



الكلية العالمية للهندسة والتكنولوجيا

GLOBAL COLLEGE OF ENGINEERING AND TECHNOLOGY

Workshop on Research Methodology and Analysis

Dr. Mudassar Hussain

Associate Professor

Department of Computer Science and Creative Technologies

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 formulating 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)



Types of research

1. Application

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

Pure- Concerned with generalization and formulation of a theory

2. Inquiry Mode

Quantitative- Measurements of quantity or amount

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



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!