Research Methdology in CSE, MTech-I (1st semester)

Chapter 1: Introduction & Overview

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Chapter 1: Topics of Study

- **Introduction:** What Is Research? Definition, Characteristics, Motivation and Objectives, Research Methods vs Methodology. Research as an integral part of professional practice. A way to gather evidence for practice. Evidence-based practice. Applications of research in practice. Development and policy formulation.

  Overview of the research process: its characteristics and requirements Types of research: Descriptive vs Analytical, Applied vs Fundamental.

  Overview of Research Designs: Quantitative vs Qualitative vs Mixed Methods Designs. Conceptual vs Empirical.

  Research Process & Methodology: The research process as an eight step model. Deciding what to research. Planning how to conduct the study. Conducting the research study. [DCJ: 4 hours]

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- In the process, this exercise creates new knowledge which is interesting/useful

What is research?...

- Research is defined as the creation of new knowledge and/or
- the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings.
- This could include (re)-synthesis and analysis of previous research to the extent that it leads to new and creative outcomes.
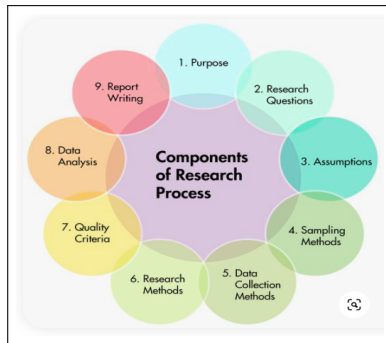

Figure: Research Process

Driving force for research: Facts or Artifacts

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        - Acceptance plan - validation by the customer

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- the new approach must create a useful artifact or improve an existing artifact

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  - that develop and test new ways that contribute to the advancement of practice and profession.

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Research Methodology

the knowledge of research methodology provides one with the techniques to find answers to research questions.

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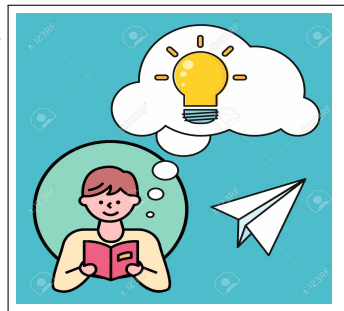

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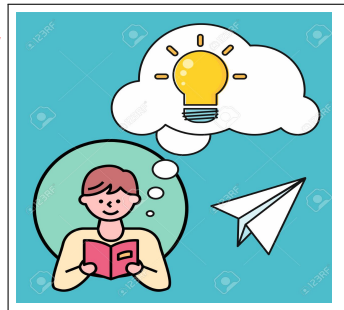
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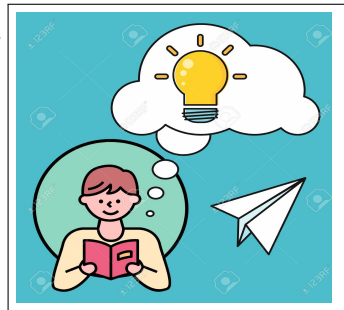
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The conclusion at the end has to be new for research

Now when one starts, the conclusion obviously is not known.... So, How does one even start?

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    - A strong guess can turn into a belief.

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The Value of Failure in Science

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Figure: `https://www.jstor.org/stable/241190721`

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  - Approach for verification, specification,..

In the next set of slides...to be continued

B l a n k