

Outline

1. An Introduction to Quantitative Research Method
2. Concepts of Quantitative Methods
 - ❖ Sampling & Population
 - ❖ Questionnaire Design & Measurement Scales

What is Quantitative Research ?

- **In a nutshell, quantitative research generates numerical data or information that can be converted into numbers.**
- Only measurable data are being gathered and analyzed in quantitative research.
- Quantitative Research is an inquiry into an identified problem, based on testing a theory measured with numbers, and analyzed using Statistical Techniques.
- Quantitative Research is “Explaining Phenomena by Collecting numerical data that are analyzed using mathematically based on methods (in particular statistics)”. Aliaga and Gunderson (2000).

- **Goal or Aim of the Research:**

- The primary aim of a Quantitative Research is to focus more in counting and classifying features and constructing statistical models and figures to explain what is observed.

Quantitative Research is highly recommended for the late phase of research because it provides the researcher a clear picture of what to expect in his research compared to Qualitative Research.

- **Data Gathering Instrument**

Quantitative Research make use of tools such as questionnaires, surveys, measurements and other equipment to collect numerical or measurable data.

Ex. Height, shoe size, length of nails

- **Type of data**

If you are conducting a Quantitative Research, what will most likely appear in your discussion are tables containing data in the form of numbers and statistics.

Units and Variables in Quantitative Data

- **Units**

When we collect data in Quantitative Educational Research, we have to collect the from someone or something. The people or things (e.g schools) we collect data on or from are known as units or cases.

- **Variables**

the data that we are collecting from these units are known as variables. Variables are any characteristics of the unit we are interested in and want to collect (e.g. gender, age, self-esteem).

Types of Quantitative Research Design

- **Explanatory Research** – is a research method that explores why something occurs when limited information is available. Can also explained as “cause and effect” model investigating patterns and trends in existing data that haven’t been previously investigated.
- **EXPERIMENTAL RESEARCH** – often called true experimentation, uses the scientific method to establish the cause and effect relationship among group of variables that make up a study.

Types of Quantitative Research Design

- **CAUSAL- COMPARATIVE**

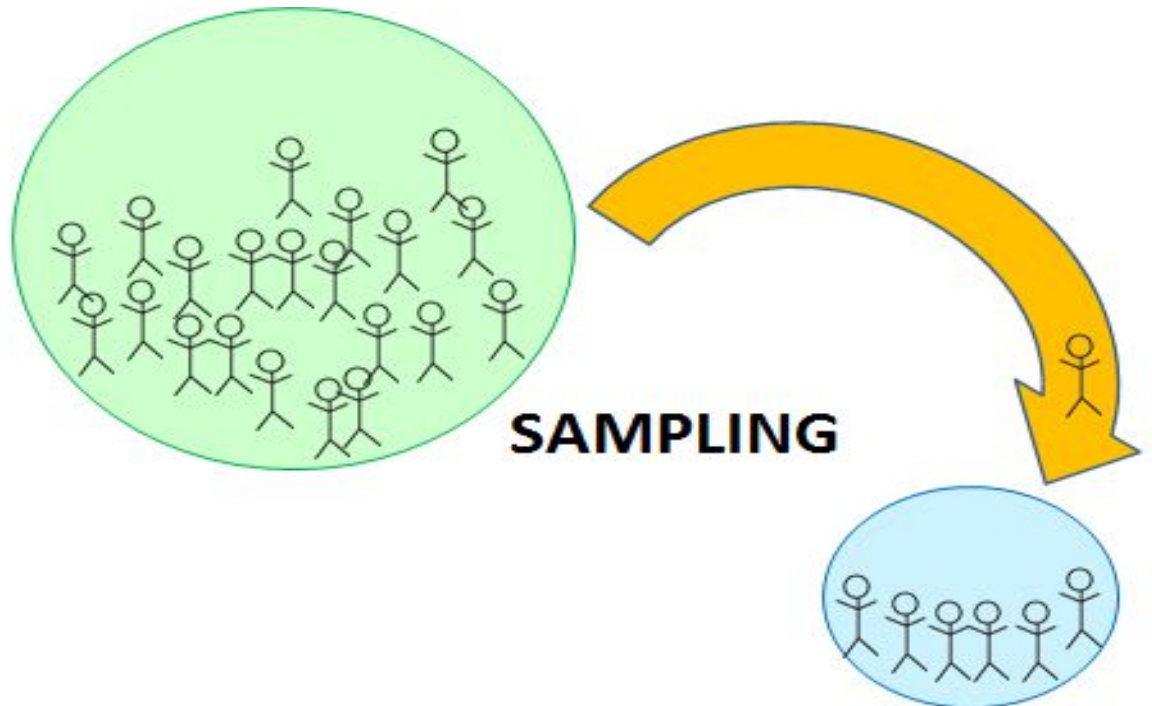
A causal-comparative design is a research design that seeks to find relationships between independent and dependent variables after an action or event has already occurred. The researcher's goal is to determine whether the independent variable affected the outcome, or dependent variable, by comparing two or more groups of individuals.

Sampling

- A process used in statistical analysis in which a predetermined number of observations will be taken from a larger population.

Two Main types of Sampling

- Probability sampling
- Non- probability sampling



• Probability Sampling Methods

Probability or random sampling gives all members of the population a known chance of being selected for inclusion in the sample and this does not depend upon previous events in the selection process.

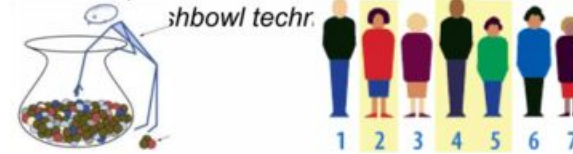
Four basic types of random techniques:

1. Simple Random Sampling
2. Systematic Sampling
3. Stratified Sampling
4. Cluster or multi-stage Sampling

Probability Sampling

1. Simple Random Sampling

- Lottery Method - write the names or codes on a piece of paper, put them in a container, then randomly select the desired number of samples. Sometimes



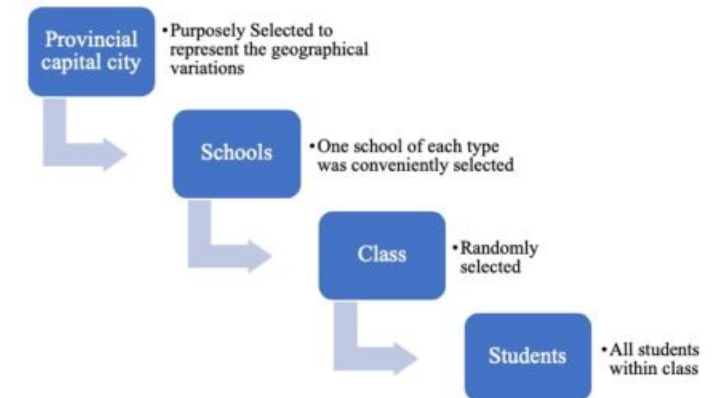
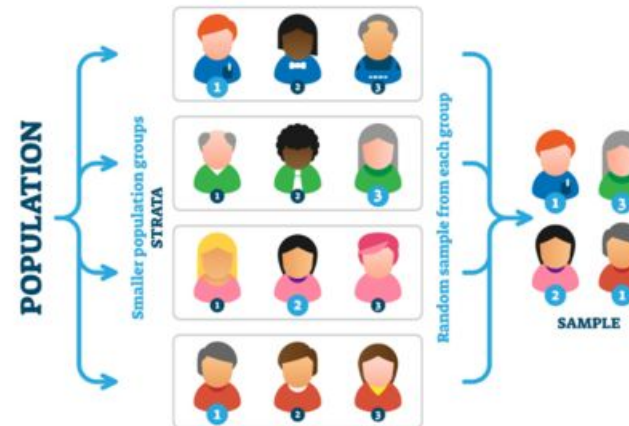
Systematic Sampling

List the population with serial numbers.

- Determine the sample size.
- Divide the population by SS to find out Kth case.
- Randomly start taking every kth case.
- Go on picking every kth case.
- Continue even afresh till you complete the sample size.



STRATIFIED SAMPLING



Types of Non-Probability Sampling

- **Convenience Sampling** - Participants are chosen because they are easy to reach or readily available to the researcher.
- **Purposive Sampling** - Participants are chosen because they have specific knowledge or characteristics, knowledge or experiences relevant to the study.
- **Quota Sampling** - Participants are selected to fill a required number for particular groups, without random selection.
- **Snowball Sampling**: Existing participants help the researcher find other participants.
- **Consecutive Sampling** - the researcher selects every available participant who meets the study's criteria until the desired sample size is reached, usually within the a specified period.

POPULATION

- is the entire group of people, objects, or events that a researcher wants to study.

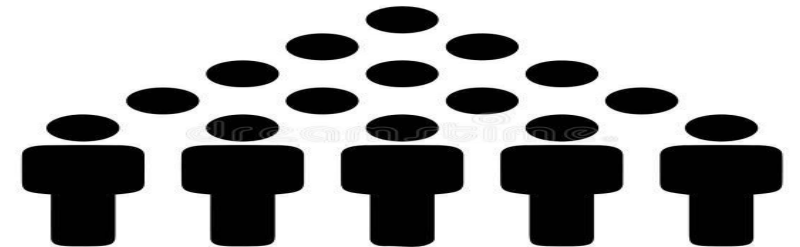
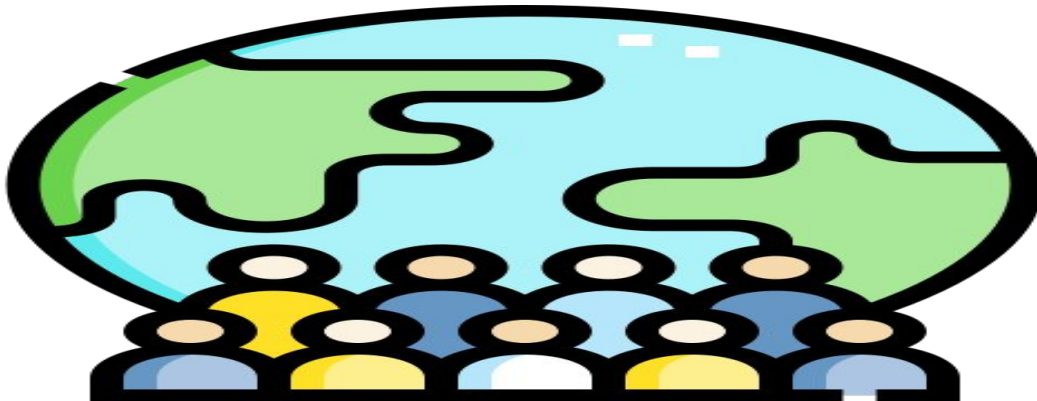
Four Types of Population

Target Population - The entire group the researcher wants to study.

Accessible Population - the part of the target population that the researcher can realistically reach.

Finite Population - A population with a specific , countable number of members.

Infinite Population - a population with an unlimited number of possible observations, or one treated as unlimited for statistical purposes.



Questionnaire Design

- A **questionnaire** is a list of questions or items used to gather data from respondents about their attitudes, experiences, or opinions. Questionnaires can be used to collect quantitative and/or qualitative information.
- Questionnaires are commonly used in market research as well as in the social and health sciences. For example, a company may ask for feedback about a recent customer service experience, or psychology researchers may investigate health risk perceptions using questionnaires.

Questionnaires vs. surveys

- A **survey** is a research method where you collect and analyze data from a group of people. A **questionnaire** is a specific tool or instrument for collecting the data.

PRELIMINARY DECISIONS IN QUESTIONNAIRE DESIGN

There are nine steps involved in the development of a questionnaire:

1. Decide the information required.
2. Define the target respondents.
3. Choose the method(s) of reaching your target respondents.
4. Decide on question content.
5. Develop the question wording.
6. Put questions into a meaningful order and format.
7. Check the length of the questionnaire.
8. Pre-test the questionnaire.
9. Develop the final survey form.

QUESTION?

What is a good questionnaire?

Questionnaire Design

Valid

A valid questionnaire should ask what it intends to ask, i.e. the questions should be phrased in such a way that the respondent understands the objective of the question. To achieve this, the questionnaire should be reviewed by the “content expert” during the pilot test (e.g. if the target respondent is a diabetic patient, then a diabetic patient should comment whether he understands the questionnaire). Any uncertainties and queries should be clarified till the question is clearly understood.

Reliable

A reliable questionnaire should yield the same answer if the same question is posed to the respondent repeatedly in a short span of time. This can be achieved by performing a “test-retest”, i.e. administer the same questionnaire to the respondent a second time and check for consistency of the answer. Any discrepancy in the answers could be due to lack of clarity of the questions and this should be reviewed and rephrased.

Questionnaire Design

Interesting

An interesting questionnaire is more likely to be completed by the respondent and hence yields a better response rate. This requires the researcher to put some thoughts into asking questions that are relevant to the respondent and in a logical sequence.

Succinct

A succinct questionnaire asks questions that aim to answer only the research objectives. Any questions beyond the scope of the research should be excluded. It is common for researchers to “cast the net wider” so that they will collect more data, regardless of whether these data are important or not. This usually happens when the researcher has not properly thought through the research objectives. It runs the risk of asking too many questions and the questionnaire runs into many pages.

QUESTION TYPES

- **Closed-Ended:** Provide fixed choices (such as multiple-choice, check-all-that-apply, or Likert scales) for fast, standardized analysis.
- **Open-Ended:** Allow free-text responses to capture rich, unexpected insights, though they require more time to code.
- **Hybrid (Open Response-Option):** Combine fixed choices with an "Other (please specify)" text field.

EXAMPLE OF CLOSE OPEN-ENDED QUESTION

Type	Main purpose	Example
Descriptive	Describe a situation	How would you describe your workplace?
Explanatory	Explain why or how	Why is teamwork important?
Opinion-based	Gather opinions	What is your opinion about the policy?
Experience-based	Explore experiences	Tell me about a difficult work experience.
Problem-identification	Identify issues	What problems do employees face?
Suggestion-based	Gather recommendations	How can management improve?
Reflective	Identify lessons learned	What did you learn from the experience?
Comparative	Compare situations	How do the two leadership styles differ?
Hypothetical	Explore possible responses	What would you do in this situation?
Process-based	Understand procedures	How do you resolve workplace conflicts?
Future-oriented	Explore expectations	What changes do you expect in the future?
Root-cause/probing	Explore underlying reasons	What factors caused the problem?

EXAMPLE OF CLOSE-ENDED QUESTION

Type	Main response format
Dichotomous	Yes / No
Multiple choice	Choose from options
Rating scale	Rate using a scale
Likert scale	Agree / Disagree
Ranking	Arrange options by order
Numerical	Enter a number
Frequency	Never to Always, or similar categories
Checklist	Select all that apply
Semantic differential	Rate between opposite descriptions
Identification/classification	Select a category

EXAMPLE OF HYBRID-ENDED QUESTION

Type of hybrid question	Closed-ended component	Open-ended component
Yes/No + Explanation	Yes / No	Why or why not?
Multiple Choice + Explanation	Select an option	Explain your choice
Rating Scale + Explanation	Choose a rating	Explain the rating
Likert Scale + Explanation	Agree or disagree	Explain your opinion
Frequency + Explanation	How often?	Explain the circumstances
Ranking + Explanation	Rank the options	Explain your priorities
Checklist + Explanation	Select all that apply	Describe or explain a selection
Numerical + Explanation	Enter a number	Explain the result
Demographic Choice + Explanation	Select a category	Describe the related experience
Situational Choice + Explanation	Select an action	Explain the decision

MEASUREMENT SCALES OF QUANTITATIVE RESEARCH

- 4 TYPES:

1. **NOMINAL** (CATEGORIES) : represents the lowest level of measurement .
2. **ORDINAL** (RANKS) : puts the subjects in order from the highest to lowest, from the most to least.
3. **INTERVAL** (scores) : has all the characteristics of a nominal and ordinal scale, in addition it is based upon predetermined equal intervals.
4. **RATIO** : a scale represents the highest, most precise, level of measurement.

Nominal Scale

A nominal scale is the 1st level of measurement scale in which the numbers serve as “tags” or “labels” to classify or identify the objects. A nominal scale usually deals with the non-numeric variables or the numbers that do not have any value.

Characteristics of Nominal Scale

- A nominal scale variable is classified into two or more categories. In this measurement mechanism, the answer should fall into either of the classes.
- It is qualitative. The numbers are used here to identify the objects.
- The numbers don't define the object characteristics. The only permissible aspect of numbers in the nominal scale is “counting.”

Example:

An example of a nominal scale measurement is given below:

What is your gender?

M- Male

F- Female

Here, the variables are used as tags, and the answer to this question should be either M or F.

Ordinal Scale

The ordinal scale is the 2nd level of measurement that reports the ordering and ranking of data without establishing the degree of variation between them. Ordinal represents the “order.” Ordinal data is known as qualitative data or categorical data. It can be grouped, named and also ranked.

Characteristics of the Ordinal Scale

- The ordinal scale shows the relative ranking of the variables
- It identifies and describes the magnitude of a variable
- Along with the information provided by the nominal scale, ordinal scales give the rankings of those variables
- The interval properties are not known
- The surveyors can quickly analyse the degree of agreement concerning the identified order of variables

Example:

- Ranking of school students – 1st, 2nd, 3rd, etc.
- Ratings in restaurants
- Evaluating the frequency of occurrences
 - Very often
 - Often
 - Not often
 - Not at all
- Assessing the degree of agreement
 - Totally agree
 - Agree
 - Neutral
 - Disagree
 - Totally disagree

Ratio Scale

The ratio scale is the 4th level of measurement scale, which is quantitative. It is a type of variable measurement scale. It allows researchers to compare the differences or intervals. The ratio scale has a unique feature. It possesses the character of the origin or zero points.

Characteristics of Ratio Scale:

- Ratio scale has a feature of absolute zero
- It doesn't have negative numbers, because of its zero-point feature
- It affords unique opportunities for statistical analysis. The variables can be orderly added, subtracted, multiplied, divided. Mean, median, and mode can be calculated using the ratio scale.
- Ratio scale has unique and useful properties. One such feature is that it allows unit conversions like kilogram – calories, gram – calories, etc.

Example:

An example of a ratio scale is:

What is your weight in Kgs?

- Less than 55 kgs
- 55 – 75 kgs
- 76 – 85 kgs
- 86 – 95 kgs
- More than 95 kgs

Interval Scale

The interval scale is the 3rd level of measurement scale. It is defined as a quantitative measurement scale in which the difference between the two variables is meaningful. In other words, the variables are measured in an exact manner, not as in a relative way in which the presence of zero is arbitrary.

Characteristics of Interval Scale:

- The interval scale is quantitative as it can quantify the difference between the values
- It allows calculating the mean and median of the variables
- To understand the difference between the variables, you can subtract the values between the variables
- The interval scale is the preferred scale in Statistics as it helps to assign any numerical values to arbitrary assessment such as feelings, calendar types, etc.

Example:

- Likert Scale
- Net Promoter Score (NPS)
- Bipolar Matrix Table

QUICK COMPARISON TABLE:

Scale	Has Order?	Equal Intervals?	True Zero?	Common Central Tendency
Nominal	No	No	No	Mode
Ordinal	Yes	No	No	Median
Interval	Yes	Yes	No	Mean
Ratio	Yes	Yes	Yes	Mean / Geometric Mean

MIM 101 Advanced Business Research - Qualitative Research

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QUALITATIVE SAMPLING STRATEGIES AND DATA COLLECTION TECHNIQUES

Characteristics of Qualitative Research

Qualitative Research – a method of inquiry that focuses on understanding human experiences, behaviors, and social contexts.

Natural Setting

Typically gather data at the location where participants encounter the phenomenon under investigation

Research as key instrument

Collect data themselves by examining documents, behavior, or interviewing participants

Multiple Sources of Data

Interviews, observations, documents, audio-visual information are gathered

Inductive and deductive data analysis

Patterns, categories, themes, are built inductively. Evidence from data to support each theme are obtained deductively

Participants' meaning

Meaning of the problem or issue is the focus of the research

Emergent Design

Some phases of the process may shift or change once data collection begins

Reflexivity

Reflect their role in the study and how their culture, personal background and experiences may affect data interpretation

Holistic Account

Seeks to develop a complex picture of the problem or issue under study by identifying the many factors involved

QUALITATIVE SAMPLING STRATEGIES AND DATA COLLECTION TECHNIQUES

Characteristics of Qualitative Research



QUALITATIVE SAMPLING STRATEGIES AND DATA COLLECTION TECHNIQUES

Qualitative Sampling Strategies

Meaning: Qualitative sampling strategies are the methods used to deliberately select the people, cases, or settings that can give the richest information on a topic. The goal is depth and understanding, not statistical representation.

Purposive

Select people with specific characteristics or experience relevant to the study.

Maximum variation

Deliberately include diverse cases to capture a wide range of perspectives.

Snowball

Participants refer others; useful for hard-to-reach or hidden groups.

Convenience

Whoever is accessible and willing. Fast, but weakest for credibility.

Quota

Fill set numbers per category (e.g., age, role) to ensure coverage.

Theoretical

Sample guided by emerging concepts until categories are fully developed.



Sample size: Depth over breadth. Keep collecting and analyzing until saturation (new data adds no new themes), often about 9–17 interviews or 4–8 focus groups.

QUALITATIVE SAMPLING STRATEGIES AND DATA COLLECTION TECHNIQUES

Data Collection Techniques

Meaning: Data collection techniques are the systematic ways researchers gather information, such as words, behaviors, and documents, to understand participants' experiences and the meanings they give to them.

Technique	Best for	Watch out for
In-depth interviews	Personal experiences, motives, sensitive topics	Interviewer bias; time-consuming to transcribe
Focus group discussions	Group norms, shared views, idea generation	Dominant voices; less suited to sensitive topics
Observation	Actual behavior and context, not just what people say	Observer effect; ethical access and consent
Document analysis	Policies, records, history, and context	Incomplete or biased records; authenticity



Keep it credible: obtain informed consent, reflect on your own influence, triangulate methods or sources, and keep an audit trail of notes and decisions.

QUALITATIVE RIGOR: CREDIBILITY, TRANSFERABILITY AND AUDIT TRAILS

Rigor: a holistic commitment to quality, transparency, and methodological integrity across every phase of a study.

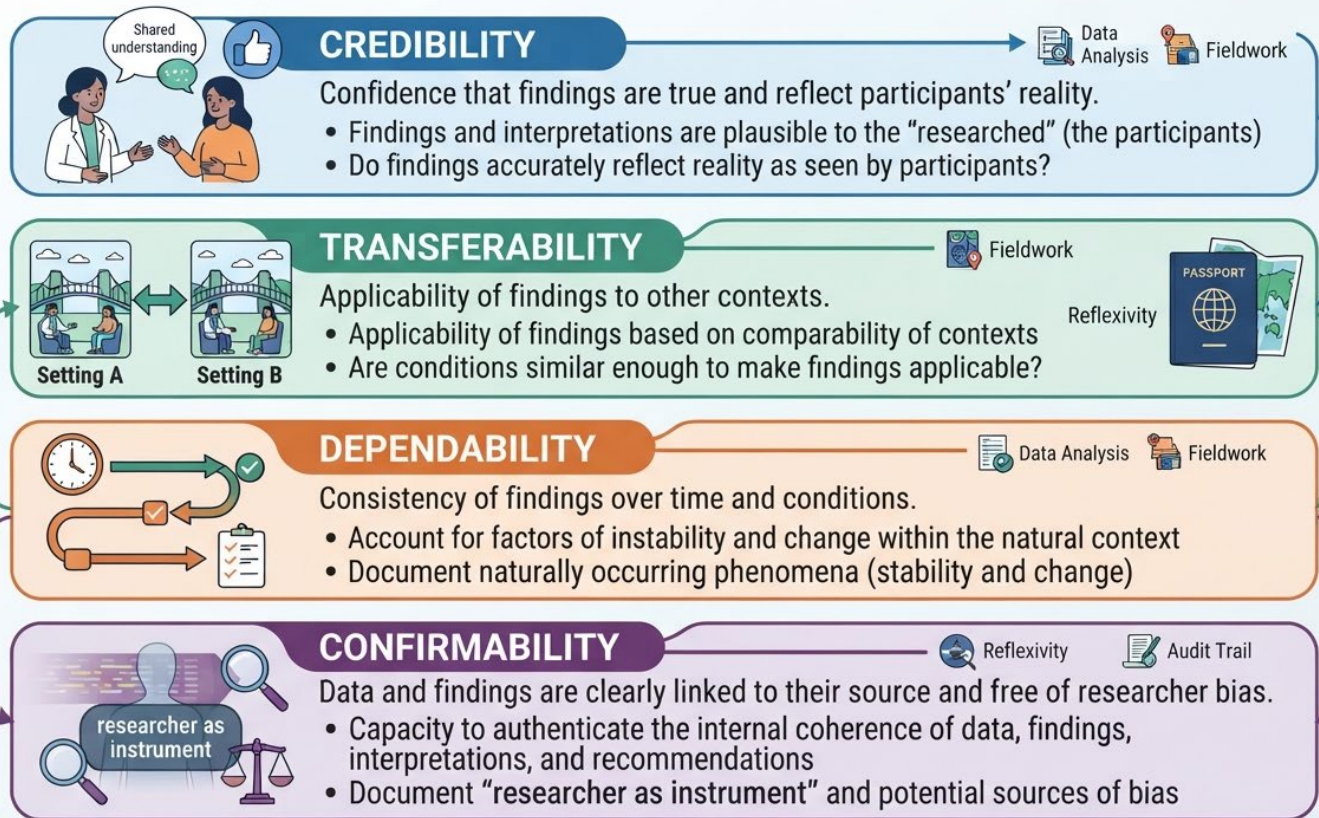
Lincoln & Guba, 1985; Tracy, 2010

QUALITATIVE RIGOR: CREDIBILITY, TRANSFERABILITY AND AUDIT TRAILS

The 4 key standards provides an approach in assessing the quality of a qualitative research

This model replaces traditional quantitative metrics (validity and reliability) with four criteria.

Trustworthiness Criteria in Qualitative Research



QUALITATIVE RIGOR: CREDIBILITY, TRANSFERABILITY AND AUDIT TRAILS

Actions that will ensure the trustworthiness criteria

- **Credibility** – *prolonged engagement, triangulation, etc.*
- **Transferability** – *thick description, purposive sampling, etc.*
- **Dependability** – *audit trail, stepwise replication*
- **Confirmability** – *reflexive journal, confirmability audit*





THANK YOU