Research Methodology

Lecture 1:
An Introduction

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Recommended books

- Research Methodology a step-by-step guide for beginners, Ranjit Kumar, 3rd edition, 2011.
- Research Methodology Methods and Techniques, C.R. Kothari, 3Sd edition, 2004.
- Fundamental of Research Methodology and Statistics, Yogesh Kumar Singh, 2006.
- How to do the Final Year Projects A practical Guideline for Computer Science and IT Students, Hossein Hassani, 2012.

Term Research

• The term 'Research' consists of two words:

Research = Re + Search

• 'Re' means again and again and 'Search' means to find out something, the following is the Process:



 The research is a process of which a person observes the phenomena again and again and collects the data and on the basis of data he draws some conclusions.

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Meaning Of Research

- Redman and Mory define research as a systematized effort to gain new knowledge.
- The Advanced Learner's Dictionary of Current English lays down the meaning of research as a careful investigation or inquiry specially through search for new facts in any branch of knowledge
- Research In common parlance refers to a search for knowledge.

General Characteristics Of Research

- The following characteristics may be gathered from the definitions of 'Research':
- 1. Research means finding answers to the questions.
- 2. It is logical and objective.
- 3. It is a systematic search for truth.
- 4. It gathers new knowledge or data from primary or first-hand sources.
- 5. Through research, new and original information, ideas about the world we live in, are obtained.

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General Characteristics Of Research

- 6. It is an exact systematic and accurate investigation.
- 7. Research is carefully recorded and reported.
- 8. Research is search for knowledge.
- 9. Conclusions and generalizations are arrived at carefully and cautiously
- 10. Research is defined as a scientific and systematic search for information on a specific topic.

Motivation In Research

- What makes people to undertake research? This is a question of fundamental importance. The possible motives for doing research may be either one or more of the following:
- 1. Desire to get a research degree along with its consequential benefits;
- 2. Desire to face the challenge in solving the unsolved problems, i.e., concern over practical problems initiates research;
- 3. Desire to get intellectual joy of doing some creative work;
- 4. Desire to be of service to society;
- 5. Desire to get respectability.

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Objectives Of Research

- The research has the following three objectives:
- 1. Theoretical objective: Those researches whose objectives are theoretical formulate the new theories, principles or laws. Such type of research is explanatory because it explains the relationships of certain variables. These researches contribute some basic knowledge to the human knowledge. The researches in different disciplines i.e., Physics, Chemistry, Mathematics etc. have the theoretical objective.

Objectives Of Research

- 1. Factual objective: Those researches whose objective is factual find out new facts. This objective is by nature descriptive. These researches describe facts or events which happened previously. Such type of research is done in history.
- 2. Application objective: The research having application objective does not contribute a new knowledge in the fund of human knowledge but suggests new applications. By application we mean improvement and modification in practice. For example if anyone gives a new application of electricity then such type of research has application objective.

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Types Of Research

- The basic types of research are as follows:
- 1. Descriptive vs. Analytical:
- **Descriptive research** includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present.
- In analytical research, on the other hand, the researcher has to use facts or
 information already available, and analyze these to make a critical
 evaluation of the material.

Types Of Research

- **2. Applied vs. Fundamental:** Research can either be applied (or action) research or fundamental (to basic or pure) research.
- **Applied research** aims at finding a solution for an immediate problem facing a society or an industrial/business organization.
- whereas fundamental research is mainly concerned with generalizations and with the formulation of a theory.
- 3. Quantitative vs. Qualitative:
- Quantitative research is based on the measurement of quantity or amount.

 It is applicable to phenomena that can be expressed in terms of quantity.
- Qualitative research, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind.

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Types Of Research

- 4. Conceptual vs. Empirical:
- Conceptual research is that related to some abstract idea(s) or theory. It is
 generally used by philosophers and thinkers to develop new concepts or to
 reinterpret existing ones.
- **Empirical research** relies on experience or observation alone, often without due regard for system and theory. It is data-based research, coming up with conclusions which are capable of being verified by observation or experiment. We can also call it as experimental type of research.

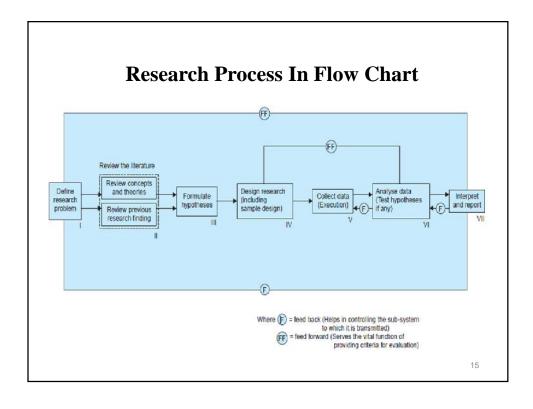
Research Process

- Before embarking on the details of research methodology and techniques, it seems appropriate to present a brief overview of the research process.
- Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps.
- The following order concerning various steps provides a useful procedural guideline regarding the research process:
- 1. Formulating The Research Problem;
- 2. Extensive Literature Survey;
- 3. Developing The Hypothesis;
- 4. Preparing The Research Design;

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Research Process

- 5. Determining Sample Design;
- 6. Collecting The Data;
- 7. Execution Of The Project;
- 8. Analysis Of Data;
- 9. Hypothesis Testing;
- 10. Generalizations And Interpretation,
- 11. Preparation Of The Report Or Presentation Of The Results, I.E., Formal Write-up Of Conclusions Reached.



Criteria of Good Research

- The scientific research should satisfy the following criteria
- 1. The purpose of the research should be clearly defined and common concepts be used.
- The research procedure used should be described in sufficient detail to permit another researcher to repeat the research for further advancement, keeping the continuity of what has already been attained.
- 3. The procedural design of the research should be carefully planned to yield results that are as objective as possible.
- 4. The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.

Criteria of Good Research

- 5. The analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate. The validity and reliability of the data should be checked carefully.
- 6. Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.
- 7. Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity

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