

CHAPTER 3

Research Process/

Research Proposal Development

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1. Research Process

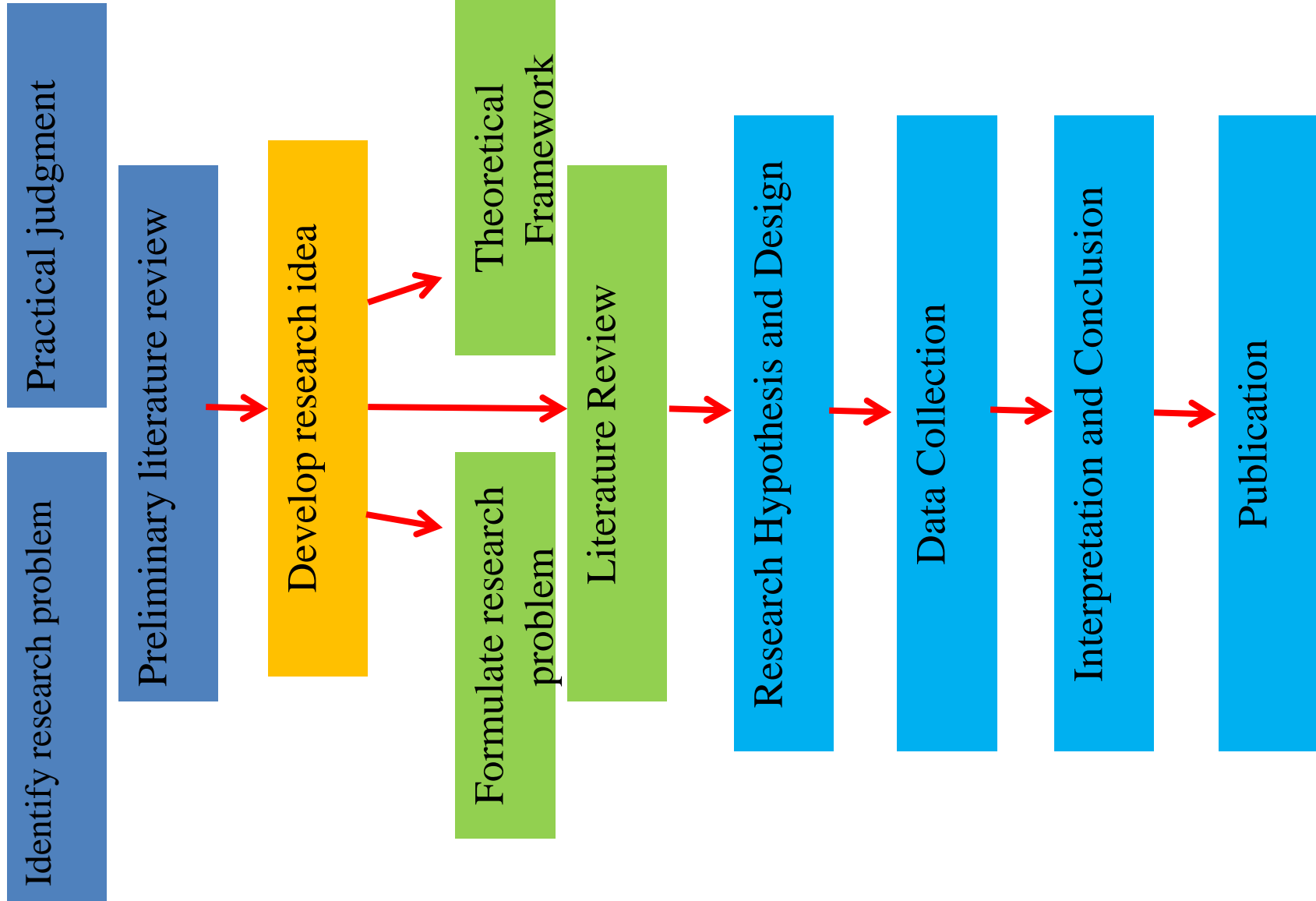
2. What is Research Proposal

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1. Research Process

Planning Research

Conducting Research



Questions you must ask?

- What is the problem and why should it be studied?
- What information is available?
- Why do we want to carry out the research? What do we hope to achieve?
- What additional data do we need to meet our research objectives?
- Who will do what and when?
- What resources do we need to carry out the study? What resources do we have?
- How will the project be administered?
- How will we present our proposal to relevant authorities etc

Steps you will take

- Selection, analysis and statement of the research problem
 - Literature review
- Formulation of research objectives
 - Research methodology
 - Work Plan
 - Budget
- Plan for project administration and utilization of results
 - Proposal Summary

2. What is Research Proposal?

- For novice researchers, research proposal preparation is the most challenging part but it is the most important aspect of the research project
- Defining the problem is the first step and one of the most difficult in research undertaking
- Criteria for selecting research topic:-
 - Relevance/Significance
 - Avoidance of duplications
 - Urgency of data needed (timeliness)
 - Feasibility of study
 - Application of results
 - Interest to the researcher
 - Ethical acceptability

- Research proposal is the detailed plan of study
- The objective in writing a proposal is to describe what you will do, why it should be done, how you will do it and what you expect
- A well-thought out and well written proposal can be evaluated based on three main criteria:-
 - Is it adequate to answer the research question(s), and achieve the study objectives?
 - Is it feasible in the particular set-up for the study?
 - Does it provide enough detail that can allow another investigator to do the study and arrive at comparable results?

3. Components of a Research Proposal

- The basic components of a research proposal which are common in many areas are :-

3.1. Title page

3.2. Summary/Abstract

3.3. Introduction/ Background

3.4. Statement of the problem

3.5. Literature review

3.6. Hypothesis/ Question

3.7. Conceptual framework

3.8. Objective/ Aim of the study

3.9. Research methods, materials and procedures

3.10. Work plan

3.11. Budget

3.12. References

3.13. Appendices/Annexes

3.1. Title page

- The title of the research proposal:-
 - should state your topic exactly in the smallest possible number of words
 - is a label not a sentence
 - Almost never contain abbreviations
- The title page:-
 - Contain name of the researcher, name of affiliations, advisor and date of delivery
 - Has no page number and it is counted in any page numbering

3.2. Summary/ Abstract

- It is a one page brief summary of the research proposal
- It should include
 - Purpose of the research
 - Materials and Methods of the research
 - Expected results
- Don'ts
 - Do not put information in the abstract that is not in the main text of your research proposal
 - Do not put references, figures or tables in the abstract

3.3. Introduction/ Background

- Provides readers with the background information for the research proposal
- It should cite those who had the idea(s) first and should also cite those who have done the most recent and relevant work.
- It should address the following points:-
 - Should focus on the research topic
 - Explain the scope of the research work (what will and will not be included)
 - Sufficient references

3.4. Statement of the Problem

- Research proposals are considered as a responses to a problem
- Researchers should deal with a problem to which answers have not been found upto the present.
- The problem statement describes the context for the study and identifies the general analysis approach.
- Effective problem statements answer the question “Why does this research need to be conducted”
- A well articulated statement of the problem establishes a foundation for everything to follow in the research process

3.5. Literature Review

- Is a description of literature relevant to a particular topic or field
- Defining the research problem determines the scope of the literature review
- Date of publication (recently published) materials are highly recommended
- Relevant literature/ materials may include:-
 - ✓ Primarily, published articles on peer reviewed Scientific Journals or Conference Proceedings
 - ✓ MSc Theses and PhD dissertation
 - ✓ Books (limited to selected textbooks handbooks)
 - ✓ Commercial reports and statistical information
 - ✓ Government reports
 - ✓ Historical records
 - etc

– Literature review can be organized:-

1. Introduction

- Define the topic together with your reason for selecting the topic
- Point out overall trends, gaps, particular themes etc

2. Body-the discussion of the sources and can be organized as:-

- Chronologically-shows changes over time but has little importance
- Thematically- based on particular themes
- Methodologically-research approach (qualitative versus quantitative)

3. Conclusion-

- summarize the major contributions, evaluating the current position and pointing out flaws in methodology and identify gaps in the research for further study

Exercises 3-1

- Evaluate the given research topics and write your comments

- What is the difference between introduction and literature review?

3.6. Questions and/or Hypothesis

3.6.1. Research Question

- Should be stated as a question
- Should involve the relationship or difference between two or more variables (i.e., an independent and a dependent variables)
- Relate to the research literature and a problem to be solved
- Serves to provide an overall focus
- Lead into specific, testable hypothesis

Example:-

- What is the relationship between alloy steel and surface damage?

How to evaluate a research question?

- a) Are they testable or researchable?
- b) Not too broad or too narrow

3.6.2. Research Hypotheses

- A clear, testable statement, not a question
- It is directional –concise and to the point
- Each hypothesis should be able to be tested via one analysis (or set of related analysis)
- Identifies specific relationships between variables
- It is a kind of like theory (but it is not a theory), an idea with supporting details that uses proven science

Example:-

– Research question

- What is the relationship between hardness of alloy steel and surface damage?

– Research hypotheses

- a) There is positive relationship between hardness and surface damage
- b) As hardness increases, surface damage decreases
- c) High hardness causes surface damage to decrease

3.7. Conceptual framework

- Described as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure subsequent presentations
- The framework is a research tool intended to assist a researcher to develop awareness and understanding of the situation under study

3.8 Objective/ Aim of the study

- the aim which the researcher seeks to bring about as a result of completing the research work
- Is either a solution to a problem a step along the way toward achieving a solution
- Objective should be
 - ✓ Simple (not complex)
 - ✓ Specific (not vague)
 - ✓ Stated in advance (not after the research is done)
- Classification of research objectives
 - General objective:-
 - General statement specifying the desired outcome
 - Specific objectives:-
 - Specific statement (in measurable terms)
 - Addresses the various aspects of the problem

3.9 Methods, material and procedure

- Is the heart of the research proposal (dictates what new data you need and how you are going to collect and process the data)
- The research methods includes:-
 - ✓ Information to allow the reader to assess the believability of the approach
 - ✓ Description of research materials, procedures and theory
 - ✓ Calculations, technique, procedure equipment etc
 - ✓ Limitations, assumptions and range of validity
 - ✓ Descriptions of your analytical methods, including reference to any specialized statistical software

3.10 Work plan

- Is a is a schedule, chart or graph that summarizes the different components of a research proposal and how they will be implemented in a coherent way in a given time
- The work plan includes:-
 - ✓ The task to be performed
 - ✓ When and where the tasks will be performed
 - ✓ Who will perform the tasks
 - ✓ The plan of assessing the ongoing progress
 - ✓ How each project activity is to be measured in terms of completion
 - ✓ Good thesis work plan enables both investigators and the advisors to monitor project progress and provide timely feedback for research modification or adjustment

3.11 Budget and funding

- Generally, researchers are required to secure funds from a funding organization to cover the cost of conducting a research project
- A proposal budget reflects direct and indirect cost
- Direct cost
 - ✓ personal
 - ✓ Consumable supplies
 - ✓ Equipments
 - ✓ Travel
 - ✓ Communication
 - ✓ Publication
- Indirect costs
 - ✓ Overhead costs for institutions or associations
 - ✓ General administrative cost
 - ✓ Operational and maintenance
 - ✓ Depreciation and use allowance

3.12 References

- References must be given to all the information that the researcher obtain from articles, journals, books
- References may be made in the main text using index numbers in brackets (Vancouver style) or authors name (Harvard style)
- The information given in the reference list must be enough for readers to find the books and papers in a library or database
- For a journal paper
 - ✓ The names of the authors
 - ✓ The year of publication
 - ✓ Title of the paper
 - ✓ Title of the journal
 - ✓ Volume number of the journal
 - ✓ The first and last page numbers of the paper
- For a book
 - ✓ The names of the author(s)
 - ✓ The year of publication
 - ✓ Title and the edition number
 - ✓ Name of the publisher
 - ✓ Page number for the reference

Exercises 3-2

- Evaluate the Research Objectives (General and specific) of the given research proposal
- Identify the research methods, materials, conditions and procedures of the given experimental research
- Can a website or Wikipedia be a reliable source as a reference?

Project 1

1. Prepare a complete research proposal in your field of specialization.
 - ✓ Select research topic in your area of interest and submit a report
 - ✓ Review relevant literatures to the proposed topic , identify the gaps and submit a report
 - ✓ Make sure that all components of a research proposal are included

