



الكلية العالمية للهندسة والتكنولوجيا
GLOBAL COLLEGE OF ENGINEERING AND TECHNOLOGY

Workshop on Research Methodology and Analysis

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What is Research?

- A careful investigation for new facts in any branch of knowledge
- Research is an endeavour to discover answers to intellectual and practical problems through the application of scientific method.

Redman and Mory:

- Research is a systematic effort to gain new knowledge



What is Research?

- **Clifford Woody:**
 - Defining and redefining problems, formulating hypothesis/objectives;
 - Collecting, organizing and evaluating data;
 - Making deductions and reaching conclusions;
 - Testing the conclusions to determine whether they fit the formulated hypothesis/objectives



Why do research?

- Desire to get a research degree along with its consequential benefits
- Desire to face the challenge in solving the unsolved problems
- Desire to get intellectual joy of doing some creative work
- Desire to be of service to society
- Desire to get respectability
- Directives of government, employment conditions etc.
- **Improve methods**
- Demands of the Job
- For publication/patent



Characteristics of research

- **Systematic**- All steps must be inter related-one to another
- **Logical**- Agreeing with the principles of logic
- **Empirical**- Conclusions should be based on evidences/observations
- **Objectivity**- It must answer the research questions
- **Quality control**- Accurate measurements. All well designed and conducted research has potential application



Types of research

1. Application- Pure and Applied Research

Applied- Finding solutions for immediate problems facing a society/industry

Pure- Concerned with generalization and formulation of a theory

2. Inquiry Mode- Quantitative and qualitative

Quantitative- Measurements of quantity or amount

Qualitative- Concerned with qualitative phenomena (reasons for human behavior)



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Research Methodology

- It is the study of methods , so as to solve the research problem.
- Science of learning the way research should be performed systematically.
- Refers to rigorous analysis of the methods applied in the stream of research ; to ensure that the conclusions drawn are valid , reliable & credible too.
- The system of collecting data for research projects is known as research methodology.



Research Methodology

- Research methodology is a guide to research & how it is conducted.
- It explains and examines different methods, highlighting their limitations and resources. It clarifies their assumptions and impacts, and discusses their potential at the frontiers of knowledge.



Research Problem

- **What:** What is the problem that the research will address.
- **Why:** Identify the conceptual basis for the problem i.e what does the literature outline as the cause of the problem?
- **How, Where, and When:** Describe the impact of the problem. How are researchers' understanding negatively impacted by the problem? When and where is the problem evident?



Good Research Problem

- A good research problem should have the following characteristics:
 - It should address a gap in knowledge
 - It should be significant enough to the existing body of research
 - It should lead to further research
 - The problem should render itself to investigation through collection of data
 - It should be of interest to the researcher and suit his/her skills, time, and resources
 - The approach towards solving the problem should be ethical



Research Proposal

- **Title:** A concise and descriptive title.
- **Abstract:** A brief summary of the research proposal.
- **Introduction:** Introduction to the research topic, including background information and the significance of the study.
- **Literature Review:** A review of existing research related to the topic.
- **Research Objectives:** Clear and specific research questions or hypotheses.
- **Methodology:** The research methods and techniques to be used for data collection and analysis.
- **Expected Outcomes:** The anticipated results and their potential impact.
- **Timeline:** A timeline outlining the major milestones and deadlines for the research.
- **References:** A list of sources cited in the proposal.



Research Proposal Activity

- Activity



Research Paper writing

- Find suitable/specified journals
- Get copy of Instructions to authors
- Prepare article as per instructions
- Select suitable titles
- Authors and affiliations
- Abstract
- Highlights
- Novelty statements
- Introduction
- Materials and methods
- Results and discussion
- Conclusions
- Acknowledgements
- References



Thank You!