LEARNING ACTIVITY SHEET

SPECIAL PROGRAM IN ICT 10 INFORMATION SYSTEM AND RESEARCH 10

Second Quarter, Week 2

Name of Learner:___ Date:___

Grade Level /Section: ___

Hypothesis and Variables

BACKGROUND INFORMATION FOR THE LEARNERS

Hypothesis and Variables are essential part in conducting research specifically scientific investigation or research. The initial step in a research process is the identification of a problem which is followed by the formulation of tentative solution to the identified problem. A **hypothesis** is also defined as an educated guess or tentative answer to a research question. A hypothesis should be testable by doing an experiment.

Characteristics of a research hypothesis

1. **Testable and Verifiable.** A research hypothesis has to be tested for possible approval and rejection which is done statistically.

2. **Simple and Clear.** A simple wording of hypothesis will be easy to read and understand and it should be clear from every perspective.
3. **Relevant.** A hypothesis should be related to the direction in which a research study is planned and it is possible answer to a research question.

HYPOTHESIS may be stated in any of the following terms:

a. **Null statement**. A hypothesis of "no difference" and it is formulated for the purpose of being

rejected.

b. **Alternative statement.** It is the statement of research hypothesis or the prediction derived from

the theory being tested.

c. **Cause and Effect statement.** It reveals the connection of two variables of the main subject in

the study.

Example of Research Problem
LO

What are the factors affecting the growth of a bean plant?
Suggested factors – sunlight and water

Null Hypothesis	**Alternative Hypothesis**	**Cause and Effect**
1. Varying amount of sunlight has no significant effect	1. Varying amount of sunlight has significant effect on	1. If the amount of sunlight is varied, then the growth of

on the growth of bean plant	the growth of bean plant	bean plant is affected.
2. Varying amount of water has no significant effect on the growth of bean plant.	2. Varying amount of water has significant effect on the growth of bean plant.	2. If the amount of water is varied, then the growth of bean plant is affected.

WHAT ARE VARIABLES?

Variables are characteristics of people, things, property, events and quantity than can be taken on different values.

Example: *Effect of sunlight and water on the growth of bean plant.*

The variables are the following:

1. Length of stem, yield per plant, number of flowers and leaves.
2. Amount of water
3. Intensity and frequency of sunlight.

INDEPENDENT AND DEPENDENT VARIABLES

Independent Variable – a variable that can be manipulated or changed by the researcher and has a direct effect on the dependent variable. In terms of the cause and effect, an independent variable is the cause.

Dependent Variable – is the effect or the outcome in response to the independent variable. It is also pertains to the change in the characteristic of the subject that is recorded during investigation or experimentation.

Example: *In the Effect of sunlight and water on the growth of bean plant, the Independent variables are sunlight and water while the dependent variable is the growth of bean plant.*

QUANTITATIVE vs. QUALITATIVE VARIABLES

1. **Quantitative variable –** can take values that are numeric that represent measurable quantity. It is also called as numerical –valued.

   Example: age, height, weight, number of items, grades.

   Classifications of Quantitative variable

   a. **Discrete variable –** values are obtained by counting.
   b. **Continuous variable –** values are obtained by measuring.

2. **Qualitative variable –** It is a variable that cannot be measured. It is also known as categorical variable. The

values do not result from counting and measuring.

Example: religion, hair or eye colors, educational level, gender, civil status, year level, socioeconomic status, profession.

LEVELS OF MEASUREMENT OF VARIABLES

Measurements are classified into four (4) scales.

1. Nominal Scale – it describes variable with categories without order or ranking. It is used for labeling variables. Nominal scales are kind of like “names” or labels.
   Example: gender (1- male, 2- female) number of students according to grade level (1- grade 7 , 2- grade 8, 3- grade, 4- grade 10).
2. Ordinal Scale – it is a level of measurement that describes ranking or order of data. It indicates order.
   Example: degree of pain (mild, moderate, severe), age according to position in the family (1^{st}, 2^{nd}, 3^{rd}, 4^{th}…)
3. Interval Scale – it is a measurement variable where there is order and the difference between two values is known. There is no absolute zero in this scale.

Example: Test scores from 30 to 40 are of equal difference compared to a test scores from 40 to 50 (both are having interval of 10 points), temperature reading is 0 degrees Celsius does not mean that there is no measured temperature in this case.

4. Ratio Scale – it is also similar to interval scale as to spacing between point values. There is absolute zero in this scale, meaning there is absence of quantity being measured. Example: speed, weight, height, volume.

LEARNING COMPETENCY

Formulate a hypothesis and Identify research variables.

ACTIVITIES

ACTIVITY NO. 1

Directions: Identify the independent variable (IV) and Dependent variable (DV). Write the correct answer on the space provided.

1. Students attending earth quake drill are more prepared to react appropriately before, during and after earthquake than students without earthquake drill.

IV - _____
DV - _____

2. Students who have earned the diploma program in SHS academic track are more likely to experience less stress in

taking college entrance test, compared to those who have completed a vocational program.

IV - _____
DV - _____

3. Students who are praised (reinforcement) by teachers for their accomplishments tend to perform better in academic performance than students.

IV - _____
DV - _____

4. There is no significant relationship between number of cigarettes smoke and risk of lung cancer.

IV - _____
DV - _____

5. Students who have more difficulty in breathing (observed) after taking examination are stressed by fear of failing (general) compared to students who are not stressed,"

IV - _____
DV - _____

ACTIVITY NO. 2

Directions: State the null, alternative and cause and effect hypothesis of the following research questions.

1. Is there a significant relationship between the gender of the JHS students and their attitudes toward the new normal school policy?

Null Hypothesis	Alternative Hypothesis

2. Is there a significant difference between attitude of JHS students in private and public school toward the new normal school policy?

Null Hypothesis	Alternative Hypothesis

3. Effects of Varying Temperature and Concentrations on the Index of Refraction of Sugar Solution

Null Hypothesis	Null Hypothesis	Cause and Effect Hypothesis

ACTIVITY NO. 3

Directions: Identify the levels of measurement of the following variables.

_____1. Religion
_____2. Inorganic and organic fertilizer
_____3. Amount of water
_____4. Anxiety level
_____5. Height
_____6. Celsius
_____7. Number of beans
_____8. Length of hair
_____9. Average speed of 50 m/s.
_____10. Age of children

REFERENCES

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KEY TO CORRECTIONS

ACTIVITY 3

1. Nominal
2. Nominal
3. Ratio
4. Ordinal
5. Ratio
6. Interval
7. Nominal
8. Ratio
9. Ratio
10. Ratio

ACTIVITY 2

1. Null Hypothesis
   - There is no significant relationship between the gender of the JHS students and their attitudes toward the new normal school policy.

   Alternative Hypothesis
   - There is significant relationship between the gender of the JHS students and their attitudes toward the new normal school policy.
2. Null Hypothesis
   - There is no significant difference between attitude of JHS students in private and public school toward the new normal school policy.

   Alternative Hypothesis
   - There is significant difference between attitude of JHS students in private and public school toward the new normal school policy.
3. Null Hypothesis
   - Varying temperatures and concentrations have no significant effect on the index of refraction of a sugar solution

   Alternative Hypothesis
   - Varying temperatures and concentrations have a significant effect on the index of refraction of a sugar solution

   Cause and Effect Hypothesis
   - temperature and concentration are varied then the index of refraction of a sugar solution is affected.

4.

ACTIVITY 1

1. IV – earthquake drill
   DV – level of preparedness before, during and after earthquake
2. IV - earned diploma program
   DV – level of stress in taking entrance test
3. IV – praise/reinforcement
   DV – academic performance
4. IV – number of cigarettes
   DV – lung cancer
5. IV – stress by fear of failing

DV – difficulty of breathing