Practical Research 2

Quarter 1 - Module 1
Nature of Inquiry and Research

OVERVIEW

In lesson 1, the different kinds of quantitative research are identified with their corresponding characteristics, strengths, and weaknesses. With this, learners are expected to distinguish each classification of quantitative research.

Upon completing this module, you will have a deeper understanding of the Practical Research 2 subject that will equip you with the knowledge and skill to decide on a suitable quantitative research project applicable to your area of interest.

OBJECTIVES

At the end of this module, you should be able to:

1. Describe the characteristics, strengths, weaknesses, and kinds of quantitative research **(CS_RS12-Ia-c-1);**
2. Illustrate the importance of quantitative research across field **(CS_RS12-Ia-c-2);**
3. Differentiate the kinds of variables and their uses **(CS_RS12-Ia-c-3);**

Instructions

1. Write all your work in your Activity notebook**. Be sure to label your work by the module number and title**. You may use your old notebook.
2. Read each section carefully. If you have not read the first two sections, go over them first.
3. Each module begins with a brief introduction or **Overview** followed by a list of **Objectives** you are expected to learn.
4. Before working on the activities, answer the **Pretest** first. Find out how well you did by checking your answer against the answers given under the **Self-Check** of the pretest.
5. As you work on the activities, try to relate them to the objectives of this module. What skill or strategy does the activity develop?
6. After working on all the activities take the **Posttest**

PRE ASSESSMENT

Directions: Read and analyze the statements below. Encircle the letter of the correct answer.

1. Which of the following statements is NOT a characteristic of quantitative research?
   A. The results taken from a sample can be generalized to the population.
   B. It delivers an in-depth understanding of the problem or study.
   C. It provides a more credible and reliable result.
   D. Statistical analysis of numerical data.

2. In an experiment, which group does not receive intervention?
   A. The treatment group
   B. The participant group
   C. The control group
   D. The experimental group

3. Which of the following research questions could be answered by using quantitative research methods?
   A. What is the most popular social media platform used by Senior High School students?
   B. How has the Covid-19 pandemic affect career choices among college students?
   C. What are the factors affecting depressive behavior?
   D. None of the above.

4. Which statement below illustrates a weakness of quantitative research?
   A. The responses of the participants are limited to what has been asked and the choices given.
   B. The researcher's perspective can influence interpretation of results.
   C. Data gathering takes too much time.
   D. Low degree of subjectivity

5. Which of the following is **NOT** a strength of quantitative research?
   A. Speedy data analysis
   B. Less expensive
   C. Replicable
   D. Objective

For items 6 and 7, identify whether the given research topic is:
   A. Correlational
   B. Quasi- experimental
   C. Descriptive
   D. Experimental

6. Determination of the degree of satisfaction of parents, teachers, and students on the online and modular blended learning.

7. The effects of non-renewal of the ABS-CBN franchise to the average television viewing time of housewives.

8. Which type of quantitative research seeks to determine relationship of one characteristic to the other characteristic?
   A. Correlational
   B. Experimental
   C. Ex-post facto
   D. Descriptive

9. Which of the following statements is NOT true about the importance of Quantitative Research?

A. helps educators identify ways to improve learning.
B. helps improve crop production using safe organic fertilizers.
C. helps pharmaceutical companies explore safe and effective medicines.
D. helps understand victims of domestic violence perception of satisfaction.

For items 10 to 12, determine if the statement is:

A. Always true C. Never true
B. Sometimes true D. Cannot be identified

10. A nominal variable is expressed in numbers.

11. The independent and dependent variables are applicable to ALL quantitative studies.

12. Dependent variables can be manipulated.

13. A group of students would like to know if spending time with a cat or dog decreases the amount of stress and allows students to perform better on tests. Which of the following is an extraneous variable?
    A. Student's feeling towards the cat or dog
    B. Amount of time spent with a cat or dog
    C. Test scores of students
    D. Amount of stress

14. A famous vlogger wanted to know if changing the content of his vlogs (food review, travel, study tips, etc.) will affect the number of views per uploaded video. The number of views per uploaded video is the:
    A. Confounding variable
    B. Independent variable
    C. Dependent variable
    D. Continuous variable

15. Which of the following is an example of a continuous variable?
    A. Learning modality used
    B. Student's test score
    C. Student's height
    D. Student's IQ

Self-check 

Here are the answers to the questions. Did you get them all right? Check your answers and find out how you fared.

1. B	4. A	7. A	10. B	13. A
2. C	5. B	8. A	11. C	14. C
3. A	6. C	9. D	12. B	15. C

Perfect score is 15. Did you get a perfect score? That's great! Congratulations! Nevertheless, study the module well so as to improve your skills.

If you scored between 11 to 14, very good! Keep it up. You will find the module very helpful in enhancing your skills.

If you scored between 7 to 10, you did just fine. Work on the module well and read more and more so you will do better.

If you scored 6 or lower that's alright. Read, read and read. Study the module thoroughly and do all the activities well to improve your score. Good luck.

Lesson 1 Introduction to Quantitative 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; 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.

Vital to the conduct of a quantitative research project is a deep understanding of its characteristics. When you know its strengths and different classifications, you will be able to identify what kind of questions you should ask and what approach is most suited to find answers to these questions. The identification of its weaknesses on the other hand, aids in recognizing the questions or topics that are inappropriate to this course. At the end of this lesson, you will have a good grasp of what is quantitative research that will prepare you in crafting a good research study and instrumental to building lifelong skills.

Activity 1: Finding clues

Directions**:** Group the following word clues if they are characteristics of Quantitative Research (Box A) or Qualitative Research (Box B).

1. Measurable
2. Behavior
3. Statistical
4. Narrative
5. Objective
6. Text-based
7. Intervention
8. Experimental group
9. Unstructured observation
10. Inductive
11. Subjective
12. Small sample
13. Tables and charts
14. Deductive
15. Generalizable

A. Quantitative Research	B. Qualitative Research

Activity 2: Let's match

Directions: Match the following quantitative research title under column A to its classification (research design) in column B. Write the letter of the correct answer on the space provided.

Column A	Column B
_____1. Investigating the effects of formalin treated eggplants on mice.	**A.** Experimental
_____2. Factors affecting job satisfaction among Tech-Voc graduates.	**B.** Descriptive
_____3. Prevalence of domestic violence in cities declared under Enhanced Community Quarantine during the Covid-19 pandemic.	**C.** Ex post facto
_____4. The effects of age on social media platform choice.	**D.** Quasi-experimental
_____5. The relationship between intelligence and sports choices among high school students.	**E.** Correlational
	F. Case Study

Quantitative Research

You have learned from Practical Research 1 that research method is classified into two main types: quantitative and qualitative. While both methods utilize a specific data gathering procedure, the former is generally concerned with understanding phenomenon relating to or involving quality or kind. The latter, on the other hand, is based on the measurement or quantity. In this module, we will focus on quantitative methods of research and what are its different kinds.

Quantitative research uses scientifically collected and statistically analyzed data to investigate observable phenomena. A phenomenon is any existing or observable fact or situation that we want to unearth further or understand. It is scientific for the fact that it uses a scientific method in designing and collecting numerical data. Once data is collected, it will undergo statistical analysis like Pearson's r, t-test and Analysis of Variance (ANOVA) for analysis. Since data is analyzed statistically, it is imperative that the data obtained must be numerical and quantifiable, hence its name quantitative research.

Numerical data are generally easier to collect than descriptions or phrases used in qualitative research. Information like student's grades in different subjects, number of hours of engagement in social media platforms of teens, percentage of consumers who prefer the color blue for soap packaging, average daily Covid-19 patient recovery per region are just few examples of research data expressed in numbers. Some data on the other hand, are not directly countable and thus require conversion from non-numerical information into numerical information. For instance, determining which brand of canned sardines is the best choice for

consumers in terms of taste cannot be expressed in numbers unless we do a survey using a rating scale. Several forms of rating scales are available, e.g., the Likert scale that we can use to quantify data. Usually, they come in a selection of numbers with a corresponding meaning for each choice, for example: 1= tastes very good, 2 = satisfactory, or 3 = undesirable. Numerical choices convert texts into numbers so the researcher can perform mathematical operations for faster, more accurate, and more objective analysis.

Characteristics of Quantitative Research

Quantitative research is commonly used in natural sciences research problems because of the following characteristics:

1. **LARGE SAMPLE SIZE**. To obtain more meaningful statistical result, the data must come from a large sample size.

2. **OBJECTIVE**. Data gathering and analysis of results are done accurately, objectively, and are unaffected by the researcher's intuition and personal guesses.

3. **VISUAL RESULT PRESENTATION**. Data is numerical, which makes presentation through graphs, charts, and tables possible and for better conveyance and interpretation.

4. **FASTER DATA ANALYSIS**. The use of a statistical tools give way for a less time-consuming data analysis.

5. **GENERALIZED DATA**. Data taken from a sample can be applied to the population if sampling is done accordingly, i.e., sufficient size and random samples were taken.

6. **FAST DATA COLLECTION**. Depending on the type of data needed, collection can be quick and easy. Quantitative research uses standardized research instruments that allow the researcher to collect data from a large sample size efficiently. For instance, a single survey form can be administered simultaneously to collect various measurable characteristics like age, gender, socio-economic status, etc.

7. **RELIABLE DATA**. Data is taken and analyzed objectively from a sample as a representative of the population, making it more credible and reliable for policymaking and decision making.

8. **REPLICATION**. The Quantitative method can be repeated to verify findings enhancing its validity, free from false or immature conclusions.

Strengths of Quantitative Research

The following are the strengths of quantitative research.

1. Quantitative research can be replicated or repeated.
2. Findings are generalizable to the population.
3. Conclusive establishment of cause and effect
4. Numerical and quantifiable data can be used to predict outcomes
5. Fast and easy data analysis using statistical software.
6. Fast and easy data gathering
7. Very objective
8. Validity and reliability can be established

Weaknesses of Quantitative Research

The following are the disadvantages of quantitative research:

1. It lacks the necessary data to explore a problem or concept in depth.
2. It does not provide comprehensive explanation of human experiences.
3. Some information cannot be described by numerical data such as feelings, and beliefs.
4. The research design is rigid and not very flexible.
5. The participants are limited to choose only from the given responses.
6. The respondents may tend to provide inaccurate responses.
7. A Large sample size makes data collection more costly.

Kinds of Quantitative Research

Quantitative research is a broad spectrum that it can be classified into smaller and more specific kinds: descriptive, correlational, *ex post facto*, quasi-experimental, and experimental.

Descriptive design is used to describe a particular phenomenon by observing it as it occurs in nature. There is no experimental manipulation and the researcher does not start with a hypothesis. The goal of descriptive research is only to describe the person or object of the study. An example of descriptive research design is “the determination of the different kinds of physical activities and how often high school students do it during the quarantine period.”

The correlational design identifies the relationship between variables. Data is collected by observation since it does not consider the cause and effect for example, the relationship between the amount of physical activity done and student academic achievement.

***Ex post facto* design** is used to investigate a possible relationship between previous events and present conditions. The term “*Ex post facto*”, means after the fact, looks at the possible causes of an already occurring phenomenon. Just like the first two, there is no experimental manipulation in this design. An example of this is “how does the parent’s academic achievement affect the children obesity?”

A quasi-experimental design is used to establish the cause and effect relationship of variables. Although it resembles the experimental design, the quasi-experimental has lesser validity due to the absence of random selection and assignment of subjects. Here, the independent variable is identified but not manipulated. The researcher does not modify pre-existing groups of subjects. The group exposed to treatment (experimental) is compared to the group unexposed to treatment (control): example, the effects of unemployment on attitude towards following safety protocol in ECQ declared areas.

Experimental design like quasi- experimental is used to establish the cause and effect relationship of two or more variables. This design provides a more conclusive result because it uses random assignment of subjects and experimental manipulations. For example, a comparison of the effects of various blended learning to the reading comprehension of elementary pupils.

Activity 1: True or False

Directions: On the space provided, write **TRUE** if the statement describes quantitative research and **FALSE** if it is incorrect.

_____1. Quantitative data can be presented using tables and graphs.
_____2. The results of quantitative research can be used to generalize and predict.
_____3. Quantitative research is flexible so at any stage, the study may change.
_____4. Quantitative data are more credible, reliable, and useful than qualitative data.
_____5. The research study cannot be replicated or repeated because it is unique in every case.
_____6. Data are in the form of numbers and analyzed statistically.
_____7. Data analysis is an on-going process. It can be done at any stage of the process.
_____8. The behavior of the participants is observed and is critical to the analysis of results.
_____9. Analysis of data is less time-consuming.
_____10. In quantitative research, the researcher participates and engages the participants in the study

Activity 2: Yes or No

Direction**:** Write **YES** on the blank if the question requires for quantitative approach and **NO** if it does not.

_____1. Are high grades in Mathematics a good indicator for employment after graduation?
_____2. Will taking brain enhancers increase examination scores?
_____3. Are there changes in consumer behavior before and after online selling was popularized?
_____4. Do online learning materials enhance the computer skills of students?
_____5. Are there changes in the study habits of public school students before and after the Covid-19 pandemic?
_____6. What kind of pick-up lines are most appealing to both genders at the early adult stage?
_____7. Is there a difference in the academic performance of students using online, blended and modular learning modalities?
_____8. Will student's and parent's attitudes towards distance learning change over time?
_____9. Which of the four SHS tracks (Academic, Tech-Voc, Sports, Arts & Design) is greatly affected by the Covid-19 pandemic?
_____10. What are the factors affecting the delayed completion and submission of assignments/tasks given to students using modular learning modality?

Directions: Write your learning about the following:

1. What is quantitative research?
   _____
   _____
   _____

2. What are the characteristics of quantitative research?
   _____
   _____
   _____

3. Discuss the strengths of quantitative research.
   _____
   _____
   _____

4. Discuss the weaknesses of quantitative research.
   _____
   _____

_____

5. Describe each type of quantitative design and give one (1) example for each kind.
   A. Descriptive design. _____
      _____
      _____
      _____

   B. Correlational design. _____
      _____
      _____
      _____

   C. *Ex post facto design*. _____
      _____
      _____
      _____

   D. Quasi-experimental design. _____
      _____
      _____

   E. Experimental design. _____
      _____
      _____
      _____

References

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