
The background is a dense, colorful pattern of 3D geometric shapes, primarily L-shaped and T-shaped blocks, in various colors including blue, purple, teal, orange, and green. A large white circle is centered on the slide, containing the title and authors. To the left of the circle, there are several short, pink dashed lines. To the right of the circle, there is a solid orange circle.

Introduction to Research

Dr Rubaba Azim
Dr Nooreen Adnan

The background of the slide is a solid dark blue. On the left side, there is a cluster of question marks of various sizes and shades of gray. A magnifying glass with a yellow handle and a purple lens is positioned over some of these question marks. In the top right corner of the white text box, there are three pink, hand-drawn style curved lines.

What is research?

It is an **organized inquiry** carried out to provide information for solving problems.

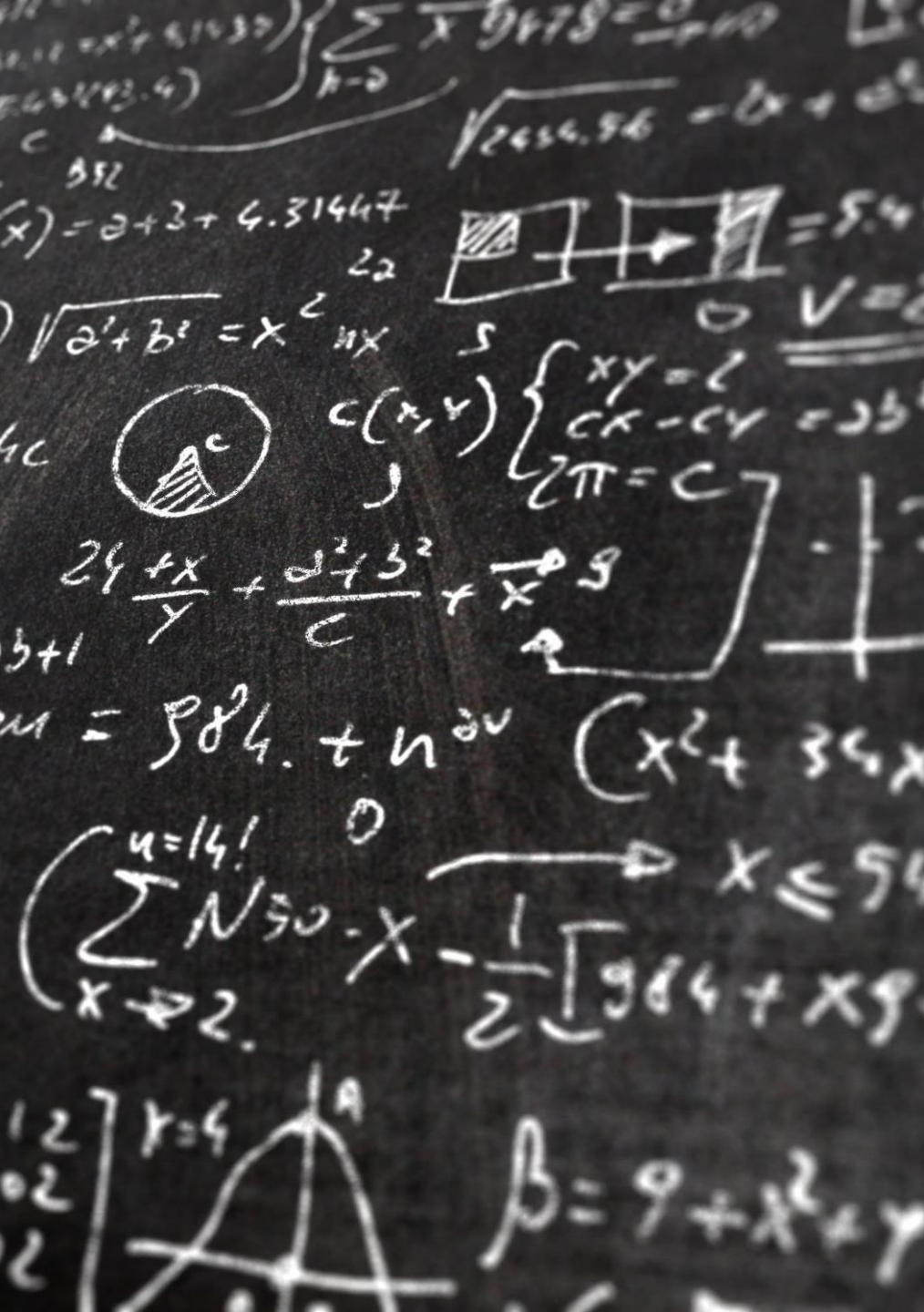
Cornerstone for every science.



Dictionary definition

Webster's Collegiate Dictionary defines research as

"studious inquiry or examination; esp: investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws".



What is Research?

- Systematic process of collecting, analyzing, and interpreting data.
- Aimed at discovering new facts, revising old theories, or applying knowledge practically.
- Involves critical thinking, curiosity, and a structured approach.
- "A movement from the known to the unknown."

What is research?



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



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



The search for knowledge through objective and systematic method of finding solution to a problem is research.

What is Research ?

Research comprises of:

WHAT (facts and conclusions)

And HOW (scientific , critical components)

Iterative process which eventually seeks to explain or solve an identified problem

Why do we conduct research?

To satisfy curiosity and build on existing knowledge.

To solve practical problems.

To inform decision-making.

To contribute to societal development.

To support policy formulation and academic learning.

Key Features of Research

- Systematic: Follows a sequence of steps.
- Objective: Free from personal bias.
- Replicable: Can be repeated.
- Empirical: Based on observations and evidence.
- Analytical: Involves data interpretation.

Research as a Voyage of discovery



Curiosity and inquisitiveness
as the driving force.



Begins with a question and
leads to knowledge.



Encourages exploration,
observation, and reflection.

Research Objectives

- To uncover hidden truths.

- To solve new or existing problems.

- To explore and develop theories.

- To inform practice or policy.

Research
Significance for
Undergraduates

Develops critical thinking
and problem-solving skills.

Enhances academic and
professional growth.

Prepares students for
advanced studies.

Encourages contribution
to society.

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Steps in Research process

1. Identifying the research problem
2. Reviewing literature
3. Formulating hypotheses or objectives
4. Designing methodology
5. Data collection
6. Data analysis and interpretation
7. Drawing conclusions
8. Reporting findings

Research Process

Review the Available
Literature

Formulate a
Question

Select an Appropriate
Research Design

Collect *Relevant*
Data

Publish
Findings

Interpret
Findings



$y = g(x)$

Secant Lines

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$
$$f(x) = \lim_{h \rightarrow 0} \frac{(x+h)^2 - x^2}{h}$$
$$= \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 - x^2}{h}$$
$$= \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$$
$$= \lim_{h \rightarrow 0} h(2x + h)$$

$g(x+h) - g(x)$

Types of Research Objectives

Exploratory/ Formulative:

Gain familiarity or new insights.

Example:

Investigating new teaching methods in classrooms




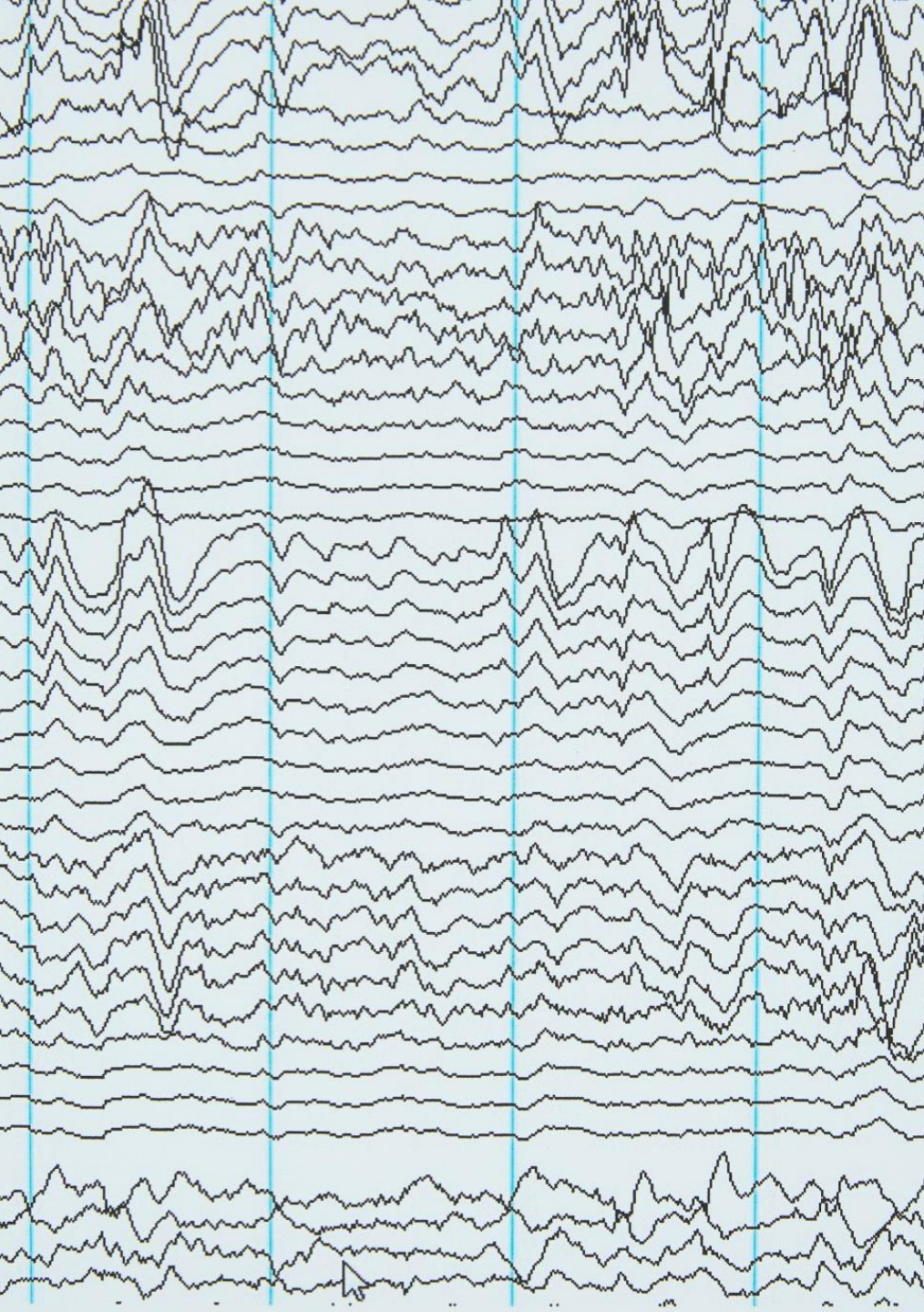
Descriptive:

Portray characteristics of individuals or groups.

Example:

Studying the demographics of university students.





Diagnostic

Determine frequency or associations

Example:

Finding links between screen time and sleep patterns.



The image shows a chalkboard with several handwritten mathematical expressions. At the top left, there is a graph of a function $y = g(x)$ with a secant line drawn through it, labeled "Secant Lines". To the right of the graph, the definition of a derivative is written as $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$. Below this, a specific example is worked out for $f(x) = x^2$. The steps are: $f'(x) = \lim_{h \rightarrow 0} \frac{(x+h)^2 - x^2}{h}$, followed by $= \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 - x^2}{h}$, and finally $= \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$. The expression $g(x+h) - g(x)$ is also written on the left side of the board.

$y = g(x)$
Secant Lines
 $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$
 $f(x) = \lim_{h \rightarrow 0} \frac{(x+h)^2 - x^2}{h}$
 $= \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 - x^2}{h}$
 $= \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$
 $g(x+h) - g(x)$
 $= \lim_{h \rightarrow 0} h(2x + h)$

Hypothesis-Testing

Test causal relationships between variables.

Example:

Testing if study hours affect exam performance.

Summary

A decorative orange dashed line consisting of several curved segments, positioned to the right of the 'Summary' text.

- Research is systematic, objective, and essential for knowledge advancement.
- Multiple objectives: exploratory, descriptive, diagnostic, hypothesis-testing.
- A vital academic activity and tool for progress.

Thank you

