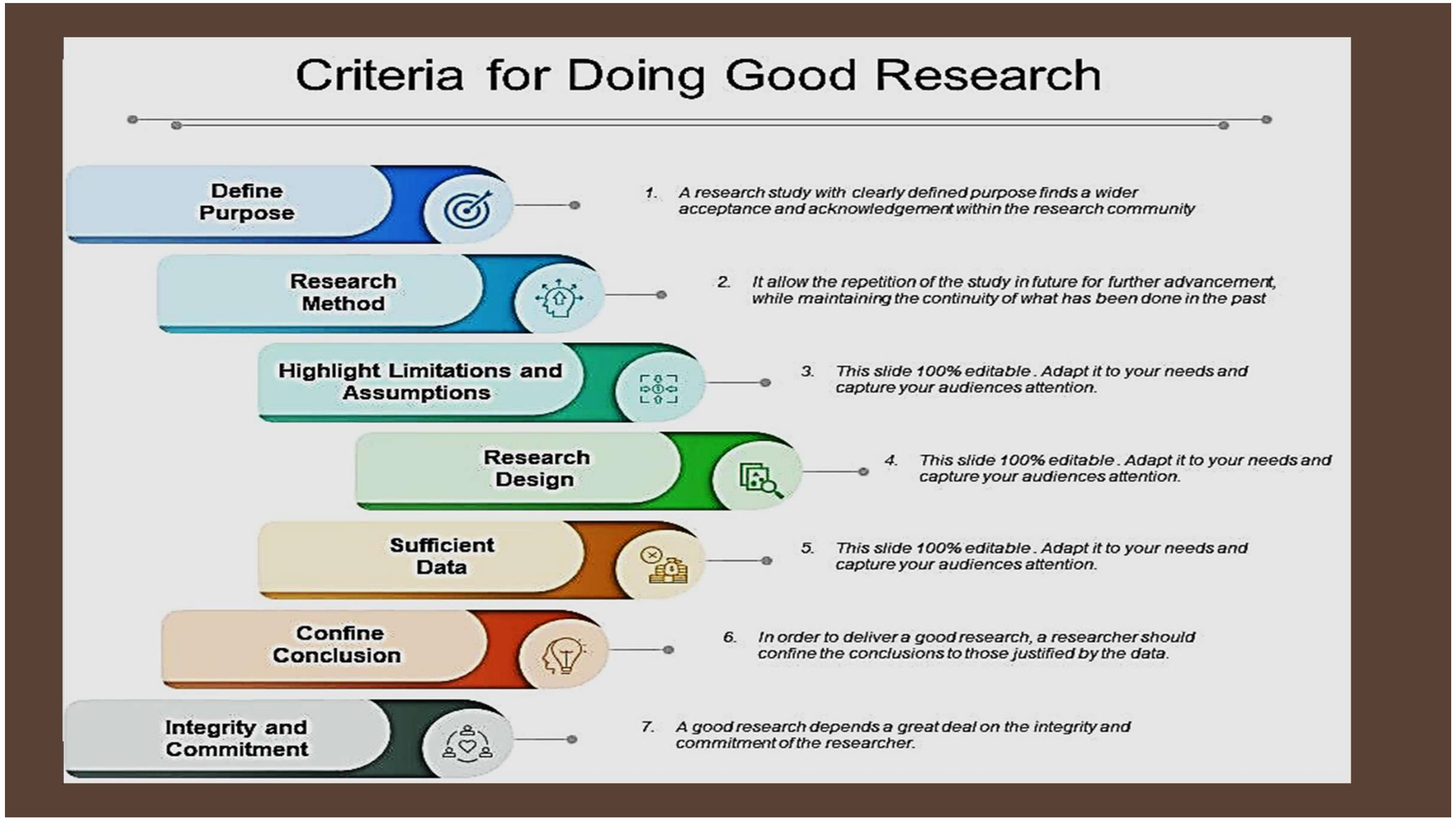
LECTURE -7, CRITERIA OF GOOD RESEARCH

- Research Process
- Research Process Flow chart

OBJECTIVE

- Criteria of Good Research

CRITERIA OF GOOD RESEARCH



CRITERIA OF GOOD RESEARCH CONTD.

1. The purpose of the research should be clearly defined and common concepts be used.
2. The research procedure used should be described in sufficient detail to permit another researcher to repeat the research for further advancement, keeping the continuity of what has already been attained.
3. The procedural design of the research should be carefully planned to yield results that are as objective as possible.
4. The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.

CRITERIA OF GOOD RESEARCH CONTD.

5. The analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate. The validity and reliability of the data should be checked carefully.
6. Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.
7. Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity

CRITERIA OF GOOD RESEARCH CONTD.

Systematic

- Structured with specified steps well defined set of rules, reject the use of guessing and intuition in arriving at conclusions.

Logical

- Guided by the rules of logical reasoning and the logical process of induction and deduction.
- **Induction:** Process of reasoning from a part to the whole
  Deduction: Process of reasoning from some premise to a conclusion

Empirical

- It implies that research is related basically to one or more aspects of a real situation and deals with concrete data that provides a basis for external validity to research results.

Replicable

- This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

CRITERIA OF GOOD RESEARCH CONTD.

1. Good research is systematic: It means that research is structured with specified steps to be taken in a specified sequence in accordance with the well defined set of rules. Systematic characteristic of the research does not rule out creative thinking but it certainly does reject the use of guessing and intuition in arriving at conclusions.

2. Good research is logical: This implies that research is guided by the rules of logical reasoning and the logical process of induction and deduction are of great value in carrying out research. Induction is the process of reasoning from a part to the whole whereas deduction is the process of reasoning from some premise to a conclusion which follows from that very premise. In fact, logical reasoning makes research more meaningful in the context of decision making.

CRITERIA OF GOOD RESEARCH CONTD.

3. Good research is empirical: It implies that research is related basically to one or more aspects of a real situation and deals with concrete data that provides a basis for external validity to research results.

4. Good research is replicable: This characteristic allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

SUMMARY

- Criteria of Good Research

PROBLEMS FOR PRACTICE

Research and Types of research: Meaning of Research- Objectives of Research- Motivation in Research. Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical. Research Process. Criteria of good Research