

# Types of Scientific Research

## 1. Quantitative Research

Quantitative research is a scientific approach that relies on collecting and analyzing numerical data statistically in order to test hypotheses or identify relationships between variables. This type of research aims at the objective measurement of phenomena and the generalization of results to the target population through the use of standardized measurement tools such as questionnaires, psychological scales, and tests.

### ➤ Main Characteristics:

- Relies on numbers, ratios, and statistical indicators.
- Uses large samples that allow for generalization.
- Seeks objectivity and control over variables.
- Begins with predetermined hypotheses to be tested.
- Common tools include closed-ended questionnaires, standardized scales, psychological tests, and structured observation.

### ❖ Applied Example:

A study investigating the relationship between academic motivation and academic achievement using a quantitative scale and Pearson's correlation coefficient.

## 2. Qualitative Research

Qualitative research is an approach that seeks to understand human phenomena within their natural contexts by interpreting meanings, experiences, and behaviors rather than measuring them numerically.

It focuses on depth rather than breadth, and on describing human experiences from the participants' own perspectives.

➤ **Main Characteristics:**

- Relies on texts, words, and images rather than numbers.
- Focuses on meaning and interpretation instead of measurement.
- Uses small, purposeful samples (purposeful sampling).
- Does not begin with hypotheses but with open-ended questions that may evolve during the research process.
- Common tools include in-depth interviews, participant observation, content analysis, and focus groups.

❖ **Applied Example:**

A study exploring the experiences of special education teachers in integrating technology in classrooms through open-ended interviews and thematic content analysis.

### **Brief Comparison Between Quantitative and Qualitative Research**

<b>Aspect</b>	<b>Quantitative Research</b>	<b>Qualitative Research</b>
<b>Objective</b>	Measuring relationships and testing hypotheses	Understanding phenomena and behaviors in depth
<b>Type of Data</b>	Numerical	Descriptive (texts, interviews...)
<b>Sample Size</b>	Large and generalizable	Small and purposeful

<b>Aspect</b>	<b>Quantitative Research</b>	<b>Qualitative Research</b>
<b>Data Collection Tools</b>	Questionnaires, tests	Interviews, observation, content analysis
<b>Analysis Method</b>	Statistical analysis	Thematic or interpretive analysis
<b>Outcome</b>	Quantitative generalizations and conclusions	Contextual, interpretive understanding

**Reference:**

1-Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). Sage Publications.

2- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative Research: A Guide to Design and Implementation* (4th ed.). Jossey-Bass.