BASICS OF RESEARCH

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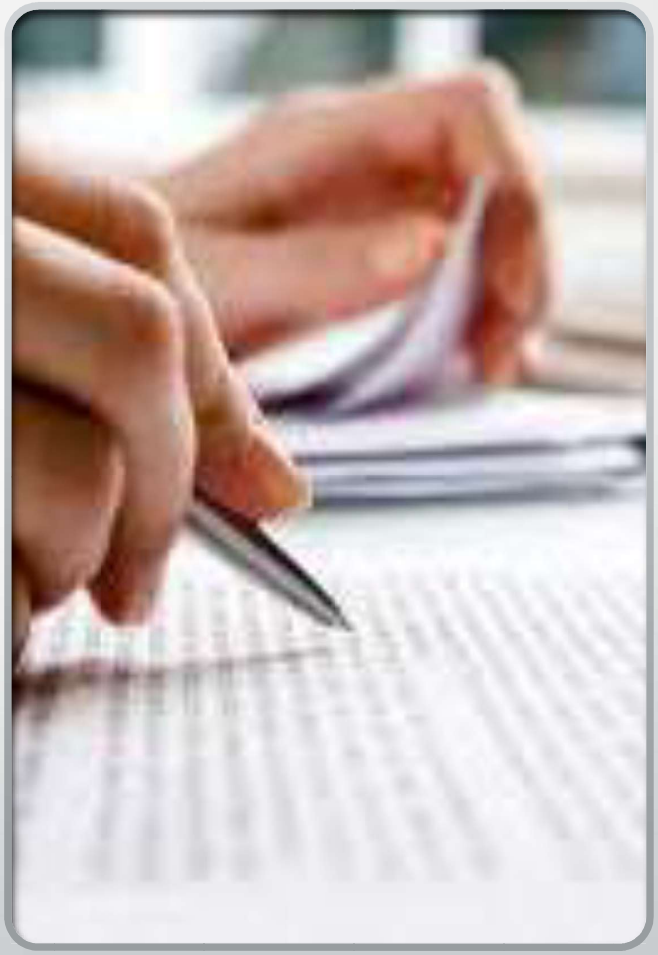
RESEARCH IS ALL ABOUT

- Adding to fundamental knowledge – revising knowledge.
- Finding a solution to the problem.
- Investigating - cause and effect relationship
- Systematic enquiry into a curiosity
- Exploring new things or phenomena

Inquiry is the engine of progress.



Basic and applied research

Adding knowledge ---------- -- applying to solve the problem

- Basic research-

  Exploring how children acquire language naturally.

- Applied Research –

  Designing improved language-learning programs based on child language acquisition research.

Qualitative study

All about non-numerical research like narratives, words and observation

- Understanding experience, perspectives without a numerical approach.

  Interviewing teachers to know their experience under NEP 2020

- Uses non-numerical data

  Observing classroom interactions to explore student behaviour patterns.

METHODS FOR QUALITATIVE STUDY

challenging as compared to ' quantitative researches'

1.	Interview methods	*In-depth insights from one interview.*
2.	Focus group	*To get collective responses*
3	Observation	*Knowing by observation in natural setting*
4	Case study	*In depth understanding of an individual or organisation*
5.	Content analysis	*Analyzing text, reports, documents,*
5.	Ethnography	*Study of culture through long term observation*
6	Grounded theory	*Framing theories from the data observed*

Examples

- **Interviews:**

  Asking nurses about their challenges in managing patient stress

- **Focus Groups:**

  Discussing attitudes toward eco-friendly products with a group of consumers.

- **Observations:**

  Watching student behaviour during group activities in a classroom

- **Case Study:**

  An in-depth analysis of how a single startup adapted during an economic crisis.

Examples

- **Content Analysis:**

  Examining newspaper articles to identify themes in media coverage of climate change.

- **Ethnography:**

  Living within a rural community to understand their cultural practices and daily routines.

- **Grounded Study (Grounded Theory):**

  Collecting and analyzing interviews with remote workers to develop a theory on work-life balance.

Quantitative research

All about numerical data

- collecting and analyzing numerical data to identify patterns
- to produce measurable and objective results.
- Easy to interpret with statistical tools used.

METHODS FOR QUANTITATIVE STUDY

challenging as compared to ' quantitative researches'

1.	Survey	Data collected through a structured questionnaire
2.	Experimental	Testing cause effect relationship by manipulating variables
3	Observation	Counting or measuring behaviour by observation (manual or mechanical)
4	Cross-sectional	Measuring a population at one point in time.
5.	Longitudinal studies	racking the same subjects over time to measure changes.
5.	Correlational Studies	Examining numerical relationships between two or more variables.

METHODS FOR QUANTITATIVE STUDY

6	Quasi-Experimental Studies:	Testing cause–and–effect relationships without full control over variables.
7.	Meta-Analysis	Statistically combining results from multiple studies to identify overall trends.

challenging as compared to ' quantitative researches'

Examples

- **Longitudinal Study:**

  Tracking students' math scores from Grade 6 to Grade 10 to measure academic growth.

- **Cross-sectional Study:**

  Surveying adults of different age groups at one time to compare exercise habits.

- **Correlational Study:**

  Examining the relationship between daily screen time and sleep duration.

Examples

Quasi-Experimental Study:

Comparing two classrooms using different teaching methods when random assignment isn't possible.

Meta-Analysis:

Combining results from multiple studies on the effectiveness of online learning to find overall trends

All research begins with curiosity.

Literature reviews

No study is isolated, but has dimensions

- Identifying Existing Knowledge
- Finding Research Gaps
- Avoiding Duplication
- Building Theoretical Foundation
- Guiding Methodology
- Supporting Arguments
- Establishing Scholarly Credibility
- Integrating Multiple Perspectives
- Refining Research Questions

Descriptive research

systematically describe characteristics, behaviours, or phenomena without influencing or modifying them.

- It focuses on what exists rather than why it exists.
  - *Conducting a survey to describe the level of job satisfaction among school teachers in a city.*
  - *Studying the demographic profile of college students (age, gender, income, etc.) in a university.*

Explorative research

explore a problem or situation with limited existing information,

- helping researchers gain insights, identify patterns, and formulate clearer research questions or hypotheses.

1. Interviewing community members to explore why young adults are losing interest in local elections.

*2. Interviewing residents to understand **emerging concerns about mental health in urban neighborhoods**.*

*3. Conducting field visits to understand **factors affecting tribal students' access to education** in remote areas.*

Experimental Research

Meaning :

A research method where the **researcher manipulates one or more variables** to observe their effect on another variable.

Testing whether a new teaching method improves students' test scores by assigning one group to the new method and another to the traditional method.

Non-Experimental Research

- **Meaning:**

  A method where the researcher does not manipulate variables but observes and measures them as they naturally occur, without any intervention.

  - *Surveying employees to measure their job satisfaction levels without influencing or altering their work environment.*

Finding a research problem

- Identify gaps in existing literature
- Observe real-world issues in your field or community.
- Review past research recommendations for suggested future studies.
- Discuss with experts or stakeholders to spot unresolved issues.
- Analyse trends or emerging challenges in society, technology, or policy.

Research objectives

Should be :

- Clear
- Specific
- Measurable
- Maximum of 6 or 7

To study, to explore, to analyse, to assess, to evaluate—

Hypotheses of the study

Null hypothesis :

No relationship between variables assumed

Alternative hypothesis:

There is a relationship

- Assumption or supposition to be tested.
- Based on objective
- Statistically to be proved.

establish a prediction about the relationship between variables, based on theory or prior evidence.

Data methodology

- **Primary Data:**

  Data collected firsthand by the researcher directly from respondents or sources for a specific study.

- **Secondary Data:**

  Data already collected by others and used from existing sources like books, reports, articles, or databases.

SAMPLING METHODS

Probability sampling

The universe is known

1	Simple Random	Every individual has an equal chance of being selected.
2	Systematic	Selecting every nth individual from a list.
3	Stratified	Dividing the population into groups (strata) and sampling from each.
4	Cluster	Selecting entire groups or clusters randomly instead of individuals.
5	Multiphase sampling	A sampling method where data is collected in multiple stages, moving from broader samples to more detailed or refined samples to improve accuracy and efficiency.

SAMPLING METHODS

Non-probability sampling

Universe not known

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1	Convenience	Choosing participants who are easy to access.
2	Purposive	Based on certain criteria
3	Snowball sampling	Referral or network way finding people
4	Quota sampling	Selecting participants to meet a predefined number for each category.

EXAMPLES

1. **Simple Random Sampling**

   Selecting 50 students from a school using a random number generator.

2. **Systematic Sampling**

   Choosing every 10th name from a hospital patient list.

3. **Stratified Sampling**

   Dividing employees into departments (HR, Finance, IT) and randomly selecting from each group.

4. **Cluster Sampling**

   Randomly selecting 5 villages from a district and surveying all households in those villages.

EXAMPLES

1. **Convenience Sampling**

   Surveying shoppers who are readily available at a mall entrance.

2. **Purposive Sampling**

   Selecting only mothers of newborns to study breastfeeding practices.

3. **Snowball Sampling**

   Interviewing drug rehabilitation patients who then refer other eligible participants.

4. **Quota Sampling**

   Selecting 20 males and 20 females to meet a fixed gender quota for a study.

Multidisciplinary Research

- Researchers from different disciplines work on a common problem side by side, but each stays within their own field.
- Disciplines do not integrate their methods; they just contribute separately.

- Examples:
  - A biologist studies ecosystem impacts
  - An economist studies economic costs
  - A sociologist studies community behaviour

Interdisciplinary Research

- Researchers from different disciplines work together and integrate knowledge and methods.
- The goal is to create a coordinated, combined approach.

- Poverty and Social Inequality Studies:
  - Sociology + Economics + Political Science + Psychology
- Public Health and Social Behaviour:
  - Psychology + Sociology + Anthropology + Public Health
- Urban Development and Human Behaviour:
  - Geography + Sociology + Economics + Environmental Studies

Transdisciplinary Research

- Goes beyond academic disciplines.
- Researchers integrate knowledge across disciplines and work with stakeholders outside academia.

- **Sustainable Urban Planning "Smart Cities:**

Urban geography, engineering, data science, economics, public policy, architecture + stakeholders (City planners, residents, tech industries, local businesses)

- **Public Health Responses to Pandemics (e.g., COVID-19)**

Medicine, epidemiology, psychology, sociology, economics government, hospitals, schools, community leaders, media

Thank you