



SHS Practical Research 2 Alternative Delivery Mode Quarter 2 – Module 1: Understanding Data and Ways to Systematically Collect Data First Edition, 2020

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Practical Research 2

Quarter 2 - Module 1 Understanding Data and Ways to Systematically Collect Data



Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-bystep as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What This Module is About

When you aim to arrive to a certain solution of a problem, the journey is smooth and focused when the direction is clear. The research methodology of your study is very important since it gives direction to systematically arrive to answers or solution to your chosen research problem. It contains rules and procedures that you as a researcher will have to follow.

This module focuses on the discussion of your research design and plan, population to consider, sampling technique, research instruments, and appropriate statistical treatments to be employed. At end of this learning module learners are expected to understand the concept of research data and know the ways to systematically collect data.

The following are the lessons contained in this module:

Lesson 1 – Quantitative Research Design Lesson 2 – Sampling Procedure and Sample Lesson 3 – Research Instruments, Validity, Reliability Lesson 4 – Research Intervention Lesson 5 – Data Collection Procedure Lesson 6 – Data Analysis Lesson 7 – Presenting Research Methodology



What I Need to Know

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

- 1. choose appropriate quantitative research design (CS_RS12-IIa-c-1);
- 2. describe sampling procedure and the sample (CS_RS12-lla-c-1);
- construct an instrument and establishes its validity and reliability (CS_RS12-IIa-c-3);
- 4. describe intervention (if applicable) (CS_RS12-IIa-c-4);
- 5. plan data collection procedure (CS_RS12-IIa-c-5)
- 6. plan data analysis using statistics and hypothesis testing (if appropriate) (CS_RS12-IIa-c-6); and
- 7. present written research methodology (CS_RS12-IIa-c-7);



What I Know

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

- 1. What research design aims to determine a cause from already existing effects?
 - A. Descriptive Research Design
- C. Quasi-Experimental Research
- B. Correlational Research Design
- D. Ex Post Facto
- 2. What research design is often conducted in a controlled setting with corresponding research treatment?
 - A. Correlational B. Ex post facto

- C. Survey Research
- D. Experimental
- 3. What is the suited research design for this research title, "The Effects of Twitter on the Communication Etiquette of Students"?
 - A. Correlational
 - B. Ex post facto

- C. Experimental
- D. Descriptive
- 4. Mr. Canuc would like to know further the type of social media used between the male and female SHS students of East Pagat National High School. What is the appropriate research design to be used in his study?
 - A. Quasi-Experimental

C. Experimental

B. Correlational

- D. Descriptive
- 5. What is the difference between quasi-experimental research and experimental research?
 - A. Only one dependent variable is used in quasi-experimental research, while multiple dependent variables can be used in quasi-experimental research.
 - B. Intact groups are used in experimental, while quasi-experimental randomly assigned individuals into groups.
 - C. The researcher controls the intervention in the experimental group, but not quasiexperimental research.
 - D. Participants for groups are randomly selected in experimental, but not quasiexperimental research.
- 6. What sampling technique is used when the researcher would like to consider giving an equal chance to the member of the accessible population being selected as part of the studv?
 - A. Simple Random Sampling
- C. Systematic Sampling

B. Stratified Sampling

- D. Cluster Sampling
- 7. When can we consider a research sample as the "best"?
 - A. representative of the populationC. conveniently representedB. systematically chosenD. purposely selected

- 8. What is the main objective of using stratified random sampling?
 - A. sample was chosen proportionately drawn from the different categories of the population
 - B. sample is taken from an accessible population than the target population
 - C. every individual will be given an equal chance to be selected
 - D. those who will possibly respond to treatment are chosen

9. What is the sampling method used in the given situation?

Teacher Joan wants to know if the new learning modalities of the school effects on the academic performance of students in the science curriculum. He took the list of students and selected every 8th name in each class list as participant.

A. Stratified Random Sampling

C. Systematic Random Sampling

- B. Simple Random Sampling
- **D.** Cluster Sampling
- 10. What is the type of validity when an instrument produces results similar to those of another instrument that will be employed in the future?
 - A. Predictive Validity

- C. Content Validity D. Face Validity
- B. Criterion Validity
- 11. What is the type of reliability when measured by administering two tests identical in all aspects except the actual wording of items?
 - A. Internal Consistency Reliability
 - B. Test-retest reliability
- C. Equivalent Forms Reliability
- D. Inter-rater Reliability
- 12. The Ability Test has been proven to predict the writing skills of Senior High School students. What type of test validity is shown in the example?
 - A. Construct Validity
 - **B.** Criterion Validity
- C. Content Validity
- D. Face Validity
- 13. What common scaling technique consists of several declarative statements that express viewpoint on a topic?

A. Semantic Differential Scale	C. Observation Checklist
B. Completion Type	D. Likert Scale

- 14. What statistical technique purposes to test the relationship between two continuous variables?
 - A. T-Test for two dependent samples
 - B. T-Test for independent samples
- C. Chi Square Test
- D. Pearson's r
- 15. What statistical technique should be used for this research question, "Is there a significant difference between the pretest and posttest scores of learners in reading comprehension test?"
 - A. T-Test for two dependent samples
- C. Chi Square Test
- B. T-Test for independent samples
- D. Pearson's r



Quantitative Research Designs



What's In

Quantitative research is more systematic and controlled than qualitative. However, both research methods have a statement of the problem to investigate. At this point, it is assumed that you are already done stating your research problem, the background of the study, scope and delimitation, hypothesis, conceptual framework, and review of related literature and studies.

Each type of research has a unique design to follow that will also lead the direction of sampling procedure, data gathering, and data analysis. Each research type also aims to answer specific research questions; how it will be answered is determined by its design.

Important considerations also are the variables of the study. The type of variables provides paradigm (your conceptual framework), which helps the researcher decide on what will be the design of the study.

So, it is very important that you have completed the previous tasks diligently to maximize your learning in this Module. In this lesson, you will be taught how to select an appropriate quantitative research design.



What I Need to Know

Meaning of Quantitative Research Designs

When a man decides to build a house, does not he draw first the blueprint before he will start to do the work? Same with the conduct of research, the blueprint for the collection, measurement, and data analysis is drawn as a pattern to follow. Furthermore, research designs enable the researcher to obtain a more valid, objective, reliable, and accurate answers to the research questions.

Research design is defined as the rational and coherent overall strategy that the researcher uses to incorporate all the vital components of the research study. Hence, in order to find meaning in the overall process of doing your research study, a step-by-step process will be helpful to you.

In quantitative research, you are going to have a great deal of abstraction and numerical analysis. According to Fraenkel and Wallen (2007, p 15), the research designs in quantitative research are mostly pre-established. Hence having an appropriate research design in quantitative research, the researcher will have a clearer comprehension of what he is trying to analyze and interpret.



Activity 1: Plan Your Work

Directions: Pretend that you are conducting a study on academic adjustments of teachers and students on the learning delivery modes during this time of COVID–19 pandemic. Come up with a plan on how you are going to obtain the necessary data for this study. Draw a procedural flowchart to illustrate your plan.

Study on Academic Adjustments of Teachers and Students on the Learning Delivery Modes during COVID – 19 Pandemic

"Plan of Work Flowchart"



Types of Quantitative Research Design

Quantitative Research Designs have five general classifications: descriptive, correlational, ex post facto, quasi-experimental, and experimental.

Descriptive Research. When little is known about the research problem, then it is appropriate to use descriptive research design. It is a design that is exploratory in nature. The purpose of descriptive research is basically to answer questions such as who, what, where, when, and how much. So, this design is best used when the main objective of the study is just to observe and report a certain phenomenon as it is happening.

Correlational Research. The main goal of this design is to determine if variable increases or decreases as another variable increases or decreases. This design seeks to establish an association between variables. It does not seek cause and effect relationship like descriptive research; it measures variables as it occurs. It has two major purposes: (a) to clarify the relationship between variables and (b) predict the magnitude of the association. However, the extent of the purpose of correlational research depends on the scope and delimitation of the study.

Ex Post Facto. If the objective of the study is to measure a cause from a pre-existing effect, then Ex Post Facto research design is more appropriate to use. In this design, the researcher has no control over the variables in the research study. Thus, one cannot conclude that the changes measured happen during the actual conduct of the study.

The last two types of quantitative research designs are identifiable for the existence of treatment or intervention applied to the current research study. **Intervention or treatment** pertains to controlling or manipulating the independent variable in an experiment. It is assumed that the changes in dependent variables were caused by the independent variable.

There are also two groups of subjects, participants, or respondents in quasiexperimental and experimental research. The **treatment group** refers to the group subjected to treatment or intervention. The group not subject to treatment or intervention is called **the control group**.

Quasi-Experimental. The term means partly, partially, or almost – pronounced as *kwahz-eye*. This research design aims to measure the causal relationship between variables. The effect measured is considered to have occurred during the conduct of the current study. The partiality of quasi-experimental design comes from assigning subjects, participants, or respondents into their groups. The groups are known to be already established before the study, such as age educational background and nationality. Since the assignment of subjects, participants, or respondents are not randomly assigned into an experimental or control groups, the conclusion of results is limited.

Experimental Research. This research design is based on the scientific method called experiment with a procedure of gathering data under a controlled or manipulated environment. It is also known as true experimental design since it applies treatment and manipulation more extensively compared to quasi-experimental design. Random assignment of subjects or participants into treatment and control group is done increasing the validity of the study. Experimental research, therefore, attempts to affect a certain variable by directly manipulating the independent variable.



Activity 2. Quantitative Research Designs Summary

Directions: Using the template below, summarize the five quantitative research designs according to its goal, and its corresponding variable manipulation.

Research Design	Goal	How variable is handled or manipulated
1. Descriptive		
2. Correlational		
3. Ex post facto		
4. Quasi- experimental		
5. Experimental		

Activity 3. Choose the Appropriate Research Design

- Directions: Determine the quantitative research design appropriate for the sample research titles. Make sure to explain your choice into two to three sentences.
 - 1. Relationship between Academic Stressors and Learning Preferences of Senior High School Students

Quantitative Research Design: _____

Explanation:

2. Reading Electronic Learning Materials as a Support for Vocabulary of Grade 1 Pupils

3. Impact of the Implementation of COVID – 19 Health Protocols in Supermarkets on Consumer Behaviors

	Quantitative Research Design:
	Explanation:
4.	Effects of Morning Exercise on the Health Anxiety Level of Senior Citizens
	Quantitative Research Design:
	Explanation:
5.	Measuring the Gadgets Usage of Children at Home during COVID-19 Community Quarantine
	Quantitative Research Design:
	Explanation:
6.	Level of Academic Achievement of Senior High Schools in Different Learning Modalities
	Quantitative Research Design:
	Explanation:

7. Effects of Story Telling on Quality of Sleep of Children

Quantitative Research Design:	
Explanation:	

Activity 4: Let's go Online

Go to the link below and practice what you've learned from this lesson:

https://bit.ly/36A5idj https://bit.ly/2LZVLCS https://bit.ly/3eojlWk https://bit.ly/2X2kxbX



Directions: As you have learned from this lesson, answer each question comprehensively.

1. This time, I have learned that quantitative research design....

2. How do you know the specific quantitative research design applied in a research study?



What I Can Do

Choose your Appropriate Research Design

Directions: Perform the following task. From what you have learned in this lesson, what is the appropriate research design for your current research problem? Justify your choice.

Research Design:

Justification:



Additional Activity

Direction: After you submit your research design, once it is corrected in accordance with the guidelines given, you may start incorporating it into your research manuscript.



Sampling Procedure and the Sample



Remember when you were taught how to write your scope and delimitation, you stated the subjects, participants, or respondents of your study. You also described their characteristics which qualify them to be the source of your research data.

The next question you must answer is, how many of the subjects, participants, or respondents should be selected as a source of data? This lesson will teach you how to describe sampling procedures in quantitative research. Note that the sampling procedure should be aligned to your chosen research design. Since you have already decided the research design of your study, then you are ready for this lesson.



What I Need to Know

Population and Sample

The first step in determining the sample size is identifying the population of the topic of interest. The **population** is the totality of all the objects, elements, persons, and characteristics under consideration. It is understood that this population possesses common characteristics about which the research aims to explore.

There are two types of population: target population and accessible population. The actual population is the **target population**, for example, all Senior High School Students enrolled in Science, Technology, Engineering, and Mathematics (STEM) in the Division of Cagayan de Oro City. While the accessible population is the portion of the population in which the researcher has reasonable access, for example all Senior High School enrolled, STEM strand at Marayon Science High School – X.

When the whole population is too costly or time-consuming or impractical to consider, then, a sample representative is identified. **Sampling** pertains to the systematic process of selecting the group to be analyzed in the research study. The goal is to get information from a group that represents the target population. Once a good sample is obtained, the generalizability and applicability of findings increases.

The representative subset of the population refers to the **sample**. All the 240 Senior High School Students enrolled in Science, Technology, Engineering, and Mathematics (STEM) Strand in a school, for example, constitute the population; 60 of those students constitute the sample. A good sample should have characteristics of the represented population – characteristics that are within the scope of the study with fair accuracy. Generally, the larger the sample, the more reliable the sample be, but still, it will depend on the scope and delimitation and research design of the study.



What's New

You are almost finished cooking the favorite meal of the family. In order to check if it tastes good and ready for serving, what will you do?

Answer:

 l will	
 	,





Approaches in Identifying the Sample Size

Heuristics. This approach refers to the general rule or rule of the thumb for sample size. This is the earliest established approach for sample sizes for different research designs.

Research Design	Suggested Number of Subjects/Participants
Descriptive Research	10% to 20% maybe
	required
Comparative Research	15 subjects or groups
Survey	800
Correlational	100 to 200
Ex post facto	30+
Experimental	30 or more

Literature Review. Another approach is by reading similar or related literature and studies to your current research study. Since you are done writing your review of related literature and studies, you might want to recall how these studies determine sample size. Using this approach increases the validity of your sampling procedure.

Formulas. Formulas are also being established for the computation of an acceptable sample size. You can use different formulas depending on what you know and do not know about the population. These tools are also available online. One formula for determining sample size that you can follow is the Cochran especially if you have large sample size.

Cochran's Formula:

$$n_o = \frac{Z^2 p q}{e^2}$$

where: e is the desired level of precision (margin of error)

p is the (estimated) proportion of the population which has the attribute in question q is 1 - p

Z is the z-value found in the Z table

For example, your study is for your city, and you want to determine how many households whose breadwinner work onsite during COVID pandemic. And you do not have enough information about the population. In that case, you are going to assume that a half of the breadwinners in the city are working onsite. So, this assumption will give you a maximum variability, so, p = 0.5. And you want 95% confidence, and at least 5 percent – plus or minus – precision; and that gives you Z values 1.96. As shown below, your sample size will be 384.

$$n_o = \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2}$$
$$= 384.16$$

Power Analysis. This approach is founded on the principle of power analysis. There are two principles you need to consider if you are going to use this approach: these are statistical power and effect size.

The probability of rejecting the null hypothesis is called **statistical power**. It suggests that indeed there is a relationship between the independent and dependent variables of the research study. The ideal statistical power of a research study is 80%. With the statistical power, it will be used to identify the sufficient sample size for measuring the effect size of a certain treatment. The level of difference between the experimental group and the control group refers to **effect size**.

If the statistical power tells that relationship between independent and dependent variables, the effect size suggests the extent of the relationship between these two variables. Henceforth, the higher the effect size, means the greater the level difference between the experimental and control groups. For example, your research study reveals that there is a difference in the pretest and posttest scores of the students in the given anxiety test after implementing a psychosocial intervention. With the effect size, you will have an idea of how small or large the difference is.



Probability Sampling in Quantitative Research

Simple Random Sampling. It is a way of choosing individuals in which all members of the accessible population are given an equal chance to be selected. There are various ways of obtaining samples through simple random sampling. These are fishbowl technique, roulette wheel, or use of the table of random numbers. This technique is also readily available online. Visit this link <u>https://www.randomizer.org/</u> to practice.

Stratified Random Sampling. The same with simple random sampling, stratified random sampling also gives an equal chance to all members of the population to be chosen.

However, the population is first divided into strata or groups before selecting the samples. The samples are chosen from these subgroups and not directly from the entire population. This procedure is best used when the variables of the study are also grouped into classes such as gender and grade level.

You can simply follow the steps from this given example:

A population of 600 Junior High School students includes 180 Grade 7, 160 Grade 8, 150 Grade 9, and 110 Grade 10. If the computed sample size is 240, the following proportionate sampling will be as follows.

The number of members per subgroup is divided by the total accessible sample size. The percentage result of members per subgroup will be multiplied from the computed total sample size. After obtaining the sample size per strata, then simple random sampling will be done for the selection of samples from each group.

				Sample Size per Subgroups
180/600	=	.30x 240	=	72 Grade 7 students
160/600	=	.27x 240	=	65 Grade 8 students
150/600	=	.25x 240	=	60 Grade 9 students
110/600	=	.18x 240	=	43 Grade 10 students
		100%		240 respondents

Cluster Sampling. This procedure is usually applied in large-scale studies, geographical spread out of the population is a challenge, and gathering information will be very time-consuming. Similar to stratified random sampling, cluster sampling also involves grouping of the population according to subgroups or clusters. It is a method where multiple clusters of people from the chosen population will be created by the researcher in order to have homogenous characteristics.

For example, a researcher would like to interview of all public senior high school students across Mindanao. As a researcher cluster will be selected to satisfy the plan size. In the given example, the first cluster can be by region, the second cluster can be by division, and the third cluster can be by district.

Another way of doing cluster sampling is illustrated on the figure on the right side.



Systematic Sampling. This procedure is as simple as selecting samples every *n*th (example every 2^{nd} , 5^{th}) of the chosen population until arriving at a desired total number of sample size. Therefore, the selection is based on a predetermined interval. Dividing the population size by the sample size, the interval will be obtained. For example, from a total population of 75, you have 25 samples; using systematic sampling, you will decide to select every 3^{rd} person on the list of individuals.



What's More

Activity 1. Determine the Sampling Procedure

Directions: Identify the sampling procedure used in each given situation. Write your answer on the space provided and then explain your choice.

	Sample Situation	Sampling Procedure	Justification
2.	Alex's target population for his study are the employees of hotels in Mindanao. Since there are too many employees in these establishments, he randomly selected ten hotels based on hotel size. And then he randomly selected employees as participants in his study. Dianne wants to know if the new learning modalities in the first semester affects the academic performance of senior high students. He took all the lists of all students in her school and selected every 6 th name to be part of her study.		
3.	Faye wants to survey all the parents in Cagayan de Oro who opt to enroll their elementary children to an online class. All in all, there 26,000 parents. Faye decided to have 380 from the target population.		

Activity 2. Search the design and sampling procedure.

Directions: Search on the internet for a sample research study. Identify the research design used and its sampling procedure.

	Example 1	Example 2	Example 3
 Title of the Research Study 			
 Research Design 			
 Characteristics of Population 			
 Sampling Procedure 			
 Sample Size 			
 Source 			

Activity 3. Let's go online.

Practice what you have learned from this lesson. Visit the following links:

https://bit.ly/3em5Rdv https://bit.ly/2TF09LO



Directions: As you have learned from this lesson, answer each question comprehensively.

1. What do I know about the population and sample of the study?

2. I have learned that when determining the sample size of the study...

3. Now I know that sampling procedures involve...



What I Can Do

Describes your Sampling Procedure and Sample

Directions: Perform the following task. Identify the size of the population and sample for your study and explain the sampling method that you will use.

1. Size of Population	
2. The method used to determine sample size (include computation if applicable)	
3. Sample Size for the Study	
4. Sampling Procedure to be employed (explain the steps)	
5. Who will be your respondents?	



Direction: After you submit, you have described your sampling procedure and sample; once it is corrected in accordance with the guidelines given, you may start writing a paragraph format of this and incorporate it in your research manuscript.



Research Instrument, Validity and Reliability



What I Need to Know

Quantitative Research Instrument

What do you think will happen if tools for building a house is not prepared meticulously? The same thing when getting information for answers to a research problem, tools, or instruments should be prepared carefully. In constructing a quantitative research instrument, it is very important to remember that the tools created should require responses or data that will be numerically analyzed.

Research Instruments are basic tools researchers used to gather data for specific research problems. Common instruments are **performance tests**, **questionnaires**, **interviews**, and **observation checklist**. The first two instruments are usually used in quantitative research, while the last two instruments are often in qualitative research. However, interviews and observation checklists can still be used in quantitative research once the information gathered is translated into numerical data.



Activity 1. Let's talk

Directions: Read the questions about tools. Then, write your answer on the corresponding space.

Questions to analyze:

1. Why is it necessary to use the right tools for a particular task?

.....

2. What will happen if research instruments are not prepared carefully?

Ans	wers:		
1.		 	
2.			 · · · · · · · · · · · · · · · · · · ·
			 · · · · · · · · · · · · · · · · · · ·
			 f
			/

.....

Activity 2. Let's read

Directions: Read and analyze the given scenario. Answer the guide questions below.

A culmination program was scheduled for Grade 12 students. The highlight of the program is the presentation of the festival of dances. The six sections prepared for the said dance contest during the culmination. A month before the activity, the students already started planning. Their parents were also very supportive in the preparation of their costumes and props. The class advisers also monitored the practices in their classrooms.

During the contest, the PE teacher invited teachers from other schools to serve as a judge. The performances were exemplary, especially the section Rydberg. The section was also a crowd favorite. However, another group that performed poorly compared to Rydberg was pronounced as the winner. Due to the result of the contest, Rydberg and other sections wanted to know the bases for judging. After conducting an investigation, it turned out that no clear criteria were set, and no rating sheets were used.

Guide Questions:

1. What do you think must have been done to avoid the said situation?

2. What can you say about the result of investigation?

3. How will you relate the scenario to the conduct of a quantitative research study?



In constructing the research instrument of the study, there are many factors to be considered. The type of instrument, reasons for choosing the type, and the description and conceptual definition of its parts are some of the factors that need to be decided before constructing a research instrument. Furthermore, it is also very important to understand the concepts of scales of research instruments and how to establish validity and reliability of instruments.

Characteristics of a Good Research Instrument

Concise. Have you tried answering a very long test, and because of its length, you just pick the answer without even reading it? A good research instrument is concise in length yet can elicit the needed data.

Sequential. Questions or items must be arranged well. It is recommended to arrange it from simplest to the most complex. In this way, the instrument will be more favorable to the respondents to answer.

Valid and reliable. The instrument should pass the tests of validity and reliability to get more appropriate and accurate information.

Easily tabulated. Since you will be constructing an instrument for quantitative research, this factor should be considered. Hence, before crafting the instruments, the researcher makes sure that the variable and research questions are established. These will be an important basis for making items in the research instruments.

Ways in Developing Research Instrument

There are three ways you can consider in developing the research instrument for your study. First is **adopting an instrument** from the already utilized instruments from previous related studies. The second way is **modifying an existing instrument** when the available instruments do not yield the exact data that will answer the research problem. And the third way is when the **researcher made his own instrument** that corresponds to the variable and scope of his current study.

Common Scales Used in Quantitative Research

Likert Scale. This is the most common scale used in quantitative research. Respondents were asked to rate or rank statements according to the scale provided.

Example: A Likert scale that measures the attitude of students towards distance learning.

Items	Strongly Agree	Agree	Disagree	Strongly Disagree
There would be difficulty in communicating our concerns to our teacher.				
There would be many distractions when learning at home than in school.				

Semantic Differential. In this scale, a series of bipolar adjectives will be rated by the respondents. This scale seems to be more advantageous since it is more flexible and easier to construct.

Example: On a description of an active student in school activities.

Pleasant	5	4	3	2	1	Unpleasant
Enthusiastic	5	4	3	2	1	Not Enthusiastic
Competent	5	4	3	2	1	Incompetent

Another important consideration in constructing a research instrument is how to establish its validity and reliability.

Types of Validity of Instrument

Face Validity. It is also known as "logical validity." It calls for an initiative judgment of the instruments as it "appear." Just by looking at the instrument, the researcher decides if it is valid.

Content Validity. An instrument that is judged with content validity meets the objectives of the study. It is done by checking the statements or questions if this elicits the needed information. Experts in the field of interest can also provide specific elements that should be measured by the instrument.

Construct Validity. It refers to the validity of instruments as it corresponds to the theoretical construct of the study. It is concerning if a specific measure relates to other measures.

Concurrent Validity. When the instrument can predict results like those similar tests already validated, it has concurrent validity.

Predictive Validity. When the instrument can produce results similar to those similar tests that will be employed in the future, it has predictive validity. This is particularly useful for the aptitude test.



Reliability of Instrument

1	2		
	Reliab	ility refere	s to
	the co	onsistency	of
	the r	neasures	or
	results	of	the
	instrum	nent.	
(4			

Test-retest Reliability. It is achieved by giving the same test to the same group of respondents twice. The consistency of the two scores will be checked.

Equivalent Forms Reliability. It is established by administering two identical tests except for wordings to the same group of respondents.

Internal Consistency Reliability. It determines how well the items measure the same construct. It is reasonable that when a respondent gets a high score in one item, he will also get one in similar items. There are three ways to measure the internal consistency; through the split-half coefficient, Cronbach's alpha, and Kuder-Richardson formula.



Activity 3. Qualify and Rate the Instrument

Directions: Look for sample research instruments from previously conducted research. Rate it on a scale of 1 to 5 (1 = lowest, 5 = highest) based on the criteria given. Then justify you're rating.

Sample Instrument (provide a title of the instrument if possible): Purpose of the Research Instrument:		
Number of Items:		Scale Used:
Criteria for Evaluation of Instrument	Rating	Justification
Concise		
Sequential		
Valid and Reliable		
Easily Tabulated		

Activity 4. Search and evaluate the instrument.

Directions: Search for a sample research study. Identify the ways of establishing the validity and reliability of the instrument.

	Example 1	Example 2
 Title of the Research Study 		
 Type of Research Instrument 		
 Way of Developing the Instrument 		
 Scale Used 		
 How was the validity of the instrument established? 		
 How was the reliability of the instrument established? 		
Source		

Activity 5. Let's go online.

Practice what you have learned from this lesson. Visit the following: <u>https://bit.ly/2A7Q6lz</u> <u>https://bit.ly/2ZD2Kda</u> <u>https://bit.ly/2B0cbcd</u>



What I Have Learned

Directions: As you have learned from this lesson, answer each question comprehensively.

1. Why is it important to have a good research instrument?

2. Differentiate validity and reliability. Explain how they complement each other to make a good research instrument.



What I Can Do

Construct your research instruments and establish validity and reliability

Directions: Fill out the guide table below to be able to create a good research instrument for your study.

1. The goal of your research instrument/s	
2. Parts of your	
instrument/s	
3. Number of items per	
sub-factor: total items	
4. Scale to be used	
5. How will it be	
validated?	
6. How will the reliability	
be established?	



Additional Activity

Direction: After you have filled out the guide table above, start constructing your research instrument for your current study.

Title of your study:

Research Questions:

Research Instrument:

Lesson

Research Intervention



What's In

In the previous discussion on quantitative research designs, you were taught about quasi-experimental and experimental designs. Its uniqueness from other research designs was also described. Remember that experimental research design controls or manipulates the independent variable. This is done by applying particular conditions or treatments or what is called research intervention. In this lesson, the focus is on how to describe your research intervention in your research paper.





Nature of Research Intervention

In experimental research, the researcher decides the nature of intervention or treatment. Intervention pertains to what is going to happen to the subjects of the study. This decision covers **who will receive the intervention** and **to what extent** it will be applied to them.

For example, in a study of determining the effects of special tutorial program to learners at risk of failing (LARF), researcher decides the group of LARF who will receive intervention. In this example, a special tutorial program is the research intervention. Furthermore, the extent to which the program will be administered to the learners is determined.

Steps in Describing the Research Intervention Process

A section that explains the details of research intervention is added in the research paper if it is an experimental design. In this section, the procedure of research intervention is explained clearly.

Write the Background Information. It is an introductory paragraph that explains the relevance of the intervention to the study conducted. It also includes the context and duration of the treatment.

Describe the Differences and Similarities between the Experimental and Control Group. State what will happen and what will not both in the experimental and control groups. This will clearly illustrate the parameters of the research groups.

Describe the Procedures of the Intervention. Describe how will the experimental group receive or experience the condition. It includes how will the intervention happens to achieve the desired result of the study. For example, how will the special tutorial program will take place?

Explain the Basis of Procedures. The reason for choosing the intervention and process should clear and concrete reasons. The researcher explains why the procedures are necessary. In addition, the theoretical and conceptual basis for choosing the procedures is presented to establish the validity of the procedures.



Activity 1. Determine the Research Intervention Procedure

Directions: Search for a sample research study. Distinguished the procedure used in the experimental and control group. Use the table below for your answers.

	Example 1
 Title of the Research Study 	
 Research Intervention Conducted 	
 Procedure Used in Control Group 	
 Procedure Used in Experimental Group 	
	Example 1
 Title of the Research Study 	
 Research Intervention Conducted 	
 Procedure Used in Control Group 	
 Procedure Used in Experimental Group 	

Activity 2. Let's go online.

Visit the following link and learn further about experimental research. <u>https://bit.ly/2Xr5zes</u>



Directions: As you have learned from this lesson, answer each question comprehensively.

- 1. What I know about research intervention
- 2. I have learned that when describing the research intervention....



What I Can Do

Describes your Intervention (if applicable)

Directions: If the design of your research is experimental. Describe your research intervention by following the steps given in this lesson.



Planning Data Collection Procedure



What's In

You have learned the important factors in developing your research instruments in lesson 3 of this Module. You can now identify the steps you are going to undertake in your actual gathering of data. In this lesson, three phases in data collection will be presented so that you can clearly plan your data collection procedure in your current research.



What I Need to Know

Quantitative Data

Generally, data are any pieces of information or facts that people have known. Once these data answer the research problem, it becomes helpful to research. When research data appears to be measurable in the numerical form, it is considered **quantitative data**. However, some qualitative data can also be useful to quantitative research once it is given a numerical value. For example, if you study about adjustment experiences of students to distant learning, if it is categorized and numbered accordingly, then it can be quantified during analysis.

Techniques in Collecting Quantitative Data

The following are the common quantitative data gathering technique. Each technique corresponds to specific instrument which will be further discussed in Module 5.

Observation. It is gathering information about a certain condition by using senses. The researcher records the observation as seen and heard. This is done by direct observation or indirect observation using gadgets or apparatus. An observation checklist aids the researcher in recording the data gathered.

Survey. Data gathering is done through interview or questionnaire. By means of questionnaire you use series of questions or statements that respondents will have to answer. Basically, respondents write or choose their answer from given choices. On the other hand, interview is when you ask respondents orally to tell you the responses. Since you are doing quantitative research, it is expected that responses have numerical value either it is nominal or ordinal in form.

Experiment. When your study is an experimental design, it was already discussed in the previous lesson that it would use treatment or intervention. After the chosen subjects, participants, or respondents undergone the intervention, the effects of such treatment will be measured.



Activity 1: What's the Procedure

Looking at the flowchart of the data gathering procedure, what do you think is the research design of the study?



What Is It

Three Phases in Data Collection

In doing research, data collection is a major component of research. Neglecting to clarify the collection procedure would result in acquiring inaccurate data that will make you research study invalid. Hence, the data collection procedure is given meticulous attention to gather appropriate data. You are making sure that data you will gather answers to your research questions.

The data gathering procedure is presented in a paragraph format in your research paper. Basically, the contents are the steps you are going to follow: (1) **before** you will gather the data, (2) what to do **during** the actual gathering of data, and (3) the things to consider **after** data has been gathered. The following are the suggested steps but not limited to it, are the procedures in gathering quantitative data.

Before	During	After	
 Prepare the research instruments Identify the authorities that will be involved and need to ask permission Determine the samples size and corresponding respondents; per group if applicable. Ask consent form (if respondents are 18 years old above) or parent's consent (if minor). 	 Clear the instructions provided to the respondents. Administer the research instrument or implement the research intervention, if applicable. Collect or gather or take note of the responses. 	 Summarize the data gathered, in a tabular form Analyze the summarize data corresponding to the research questions. 	

• Pilot test the research instrument if needed.



Activity 2. Arrange your Steps

Directions: Arrange the following steps in data gathering into their correct sequence, 1 as being the first step, and 10 as the last step.

Order	Steps
	The respondents will have a chance to have a look at the performance tasks.
	Each of the participants will be interviewed for individual filling out of the personal
	background of media literacy information.
	The researcher will meet the participants eight times in a four-month data
	gathering period.
	The participants will answer the learning activity sheet (LAS) after practicing the
	new approach.
	The data collection in each group will be supervised by two experienced
	Information Technology teachers to ensure proper implementation of the
	intervention.
	The participants will read example situations about media literacy that are not
	familiar to them.
	The new approach in assessing the performance tasks of learners will be
	implemented.
	The list of performance tasks and assessment tools will be prepared.
	The media literacy summative test will be administered after the implementation
	of the new approach in assessing performance tasks.
	The test results will be encoded for summary and will be analyzed.



Directions: As you have learned from this lesson, answer each question comprehensively.

1. This time, I have learned that quantitative data...

2. Techniques in quantitative data gathering help to...

3. In planning my data gathering procedure, I need to consider...



Plan your Data Gathering Procedures

Directions: Perform the following task. From what you have learned in this lesson, list the steps that you are going to follow in gathering the data of your research. For this part, just enumerate it to clearly see the procedure before, during, and after your data gathering.

Before: During: After:



Direction: After you submit your data gathering procedures, once it is corrected in accordance with the guidelines given, you may start incorporating it to your research manuscript in paragraph format and cite your sources.



Planning Data Analysis



What's In

Prerequisite for taking Practical Research 2 is your Statistics and Probability subject. It is presumed that you already have a good practice of the learning competencies needed to conduct quantitative research. Your background statistics and probability background will help you plan and choose your data analysis.

In planning your data analysis in quantitative research, you also need to consider your research problem, type of data, hypothesis, and scale used in your research instrument. This lesson focuses on designing your data analysis procedure.



Data Analysis

Data analysis in research is a process in which gathered information are summarized in such a manner that it will yield answers to the research questions. During quantitative data analysis gathered information were break down and ordered into categories in order to draw trends or patterns in a certain condition. In quantitative research, the numerical data collected is not taken as a whole. In order to understand it better, it is analyzed into components based on the chosen research variables and research questions you are going to answer.

These numerical data are usually subject to statistical treatment depending on the nature of data and the type of research problem presented. The **statistical treatment** makes explicit the different statistical methods and formulas needed to analyze the research data.



What's New

Activity 1: Statistics Recall

Directions: From your previous lessons, recall the following terms in Statistics. Write its definition or description and purpose or function in analyzing data. Fill in the boxes to provide the information about these statistical terms or you may use a separate sheet. Use the table for your answer.

Terms	Definition or Description	Purpose or Function
Data		
Frequency		
Percentage		
Mean		
Standard Deviation		
Table		
Figure		
Parametric Test		
Non-Parametric Test		
Correlation		
Regression		



Planning your Data Analysis

Before choosing what statistical test is appropriate for your research study it is important to determine what statistical formation is applicable to your current study. In immersing yourself into planning your data analysis, you have to decide what basic descriptive statistical technique you are going to use. Although this technique does not give you the degree of association or effect between variables, this will help you to code and simply tabulate your data.

Descriptive Statistical Technique provides a summary of the ordered or sequenced data from your research sample. Examples of these tools are frequency distribution, measure of central tendencies (mean, median, mode), and standard deviation. **Inferential Statistics** is used when the research study focuses on finding predictions; testing hypothesis; and finding interpretations, generalizations, and conclusions. Since this statistical method is more complex and has more advanced mathematical computations, you can use computer software to aid your analysis.

You also must identify types of statistical analysis of variable in your quantitative research. A **univariate analysis** means analysis of one variable. Analysis of two variables such as independent and dependent variables refer to **bivariate analysis** while the **multivariate analysis** involves analysis of the multiple relations between multiple variables.

Furthermore, selecting what test to use is basically done by identifying whether you will use parametric test or non-parametric test. As these were already discussed in your Statistics and Probability subject, a summary of what to consider is presented below:

Points to Consider		Type of Test
Casla	Interval or Ratio	Parametric Tests
Scale	Ordinal or Nominal Scale	Non-parametric Tests
Sampla Siza	30 or more per group	Parametric Tests
Sample Size	Fewer than 30	Non-parametric Tests
	Normal Distribution	Parametric Tests
Distribution of Data	Data deviates from Normal	Non-parametric Tests
	Distribution	

In addition, in choosing statistical techniques in quantitative research, the purpose or objective of the research study should be considered.

Test of Relationship between Two Variables

- Pearson's r (parametric)
- > Phi coefficient (non-parametric for nominal and dichotomous variables)
- > Spearman's rho (non-parametric for ordinal variable)

Test of Difference between Two Data Sets from One Group

- T-test for dependent samples (parametric)
- > McNemar change test (non-parametric for nominal and dichotomous variables)
- > Wilcoxon signed-rank test (non-parametric for ordinal variable)

Test of Difference between Two Data Sets from Two Different Groups

- T-test for independent samples (parametric)
- > Two-way chi-square (non-parametric for nominal variable)
- Mann-Whitney U test (non-parametric for ordinal variable)

Test More than Two Population Means

> Analysis of Variance or ANOVA (parametric)

Test the Strength of Relation or Effect or Impact

Regression (parametric)



Activity 2. Step by step analysis

Directions: From the concept presented in this lesson, create five simple basic procedures in planning the data analysis. What to do beforehand (pre-process) is already given as your guide.

Step	To Do
Pre- process	Identify the types of variables, research question, hypothesis, and scale of measurement.
1.	
2.	
3.	
4.	
5.	

Activity 3. Choose the Appropriate Statistical Test

- Directions: Determine the statistical test/s appropriate for the sample research. Make sure to explain your decision in one to two sentences.
 - 1. Relationship between Academic Stressors and Learning Preferences of Senior High School Students

	Statistical Test/s:
	Explanation:
2.	Reading Electronic Learning Materials as a Support for Vocabulary of Grade 1 Pupils
	Statistical Test/s:
	Explanation:
3.	Impact of the Implementation of COVID – 19 Health Protocols in Supermarkets on Consumer Behaviors
	Statistical Test/s:
	Explanation:
4.	Effects of Morning Exercise on the Health Anxiety Level of Senior Citizens
	Statistical Test/s:
	Explanation:

5. Measuring the Gadgets Usage of Children at Home during Quarantine

Statistical Test/s:	
Explanation:	

Activity 4: Let's go Online

Go to the link below to learn more about statistical techniques for quantitative research.

https://bit.ly/3c6evv2 https://bit.ly/36EfqBZ https://bit.ly/3gmMbYS https://bit.ly/2ZGYNEu https://bit.ly/2A7L6DE https://bit.ly/2TGK4Fr



Directions: As you have learned from this lesson, answer each question comprehensively.

1. This time, I have learned that quantitative research and statistics...

2. The factors to consider before planning the data analysis of the research study are...

3. How do you know the specific statistical tests to be used in a research study?



Plan Data Analysis Using Statistics and Hypothesis Testing

Directions: Perform the following task. From what you have learned in this lesson, fill out the table considering your current research study.

Research Questions	Statistical Tests	Purpose



Direction: After you submit your data analysis plan, once it is corrected in accordance with the guidelines given, you may start incorporating it to your research manuscript in a paragraph format.

Lesson

Presenting Research Methodology



What Is It

Indeed, designing the research methodology in quantitative research is quite challenging. At this point, it is assumed that you are now ready to present your written output. You need to consider the parts of your research methodology; these are:

Research Design Research Population and Sample Sampling Procedure Research Instruments Validity and Reliability of Instruments Research Intervention (if applicable) Data Collection Procedure Data Analysis

All of these are written in paragraph format as part of your research methodology. In this lesson, you will be given guidelines in presenting this research portion. After presentation, the most exciting part follows; and that is gathering your data.



What's More

Activity 1. Personal Work Evaluation

Direction: Rate your own paper using the rubric below. For the purpose of improvement, rate your output as honestly as you can. Use the following scale in evaluating your own paper.

5 - Very Good, 4 - Good, 3 - Fair, 2 - Poor, 1 - Needs Improvement

	Indicator	Self-Rating
1.	Research Design	
	Type and definition were presented, and rational is	
	discussed.	
2.	Sampling Procedure and Sample	
	Population and samples are described, and sampling	
	procedure is clear and relevant.	
3.	Research Instrument, and its Validity and Reliability	
	Basis of decision is explained, instrument is well	
	described, and its validity and reliability were clearly	
	presented.	

4. Data Gathering Procedure Protocols were clear, and steps in the gathering are well stated.	
5. Data Analysis	
Basis and explanations are clearly discussed.	
Total Rating	

Activity 2. Reflection

1. What is your highest and lowest rating? What are your reasons for giving yourself such ratings?

2. Overall, do you think you are ready for presentation of your research paper? Explain your answer.

Activity 3. Let's go online

Visit the following links to further enhance your written problem and to improve you preparation for presentation.

https://bit.ly/2TFhfcy



1. What are the new learnings you have gained from this module in terms of skills, content, and attitude in identifying and stating the research problem?

2. How will you improve your research writing skills in quantitative research?



What I Can Do

Direction: Get ready for presentation of your written statement of the problem. The rubrics below will serve as a guide on how you will be rated by your teacher. The 4C (content, coherence, creativity, communication) technique will be used so that you can easily remember.

	5	4	3	2	1
Content (35%)					
 The parts of the paper are complete and appropriate 					
 The parts of the research methodology are 					
clearly described and justified.					
 Overall content is comprehensive. 					
Coherence (25%)					
 Cohesive of devices are effectively used. 					
 Organization of ideas is smoothly 					
presented.					
Creativity (25%)					
 Writer's voice is showcased. 					
 Paper uses variety of sentence structures. 					
 Uses appropriate language. 					
Communication (15%)					
 Sentences are well structured 					
 Grammatical conventions are observed. 					
 Correct spelling and proper research format 					
is followed.					

Rubrics for Written Research Methodology

Legend:

5- to a very great extent, 4- to a great extent,

3 – to some extent, 2 – to a little extent, 2 – not at all

Summary

- In order to integrate all the components of the research study, the **research design** describes the overall strategy of the research. **Types of quantitative research** are descriptive, correlational, ex post facto, quasi-experimental, and experimental research.
- Population refers to all the members of a particular group relevant to the research.
 Sample is a part of the population that serves as a representative. Sample are chosen through sampling which is a process of selecting of who will participate. The usual sampling procedures in quantitative research are simple random sampling, stratified random sampling, cluster sampling, and systematic sampling.
- **Research Instrument** refers to the tools used in research for the purpose of gathering the data. Common scales used in quantitative research are Likert Scale and Semantic Differential.
- It is important in quantitative research to use valid instruments. **Validity** refers to the appropriateness of the research instrument. **Types of validity** are face, content, construct, concurrent, and predictive validity.
- The consistency in research findings provided by instruments refers to **reliability**. **Types of reliability** are test-retest, equivalent forms, and internal consistency.
- For quasi-experiment and experimental research designs, **intervention** is applied in order to know who will receive the intervention and to what extent.
- **Data gathering** in quantitative research usually observes survey, observation, and experiment. There are **three phases in data gathering** of research that need to be presented in the research paper: before, during, and after procedures.
- **Data Analysis** is a process in which gathered information are summarized in such a manner that it will yield answers to the research questions. There are two major statistical technique in data analysis, these are descriptive and inferential statistics.



Assessment: (Post-Test)

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

- 1. What is the aim Ex post facto research design?
 - A. determine a cause from already existing effects.
 - B. establish cause and effect relationship
 - C. observe and describe a phenomenon
 - D. identify association among variables
- 2. "Effects of Type of Music to Aesthetic Performance of Ballet Dancers", what is the appropriate research design for the given title?
 - A. Correlational

C. Survey Research

B. Descriptive

- D. Experimental
- 3. Mr. Canuc would like to know further the type of social media used between the male and female SHS students of East Pagat National High School. What is the appropriate research design to be used in his study?
 - A. Quasi-Experimental
 - B. Experimental

- C. Correlational
- D. Descriptive
- 4. Based on item number 3, what appropriate statistical test should Mr. Canuc used to answer his research problem?
 - A. T-test for two dependent samples
- C. Chi-square D. ANOVA
- B. Spearman's rho
- 5. Which of the following statements is true about the conduct of experimental research?
 - A. There is no random assignment of individuals.
 - B. Individual subjects are randomly assigned.
 - C. Groups are exposed to presumed cause.
 - D. Intact groups are used.
- 6. What is the difference between quasi-experimental research and experimental research?
 - A. Only one dependent variable is used in quasi-experimental research, while multiple dependent variables can be used in quasi-experimental research.
 - B. Intact groups are used in experimental, while quasi-experimental randomly assigned individuals into groups.
 - C. Participants for groups are randomly selected in experimental, but not quasiexperimental research.
 - D. The researcher controls the intervention in the experimental group, but not quasiexperimental research.
- 7. Why would a researcher choose to use Simple Random Sampling as a sampling technique?
 - A. To consider giving equal chance to the member of accessible population being selected as part of the study.
 - B. To make sure that all subcategories of the population are represented in the selection of sample.
 - C. To group the entire population into clusters since the location of the samples are widely spread.
 - D. To systematically choose samples from a given list of individuals.

- 8. When can we consider a research sample as "best?"
 - A. representative of populationC. conveniently representedB. systematically chosenD. purposely selected

- 9. Given that your study will use stratified random sampling, wherein population of your scope is 250 with a computed sample size of 152, how many samples for each stratum will you have if group 1 has 92, group 2 has 86, and group 3 has 72 population?
 - A. Group 1 = 52, Group 2 = 54, Group 3 = 46
 - B. Group 1 = 56, Group 2 = 45, Group 3 = 51
 - C. Group 1 = 52, Group 2 = 52, Group 3 = 44
 - D. Group 1 = 54, Group 2 = 56, Group 3 = 41
- 10. What type of reliability is measured by administering two tests identical in all aspects except the actual wording of items?
 - A. Internal Consistency Reliability C. Test-retest reliability
 - B. Equivalent Forms Reliability D. Inter-rater Reliability
- 11. What type of validity is when an instrument produces results similar to those of another instrument that will be employed in the future?

A. Predictive Validity	C. Criterion Validity
B. Face Validity	D. Content Validity

12. The Ability Test has been proven to predict the mathematical skills of Senior High School students. What type of test validity is shown in the example?

A. Construct Validity	C. Content Validity
B. Criterion Validity	D. Face Validity

13. What indicator of a good research instrument when items are arranged from simple to complex?

A. Easily Tabulated	C. Valid and Reliable
B. Sequential	D. Concise

- 14. What is the purpose of Pearson's r as a statistical technique? To test the
 - A. difference between sets of data from different groups.
 - B. difference between two sets of data from one group.
 - C. degree of effect research intervention or treatment.
 - D. relationship between two continuous variables.
- 15. What statistical technique should be used for this research problem, "You would like to determine the differences between the opinions of men and women on the COVID - 19 local government response?"
 - A. T-Test for two dependent samples
- C. Two-way Chi-square
- B. T-Test for independent samples D. Pearson's r



A.11 A.21 A.81 D.41 B.31	5.6 8.A 9.0 10.B	1. A 1. A 1. A
		Posttest
11. C 12. B 13. D 14. D	6.A 7.A 9.C 9.C	Pretest 1. D 3. B 4. B 4. B 4. B



Key to Answers

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Mhat's New: Activity 1

Answers May Vary with corresponding sources

What's More: Activity 2

YneV yeM prewanA

What's More: Activity 3

- Pearson'sr or Spearman's tho or phicoefficient – If both variables are interval/ratio and sample size is 30 or more per group then use Pearson'sr. If variables are ordinal in scale, use
 Spearman's tho. If variables are dichotomous then use phi coefficient.
 Prequency or central tendency – Use frequency or central tendency – Use
- nominal or ordinal. Use central tendency if the variable is interval or ratio. 3. Regression – Use regression to predict the effect of implementation of COVID – 19
- A. Regression Use regression to predict the
 A. Regression Use regression to predict the
- A. Regression Ose regression to predict the anxiety level of semior citizens.
 5. Frequency or central tendency - Use
- Frequency of central tendency 0 se frequency distribution if the variable is nominal of ordinal. Use central tendency if the variable is interval of ratio.

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What's More: Activity 1

- Cluster Sampling Hotels are clustered according to size due to number of
- population. 2. Systematic Sampling - Researcher selected every 6th name from the chosen population.
- 3. Simple random sampling Out of the total 3. Simple random sampling - Out of the target sample was obtained. Then will be randomly selected to represent the entire population.

What's More: Activity 2

Answers May Vary

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Shns f vivitoA :weW a'tsdW

YneV yeM prewenA

What's More: Activity 3 and 4

AleA YeM shewanA

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References

- Center for Quality Research. 2015. "Overview of Quantitative Research Methods." YouTube. Accessed June 3, 2020. <u>https://bit.ly/36A5idi</u>
- Creswell, John W. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 3rd ed., SAGE Publications, Inc. 2009. <u>https://bit.ly/2X3Bra3</u>
- Fraenkel, Jack R. and Wallen, Norman E. *How to Design and Evaluate Research in Education.* Asia: Mc-Graw Hill Companies, Inc., 2006.
- Fraenkel, Jack R. and Wallen, Norman E. 2020. *How to Design and Evaluate Research in Education.* 6th ed., McGraw-Hill Global Education Holdings, LLC. Accessed June 3, 2020. https://bit.ly/3eBIVrs
- I Hope. 2020. "Kinds of Quantitative Research Designs." YouTube. Accessed June 3, 2020. https://bit.ly/2LZVLCS
- Keyton, Joann. 2020 "Chapter 7: Multiple Choice Quiz." McGraw-Hill Global Education Holdings, LLC. Accessed June 3, 2020. <u>https://bit.ly/3eojlWk</u>

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