



MODULE

1

Lesson Title: CHARACTERISTICS, STRENGTHS, WEAKNESSES, KINDS OF QUANTITATIVE RESEARCH



OBJECTIVES

At the end of the lesson, you are expected to:

1. describe characteristics, strengths, weaknesses, and kinds of quantitative research
- Additional objectives:
2. define quantitative research;
 3. explain the characteristics of quantitative research;
 4. point out the strengths and weaknesses of quantitative research;
 5. judge the applicability of research designs; and
 6. appraise the value of concepts learned about quantitative research.



INTRODUCTION

Hello learners! Welcome to the world of **research** 😊. Practical Research I introduced you to the two main classifications of research methods: **quantitative** and **qualitative**. You have learned that qualitative research is more of describing a phenomenon in a narrative form; hence, the data collected can be in the form of words, images, or transcripts taken from a small sample, not generalizable to the population. Choosing a small sample size makes room for in-depth data collection and interpretation. In this lesson, you will learn about quantitative analysis, a more formal, objective, and systematic approach to obtaining answers to a question or problem of the study. If you're ready, then let's activate our investigative skills and let's begin!



LET'S DISCUSS!

Let's take some notes!

During the course of discussion in the following lesson content, make sure to take significant handwritten notes following the prescribed note-taking pattern (Cornell Note-Taking Method) guided by the provided rubrics.

DEFINITION OF QUANTITATIVE RESEARCH

Quantitative research is an **objective, systematic empirical investigation** of observable phenomena through the use of computational techniques. It highlights numerical analysis of data hoping that the numbers yield unbiased results that can be generalized to some larger population and explain a particular observation. Simply, quantitative research is concerned with numbers and their relationship with events.

Expressions like numerical forms, **objective thinking, statistical methods**, and measurement signal the existence of quantitative research. One word that reflects the true nature of this type of research is numerical. This term, **numerical**, is a descriptive word pertaining to or denoting a number or symbol to express how many, how much, or what rank things are or have in this world. Expressing meaning through numerals, or a set of symbols indicates specificity, particularity, or exactness of something.

The quantitative research suggests that the data concerned can be analyzed in terms of numbers. An **example** that we can give for this study is a study comparing the performance of Grade 12 in Section A and Section B in Physical Science when ICT is integrated in teaching. This can be approached by getting the average performance of both schools before and after integrating ICT. Then the averages can be compared and analyzed to see the differences or effectiveness. In this case, numbers are used as data for analysis. Another is surveying what do viewers in Davao City prefer to watch: is it GMA *dramarama* or ABS-CBN Golden *Kapamilya* noontime show. In here, it may be approached by making a survey questionnaire asking for the preference of viewers in Davao City.

CHARACTERISTICS OF QUANTITATIVE RESEARCH

- 1. OBJECTIVE.** Quantitative research seeks accurate measurement and analysis of target concepts. It is not based on mere intuition and guesses. Data are gathered before proposing a conclusion or solution to a problem. Doing this, you tend to exclude your own thoughts and feelings about the subject or object. Quantitative research usually happens in hard sciences like physics, chemistry, biology, and medicine; qualitative research, in soft sciences such as humanities, social sciences, education, and psychology, among others.
- 2. CLEARLY DEFINED RESEARCH QUESTIONS.** The researchers know in advance what they are looking for. The research questions are well-defined for which objective answers are sought. All aspects of the study are carefully designed before data are gathered.
- 3. STRUCTURED RESEARCH INSTRUMENTS.** Standardized instruments guide data collection, thus ensuring the accuracy, reliability and validity of data. Data are normally gathered using structured research tools such as questionnaires to collect measurable characteristics of the population like age, socio-economic status, number of children, among others.
- 4. NUMERICAL DATA.** Figures, tables or graphs showcase summarized data collection in order to show trends, relationships or differences among variables. In sum, the charts and tables allow you to see the evidence collected.
- 5. LARGE SAMPLE SIZES.** To arrive at a more reliable data analysis, a normal population distribution curve is preferred. This requires a large sample size, depending on how the characteristics of the population vary. Random sampling is recommended in determining the sample size to avoid researcher's bias in interpreting the results.
- 6. REPLICATION.** Quantitative methods can be repeated to verify findings in another setting, thus strengthening and reinforcing validity of findings eliminating the possibility of spurious conclusions.
- 7. FUTURE OUTCOMES.** By using complex mathematical calculations and with the aid of computers, if-then scenarios may be formulated thus predicting future results. Quantitative research puts emphasis on proof, rather than discovery.

STRENGTHS OF QUANTITATIVE RESEARCH

The advantages of quantitative research include the following:

1. It is **objective**. The most reliable and valid way of concluding results, giving way to a new hypothesis or to disproving it. Because of the bigger number of the sample of a population, the results or generalizations are more reliable and valid. Since it provides numerical data, it can't be easily misinterpreted.
2. The **use of statistical techniques** facilitates sophisticated analyses and allows you to comprehend a huge number of vital characteristics of data.
3. It is **real and unbiased**. If the research is properly designed it filters out external factors, and so can be seen as real and unbiased.
4. The **numerical data can be analyzed in a quick and easy way**. By employing statistically valid random models, findings can be generalized to the population about which information is necessary.
5. Quantitative studies are **replicable**. Standardized approaches allow the study to be replicated in different areas or over time with formulation of comparable findings.
6. Quantitative experiments are **useful for testing the results** gained by a series of **qualitative experiments**, leading to a final answer, and narrowing down of possible directions to follow.

WEAKNESSES OF QUANTITATIVE RESEARCH

The disadvantages of quantitative research are as follows:

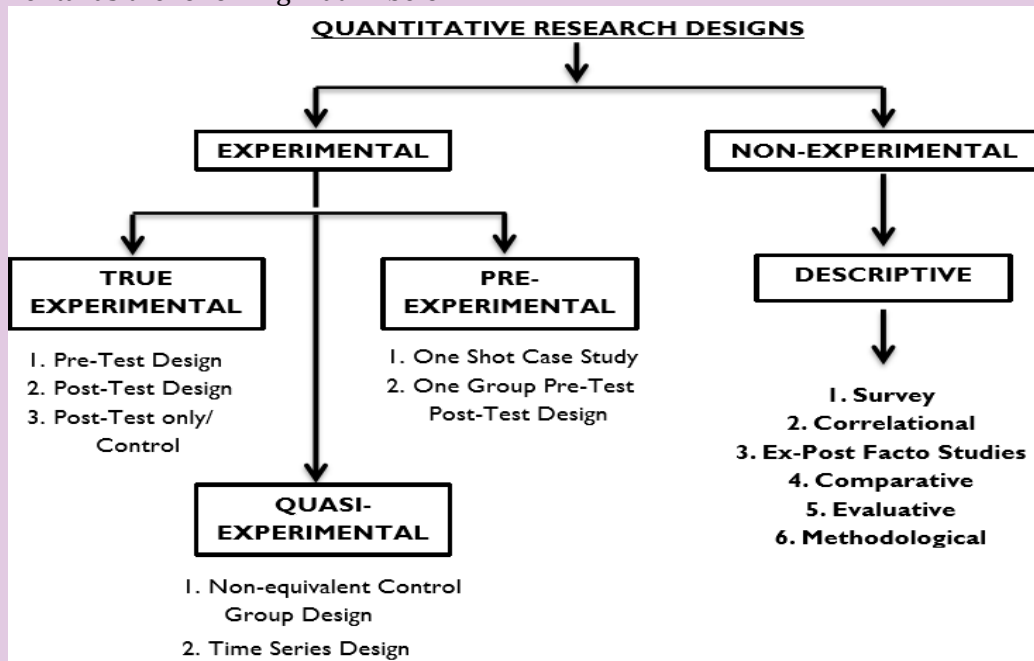
1. Quantitative research **requires a large number of respondents**. It is assumed that the larger the sample is, the more statistically accurate the findings are.
2. It is **costly**. Since, there are more respondents compared to qualitative research, the expenses will be greater in reaching out to these people and in reproducing questionnaires.
3. The information is contextual factors to help interpret the results or to explain variations are usually ignored. It **does not consider the distinct capacity of the respondents to share and elaborate further information** unlike qualitative research.

4. Much information are difficult to gather using structured research instruments, specifically on sensitive issues like pre-marital sex, domestic violence, among others.

5. If not done seriously and correctly, data from questionnaires may be incomplete and inaccurate. Researchers must be on the look-out for respondents who are just guessing in answering the instrument.

KINDS OF QUANTITATIVE RESEARCH DESIGNS

Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques. The kind of research is dependent on the researcher's aim in conducting the study and the extent to which the findings will be used. Quantitative research designs are generally classified into experimental and non-experimental as the following matrix below.



The following are the various kinds of quantitative research design that a researcher may employ:

1. EXPERIMENTAL RESEARCH DESIGN. This allows the researcher to control the situation. In doing so, it allows the researcher to answer the question, "What causes something to occur?" This kind of research also allows the researcher to identify cause and effect relationships between variables and to distinguish placebo effects from treatment effects. Further, this research design supports the ability to limit alternative explanations and to infer direct causal relationships in the study; the approach provides the highest degree level of evidence for single studies.

A. PRE-EXPERIMENTAL DESIGN. A type of research applies to experimental design that has the least internal validity. One type of pre-experiment, the simple group, pretest-post-test design, measures the group two times, before and after the intervention. Instead of comparing the pretest with the posttest within one group, the posttest of the treated group is compared with that of an untreated group. Measuring the effect as the difference between groups marks this as between-subjects design. Assuming both groups experienced the same time-related influences, the comparison group feature should protect this design from the rival explanations that threaten the within-subject design.

B. QUASI - EXPERIMENTAL DESIGN. In this design, the researcher can collect more data, either by scheduling more observations or finding more existing measures. Quasi-experimental design involves selecting groups, upon which a variable is tested, without any random pre-selection processes. For example, to perform an educational experiment, a class might be arbitrarily divided by alphabetical selection or by seating arrangement. The division is often convenient and, especially in an educational situation, causes as little disruption as possible. After this selection, the experiment proceeds in a very similar way to any other experiment, with a variable being compared between different groups, or over a period.

C. TRUE-EXPERIMENTAL DESIGN. It controls for both time-related and group related threats. Two features mark true experiments: two or more differently treated groups; and random assignment to these groups. These features require that the researchers have control over the experimental treatment and the power to place subjects in groups.

2. NON-EXPERIMENTAL DESIGN. In this kind of design, the researcher observes the phenomena as they occur naturally, and no external variables are introduced. In this research design, the variables are not deliberately manipulated nor is the setting controlled. Researchers collect data without making changes or introducing treatments. **This may also be called DESCRIPTIVE RESEARCH DESIGN** because it is only one under nonexperimental design.

DESCRIPTIVE RESEARCH DESIGN's main purpose is to observe, describe and document aspects of a situation as it naturally occurs and sometimes to serve as a starting point for hypothesis generation or theory development. The types of descriptive design are as follows:

A. SURVEY. It is used to gather information from groups of people by selecting and studying samples chosen from a population. This is useful when the objective of the study is to see general picture of the population under investigation in terms of their social and economic characteristics, opinions, and their knowledge about the behavior towards a certain phenomenon.

B. CORRELATIONAL. It is conducted by researchers whose aim would be to find out the direction, associations and/or relationship between different variables or groups of respondents under study. Correlational Research has three types, these are: a. Bivariate Correlational Studies – It obtains score from two variables for each subject, and then uses them to calculate a correlation coefficient. The term bivariate implies that the two variables are correlated (variables are selected because they are believed to be related). Example: Children of wealthier (variable one), better educated (variable 2) parents earn higher salaries as adults.

C. EX-POST FACTO or CAUSAL-COMPARATIVE. This kind of research derives conclusion from observations and manifestations that already occurred in the past and now compared to some dependent variables. It discusses why and how a phenomenon occurs. Example 1: A researcher is interested in how weight influences stress-coping level of adults. Here the subjects would be separated into different groups (underweight, normal, overweight) and their stress-coping levels measured. This is an ex post facto design because a pre-existing characteristic (weight) was used to form the groups. Example 2: What is the Effect of Home Schooling on the Social Skills of Adolescents?

D. COMPARATIVE. It involves comparing two or more samples of study subjects on one or more variables, often at a single point of time. Specifically, this design is used to compare two distinct groups based on selected attributes such as knowledge level, perceptions, and attitudes, physical or psychological symptoms. Example: A comparative Study on the Health Problems among Rural and Urban People in Ilocos Region, Philippines.

E. NORMATIVE. It describes the norm level of characteristics for a given behavior. For example: If you are conducting a research on the study habits of high school students you are to use the range of score to describe the level of their study habits. The same true is when you would want to describe their academic performance.

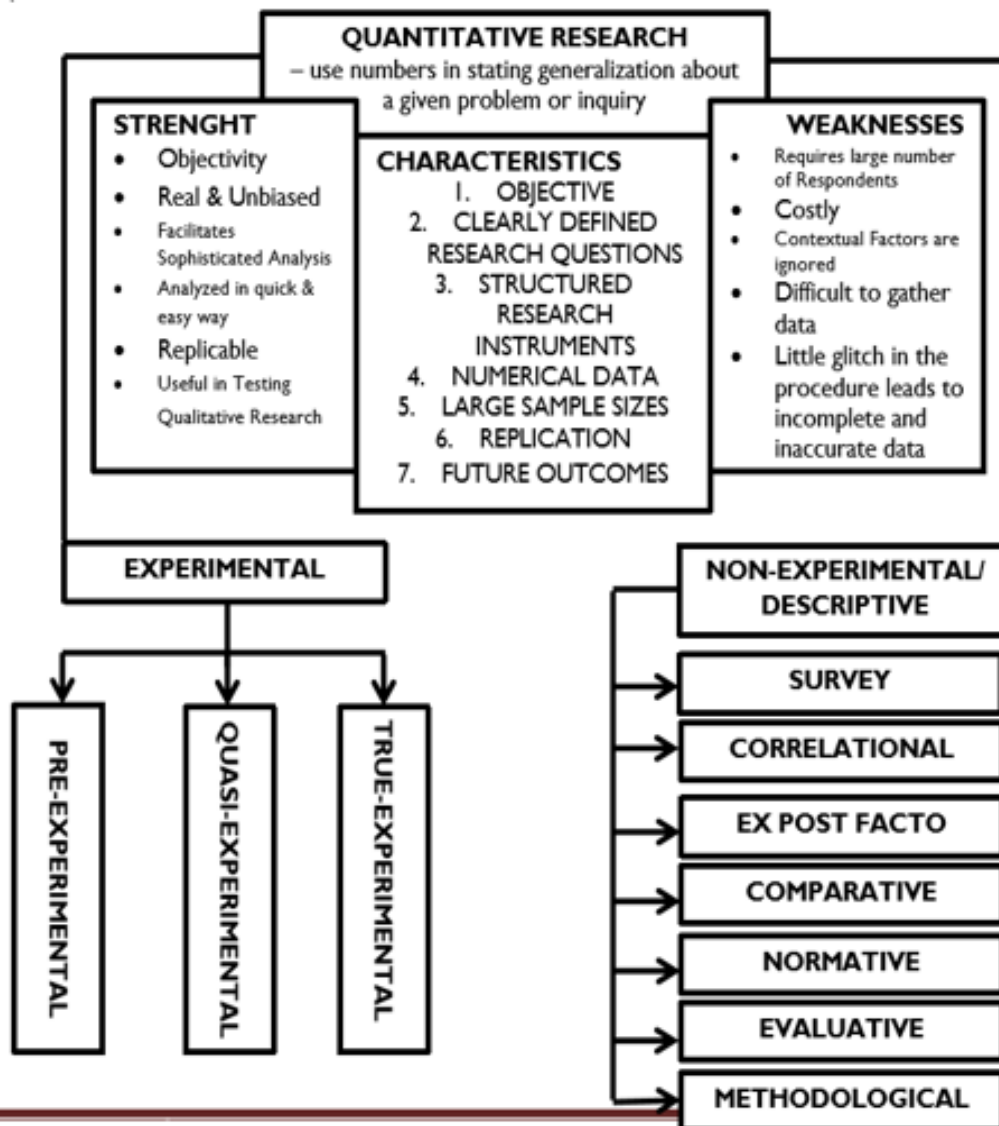
F. EVALUATIVE. It is a process used to determine what has happened during a given activity or in an institution. The purpose of evaluation is to see if a given program is working, an institution is successful according to the goals set for it, or if the original intent was successfully attained. In other words, in evaluation judgments can be in the forms of social utility, desirability, or effectiveness of a process. For example, we can cite here a situation. In evaluation study, it will not just be considering the performance of the students who were taught under modular instruction; instead, it is the rate of progress that happened among the students who were exposed to modular instruction. Example: A test of children in school is used to assess the effectiveness of teaching or the deployment of a curriculum.

G. METHODOLOGICAL. In this approach, the implementation of a variety of methodologies forms a critical part of achieving the goal of developing a scale matched approach, where data from different disciplines can be integrated.

LESSON 1 - SUMMARY



KEEP THIS IN MIND.



POWERLINK: https://www.youtube.com/watch?v=69qP8kFjp_k
<https://www.youtube.com/watch?v=a-XtVF7Bofg>

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