



HANDOUT #8

EM200 Methods of Research
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1. What is Hypothesis?

According to Jha (2011),

- (a) It is a scientific outlook towards the research and it leads the research to the correct direction
- (b) It helps the researcher to decide what sort of information has to be collected in relation to the problem and how to relate the information
- (c) It plays an important role in deciding the samples, tool, from where to get the data and which statistical method should be applicable
- (d) It is in predictive statement which comprises of two or more variables and these variables show relationship with each other

On the other hand, It is defined as a wide guess that is formulated and temporarily adopted to explain the observed facts covered by the study (Paler-Calmorin & Calmorin, 2007). In addition, hypothesis is important for it tells the researcher on "what to do" and "how to go about" solving a research problem or objectives.

According to Frankfort-Nachmias and Nachmias (1997), a hypothesis is a tentative answer to a research problem, expressly in the form of a clearly stated relation between the independent and the dependent variables. Hypotheses are tentative answers because they can be verified only after they have been tested empirically. If it is rejected another one is put forward, otherwise it is accepted, then it is incorporated into the body of scientific knowledge. Moreover, there are four (4) common characteristics of the hypothesis: *clear, specific, testable or amenable (open) to empirical testing with the available research methods, and value-free*. In addition (Jha, 2011) identifies good hypothesis as in the *simplest form, precise, it ensures that sample is accessible and approachable, including the tools and techniques*.

Fraenkel, Wallen & Hyun (2013) defines hypothesis as simply as a "prediction of the possible outcomes of a study. It is a restatement of the research question (research problem). Example:

Research Question: Will students who are taught history by a teacher of the same gender like the subject more than students taught by a teacher of a different gender?

Hypothesis: Students taught history by a teacher of the same sex will like the subject more than students taught history by a teacher of a different gender

*** (Note: Dependent variable – liking for history; Independent variable – gender of the teacher)*

Moreover, there are *directional hypothesis and nondirectional hypothesis*. A *directional hypothesis* indicates specific direction (such as higher, lower, more or less) that a researcher expects to emerge in a relationship. Thus, it is a prediction about the specific nature of a relationship. Example: Method A is more effective than Method B. The *nondirectional hypothesis* does not make a specific prediction about what direction the outcome of the study will take. Thus, it is a prediction that a relationship exists without specifying its exact nature. Example: There will be a difference between Method A and Method B.

There are two types of hypothesis: Null hypothesis (H_0) and Alternative hypothesis (H_1). The null hypothesis (stated in negative form) is a denial of an existence of a trait, characteristic, quality, value, correlation or difference of results while



alternative hypothesis (stated in positive form) is an affirmation of the existence of observed phenomena; and the opposite of null hypothesis.

Examples:

Specific Research Problem/Question: *Is there a significant difference on the yield of peanuts planted in pots using night soil and chicken dung as fertilizers?*

Null hypothesis (H₀): There is no significant difference on the yield of peanuts planted in pots using night soil and chicken dung as fertilizers.

2. What is assumption?

It is statement that need not to be tested (Castillo, 2007). It is accepted as facts based on observations or based on the existing literature. The assumption must be stated when there is controversy on the acceptability of a theory/concept/research method or instruments which the proposed research considers acceptable (Castillo, 2002 as cited by Castillo, 2007).

According to Paler-Calmorin & Calmorin (2007), assumptions are presumed to be true statements of facts related to the research problem.

Examples: *That the teachers' ability to cope with frustrations can lead to efficiency in their assigned teaching fields.*
That the teachers' coping mechanisms can lead to a closer understanding of the relationship with the students.

3. Theoretical Framework and Conceptual Framework

Theoretical Framework shapes the justification of the research problem/research objectives in order to provide the legal basis for defining its parameters. Conceptual Framework presents specific and well-defined concepts which are called constructs which are derived from abstract concepts of the theoretical framework. Both frameworks provide clear explanation regarding the relationship of variables.

4. Sampling Design

Population refers to the description of the elements that is to focus the study. These elements can be persons, organizations, objects, etc that focus the study. Thus, population means a well-defined, aggregate or total groups of people, objects or individuals.

Sampling is applicable if the populations if the population of the study is too large especially the 7Ms – manpower, money, materials, machinery, methods, moment, and marketing of the researchers are LIMITED. It is defined as the method of getting a representative portion of a population. Sampling is advisable if the population is equal to or more than 100.

Sample size determination:
$$S = \frac{NV + [Se^2 (1-p)]}{NSe + [V^2 p(1-p)]}$$

Where: S = sample size

N = total number of population

V = standard deviation (2.58) at 1 percent level of probability with 0.99 reliability

Se = sample error (0.11)

P = largest possible proportion (0.50)



5. Characteristics of Sampling

- (a) It is small in size, (b) it represents the population (c) it has the characteristics of population (d) its findings are applied on population (e) it is unbiased (f) it is approachable (g) it is true representative of population (h) it deals with accuracy (i) it is reliable

6. Kinds of Sampling Designs

6.1 Scientific Sampling (restricted random, unrestricted random, stratified random, systematic, multistage, and cluster)

6.2 Non-scientific Sampling (purposive, incidental, quota)

7. Advantages of Sampling

- It saves time, money and effort
- It is more effective
- It is faster, cheaper and economical
- It is more accurate and reliable
- It gives more comprehensive information
- It reduces the efforts associated with gathering and analyzing the data
- It is easily manageable
- It reduces requirements for trained personnel to conduct the fieldwork

8. Data Processing

Data processing involves INPUT, THROUGHPUT (PROCESS) AND OUTPUT mechanisms.

Inputs involves the responses from the research instruments by the subjects of the study; Throughput includes statistical procedures and techniques, and output is the results of the study which are presented in data matrix form.

It is means of converting information either manually or by machine into quantitative and qualitative forms for use in research analysis. It consists of three basic steps: categorization, coding and tabulation of data.

- 1.1 Categorization – refers to the grouping of subjects under study according to the objectives or purposes of the study.
- 1.2 Coding of data – information from questionnaires, tests, interview schedules, rating scale, must be transformed into coded items to facilitate tabulation of data which can be numerical or alphabetical.
- 1.3 Tabulation of data – this is done by tallying and counting the raw data to arrive at a frequency distribution and to facilitate in organizing them in a systematic order in a table or several tables. Tabulation can be done either manually or by machine like computers.
- 1.4 Data Matrix – this is presentation of data which is normally in tabular form; and the data processing is either quantitative or qualitative. It is useful in analysis and interpretation to have a clearer picture of the results of the study.

9. Data and Collection

Data constitute an accepted number, quantity, facts or relation used as a basic information for drawing conclusions making inferences, or carrying out investigations (Good, 2000 as cited by Castillo, 2007).

Commonly techniques used in data collection are: Questionnaire/Survey (b) Observation (c) Interview (d) Psychological Test (e) Library Technique.



10. Statistical Treatment

It is the use of appropriate statistical tool to arrive at accurate and definite interpretation of results.

Examples are as follows: weighted arithmetic mean, percentage rating,

The use of Microsoft Excel and SPSS softwares:

SPSS = Statistical Package for Social Science

Examples of statistical parameters: t-test, linear correlation, coefficient of correlation, analysis of variance (ANOVA), chi-square, multiple regression analysis, standard deviation