



## HANDOUT #1

EM200 Methods of Research  
Engr. Reynaldo P Ramos, PhD

M-F 5:00-8:00PM Summer 2019  
CED Building

### 1. Introduction

**RESEARCH:** Composed of two words – “re” and “search” which means to search again or to search for new facts or to modify older one in any branch of knowledge.

- Research means search for knowledge through objective and systematic method of finding solution to a problem
- It is a scientific and systematic search for pertinent information on a specific topic
- It is an art of scientific investigation
- It is a careful investigation for inquiry especially through search for new facts
- It is a critical enquiry or examination in seeking facts or principles: diligent (conscientious/thorough) investigation
- It is a systematized effort to discover, gain or generate new knowledge
- It is a systematic and refined technique of thinking
- It is an honest, exhaustive/comprehensive, intelligent searching for facts, their meanings or implications with reference to given problem.
- It constitutes a method for the discovery of truth which is a method of critical thinking
- It is a continuous discovery and exploration of the unknown
- It is a systematic study of trend or event which involves careful collection, presentation, analysis and interpretation of quantitative data or facts that relates to man's thinking with reality
- It is a movement – movement from the known to unknown. A voyage of discovery
- It can lead to uncovering the answers to impossible questions
- Research is not about finding out something that someone else knows – research means pushing forward the boundaries of human knowledge
- Research is a process of collecting and analyzing data for the advancement of knowledge

### HOLISTIC DEFINITION OF RESEARCH

- It is a systematic method consisting of enunciating/articulating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and researching certain conclusions either in the form of solutions towards the concerned problem or in certain generalization for some theoretical formulation
- It comprises of defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis

**KNOWLEDGE:** It is a prime source of beauty, sociability, practicability, work and reason, discussion and speculations. It is one aspect or other exists in a person in an unusual manner which is transferred from generation to another generation. Knowledge can be derived or sourced from: formal (experience, nature), informal (logic, efforts, intuition), unformal (mistakes common sense), and educational (practical).

**INQUIRY/ENQUIRY:** It is an approach to learning that involves a process of exploring the natural or material world that leads to asking questions and making discoveries in the search for new understandings. It is a process that has the aim of augmenting knowledge, resolving doubt or solving a problem. The nature of inquiry:



- It is in the form of problem, question, an obstacle, discussion, interview or encounter, hypothesis, verifiable, checklist and divergent (different/opposing) thinking

**SCIENTIFIC THINKING:** It is an inductive-deductive mode of thinking or reasoning. It is based on empirical (experimental/observed/realistic) evidences and establishes cause and effect relationship. Thus, a research is an example of scientific thinking

**CRITICAL THINKING:** It defined as having a healthy skepticism (doubt or disbelief) that is able to reason analytically. Analyze where the ideas come from and if the information is factual; examine logic, reason, and strength of claims; formulate reasons and come-up with methods fostered/taken from critical thinking; test your own claims and how reasonable your claims are; learn to look at alternative reasons or show different sources of evidences. Critical thinking helps researcher to arrive at a sound decision especially when there are inconsistencies in various arguments.

**THEORY:** It indicates towards the value of artificial and innovative usability. It is an attempt to develop a general explanation for some phenomenon. It is concerned with explanation and therefore focuses on determining cause-effect relationship. It is also clarifies the relationship between evidences and at the same time it gives meaning to the existed relationship and thus presents it in an appropriate form.

**SCIENTIFIC METHOD:** It involves testing of ideas in the public arena. Private procedures, speculations, and conclusions are not scientific until they are made public. The general order of the scientific method is as follows: (a) identifying a problem or question, (b) clarifying the problem, (c) determining the information needed and how to obtain it, (d) organizing the information, and (e) interpreting the results.

*In other words, the essence of all research originates in curiosity – a desire to find out how and why things happen, including why people do the things they do, as well as whether or not certain ways of doing things work better than others.*

## 2. Why Research?

***It is important to conduct or do research because:***

- It is a major contributor towards attainment of national development goals
- It plays a major role in shaping the nature's future development and modernization
- In particular, undergraduate or college thesis is not compilation of the ideas of the writers or researchers but an organization of their views in one's own way to show the relation of the different ideas and if possible, to draw conclusions based on one's readings.
- Its purpose to answer a specific question, to solve a particular controversy or issue
- Its primary objective is to (a) seek new knowledge and (2) provide useful information in the form of verification.

***Thus the value of Research to Man as follows:***

- Research improves quality of life
- Research improves instruction
- Research improves student's achievement
- Research improves teacher's competence
- Research satisfies man's needs
- Research reduces the burden of work



- Research has deep-seated psychological aspects
- Research improves the exportation of food products
- Research responds to the economic recovery and austerity measure of the country
- Research trains graduates to become responsive to the economic development of the country and compete globally (ASEAN integration and entrepreneurship)

### 3. Characteristics of Research

- Empirical – direct/practical experience or observation
- Logical – valid procedures and principles
- Cyclical- it starts with a problem and ends with a problem; continuous endeavor
- Analytical – utilize proven analytical procedures in gathering data, whether historical, descriptive, experimental and case study
- Critical – exhibits careful and precise judgment
- Methodical – in methodical or orderly manner without bias using systematic/organised methods and procedures
- Replicability – research design and procedures are replicated or repeated to enable the researchers to arrive at valid and conclusive results. It mean using the same instrument, method and procedure but to different venues and subjects

### 4. Qualities of a Good Researcher

R = research-oriented, E=efficient, S= scientific, E= effective, A=active, R=resourceful, C=creative, H=honest, E= economical, and R=religious (*Paler-Calmorin & Calmorin, 2007*)

**R= responsibility, E=excellence, S=scholarly, E=enhancement, A=acceptability, R=re-invent, C=career, H=heart, E=extension, R=rewards/recognition**

### 5. Characteristics of the Researcher

- Intellectual curiosity – deep thinking and inquiry
- Prudence –careful to conduct research at the right time and place, wisely, efficiently and economically.
- Healthy criticism – always doubtful as to the truthfulness and veracity/authenticity of the results
- Intellectual Honesty – honest to collect or gather data or facts in order to arrive at honest results
- Intellectual Creativity – creates new researches and innovative

### 6. Types of Research

- Basic Research – called fundamental research or pure research which seeks to discover basic truths or principles.  
(Boyle's Law, Charles Law, Archimedes Law, Newton's Law, Hooke's Law)
- Applied Research – seeking new applications of scientific knowledge to the solution of a problem
- Developmental Research – decision-oriented research involving the application of the steps of the scientific method in response to an immediate need to improve existing practices

### 7. Classification of Research

- Library Research – done in the library where answers to specific questions or problems. Field an laboratory researches also make use of the library researches
- Field Research – conducted in a natural setting and applicable to descriptive survey and experimental methods
- Laboratory Research – conducted in artificial or controlled conditions by isolating the study in a thoroughly specified and equipped area. It is applicable to experimental, descriptive and case study methods



**THESIS:** A formal and lengthy research paper, especially one written in partial fulfillment of the requirements for a master's degree.

**DISSERTATION:** It is more sophisticated research paper written in partial fulfillment of the requirements for a doctorate degree.

#### REFERENCES AND SUGGESTED READING MATERIALS

- 1 Albert, J. R. (2008). *Basic Statistics for the Tertiary Level*, Padua, Patungan & Marquez (eds), Manila: Rex Book Store.
- 2 Asaad, A. S. (2008). *Statistics Made Simple for Researchers*, Manila: Rex Book Store, Manila.
- 3 Castillo, F. S. (2007). *Research Education and Scientific Writing*, Latest Edition, Manila: Booklore Publishing Corporation
- 4 Finkelsten, L. Jr (2005). *Pocket Book of Technical Writing for Engineers and Scientists*, 2<sup>nd</sup> Edition, McGraw-Hill (Asia)
- 5 Fraenkel, K. R., Wallen, N. E., and Hyun, H. H. (2013). *How to Design and Evaluate Research in Education*, 8<sup>th</sup> Edition, New York, USA: McGraw-Hill International Edition
- 6 Frankfort-Nachmias, C., and Nachmias, D. (1997). *Research Methods in the Social Sciences*, 5<sup>th</sup> Edition, London: Arnold.
- 7 Fraenkel, K. R., and Wallen, N. E. (2010). *How to Design and Evaluate Research in Education*, 7<sup>th</sup> Edition, New York, USA: McGraw-Hill International Edition
- 8 Jha, A. S. (2011). *Research Methodology*, Delhi, India: APH Publishing Corporation
- 9 Mustafa, A. (2010). *Research Methodology*, India: AITBS Publishers
- 10 Paler-Calmorin, L, & Calmorin, M. A. (2007). *Research Methods and Thesis Writing*, 2<sup>nd</sup> edition, Manila: Rex Book Store
- 11 Sanchez, C. A. (1997). *Methods Techniques of Research*, 3<sup>rd</sup> Edition, Manila: Rex Book Store
- 12 Tayie, S. (2005). *Research Methods and Writing Research Proposals*, Pathways to Higher Education Project, Center for Advancement of Postgraduate Studies and Research in Engineering Sciences, Faculty of Engineering – Cairo University
- 13 Trinidad, J.E (2018). *Researching, Philippine Realities: A Guide to Qualitative, Quantitative, and Humanities Research*, Quezon City: Ateneo De Manila University Press

#### **INDIVIDUAL ASSIGNMENT #1**

**DUE DATE: 30 APRIL (TUESDAY) 2019**

1. Select or choice a Master's thesis submitted to the Graduate School that is related to your degree. Photocopy the title page (NOT the thesis cover) and the abstract of the thesis.
2. Evaluate the contents of the abstract based on the information included in the text (Refer to Handout#2). Identify the following:
  - (a) Type (s) and classification of research used (Refer to Items 6 and 7 of this Handout #1)
  - (b) Objectives of the study
  - (c) Methodology used
  - (d) Techniques used in data analysis
  - (e) Significant results and findings
  - (f) Contribution to the body of knowledge
3. Submit your answers in a bond of paper (Short bond size, type-written, 1.5 spacing 11/12 fonts, Times Roman/Arial/Calibri) bearing your name, email address and contact number. Observe proper citation and APA referencing (if necessary/relevant). **JUST STAPLE THE REPORT AND NO PLASTIC COVER OR FOLDER.**

**"PLAGIARISM IS AN ACADEMIC OFFENSE, NOT TO BE TOLERATED"**