



برنامج مهارات البحث العلمي التاسع

How to write a Research **Proposal**

RESEARCH PROPOSAL

*“is like a blue print of a building plan
before the construction starts”*

Writing a formal research proposal should be started by the time one has decided on the topic for the study

A postgraduate research proposal should

- Clearly define the topic you're interested in and show you understand your research area
- Show you identified and developed an original and interesting research question
- Demonstrate you understand how to conduct research
- Look professional – it should be typed, in good English, well-structured with suitable headings and clear and legible
- Include a bibliography, listing the books and, articles

What should a research proposal contain?

- An introduction to the proposal
- Identify the subject for research in terms of theoretical issues and relevant applications
- A review of relevant literature and theories relating to your proposed research area
- Research methods you will use and the form and location
- Where and for how long might you collect any relevant data?
- Outline the sources of information you might need
- Geographical area in which the study will take place
- What are the advantages and disadvantages of this choice?

What is Research?

“A systematic investigation into a subject in order to discover facts and principles”.

- Research refers to a search for knowledge
- Research means a scientific and systematic search for relevant information on a specific topic
- The purpose of research is to discover answers to questions through the application of scientific procedures

- Writing a research proposal is both science and art
- A good research proposal is based on scientific facts and on the art of clear communication

Some Basics

- Why write a proposal?
- Approval
- Funding
- Refine ideas/methods
- Who is the audience?

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- Different from a research paper
- No analyzed data/or results

Components

- Research Question
- Introduction
- Importance
- Current knowledge
- Hypothesis
- Rationale

- Method
- Design
- Sample
- Materials
- Procedure

Components

- Data Analysis
 - What scores/data will be used
 - What tests used for analysis
 - Expected pattern of results
- Discussion
 - Restate expected outcome
 - If Results consistent with expectations
 - If Results not consistent with expectations
- Conclusion
 - Potential implications of results

Outlines

- Cover Page
- Table of Contents
- Title
- Abstract
- Introduction /Background
- Objective
- Literature Review
- Methods
- Significance

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- Common Mistake in Proposal Writing

Cover Page

- The cover page must contain:
- The name of the student, if it is a team work then the names of the team members.
- The name of instructor
- Affiliated University
- Date of Submission
- Title of Research

Table of Contents

- This should guide the reader where to find the specific pages of the project.
- Number the pages of the research paper make sure to number all diagrams, tables, accurately

Title:

- An effective title attracts the reader's interest.
- Should be precise, specific and descriptive

Abstract

- Need one page (150-200 words) abstract of the research proposal. It should be short precise and complete. The abstract of Biological Research must in brief contain the following points
 - - Background
 - - Aim of the Research
 - - Methods used
 - - Results
 - - Conclusion of the research experiment

Introduction:

- The introduction begins with a general statement of the problem area
- With a focus on research problems to be followed by the
- Rationale/Justification for the proposed study.
- should stress on the research problem, which is often referred as purpose of the study
- Begin the research with A DESCRIPTION OF THE PROBLEM or THESIS STATEMENT
- States the Research Questions, its importance
- Major problems and sub problems to be addressed by research
- Identify key dependent and independent variables
- Set the delimitations of your proposed research
- Presents rationale of the proposed study and indicate why it is worth doing.

Background Information:

- Identification of Problem
- Economic Importance
- Geographical situation (Research Location)
- Environmental Condition

Objectives

- This is a very important and pivotal section and everything else in the study is centered around it
- The objective of the proposed study should be stated very clearly
- The objective stated should be specific, achievable and measurable
- Too many objectives to be avoided
- Even just one clearly stated relevant objective for a study would be good enough
- If there is more than one objective the objectives can be presented in the appropriate order of importance

Literature Review:

- It serves several important functions
- Ensures that you are not reinventing the “wheel”
- Demonstrates your knowledge of the research problem
- Your ability to evaluate relevant literature information
- Understanding of research issues related to your research question
- Convinces the reader that the research will make significant

Methods:

- The methods section is very important.
- It tells how you to plan to tackle your research problem.
- It will provide your work plan and activities necessary for
- Implementation of your research project.
- Appropriate Field design (Statistics)
- Location of experiment
- No. of experiments and replications
- Recording of data/parameters
- Dependent and Independent variables
- Statistical analysis (Graphs, Tables)
- Analysis of Variance
- Regression, Interaction

Significance:

- This a very important section
- Expected conclusion & significance of your research to society or recommendations
- Suggested future research, if any

Conclusions/Results:

- Obviously you do not have results at the proposal stage. However, you need to have some idea about what kind of data you will be collecting, and what statistical procedures will be used in order to answer your research question or test you hypothesis

Limitation of the study

- It is not possible to include ALL aspects of a particular problem.
- STATE WHAT IS NOT INCLUDED!
- A too wide area of investigation is impractical and will lead to problems.
- SPECIFY THE BOUNDARIES of your research.

Definition of terms

- Terms or concepts that you use should be defined and explained unless they are familiar or obvious.
- Refer to authoritative sources for definitions.

Literature review

- Shows that you are aware of the literature study that is required in your research area.
- Your review a substantial amount of reading materials before writing your proposal.
- Shows that you have the theoretical knowledge in your chosen research area

Common Mistakes in Proposal Writing:-

- Failure to provide the proper context to frame the research question.
- Failure to accurately present the theoretical and empirical contributions by other researchers.
- Failure to stay focused on the research question.
- Failure to develop a coherent and persuasive argument for the proposed research.
- Too much detail on minor issues, but not enough detail on major issues.
- Too much rambling going “all over the map” without a clear sense of direction.
- Too many citation lapses and incorrect references.
- Too long or too short.
- Not following “a particular “style

How to get a proposal/grant
rejected?

Title of Research Project

- Reject

- Too long and technical of a title will not gain the reviewer's attention or interest.
- Too short or broad a title will make the reviewer too critical of grant.
- Example:
 - Determining the mechanism of action of Bcl-2 family members in regulating apoptotic signaling complexes within the mitochondria leading to a cure in cancers.

Budget:

- Good
 - Give a detailed account of where you will be spending the money.
 - Approximately one third of the budget should go to supplies.
- Reject
 - Do not justify spending all the budget on personnel.

All other Operating Grants

- Good
 - Declare all operating grants.
 - Declare 0% or 100% overlap.
 - In this granting environment it is reasonable to apply from multiple sources to get funding.
- **Reject**
 - The review committee going to treat this grant as 100% overlap.

Non-Scientific Summary

- Good
 - Clearly state why this project is important.
 - Declare the impact this research will have on cancer or other diseases.
 - Give it to a non-research friend to read.
- Reject
 - Using too much technical language.
 - Do not use acronyms even if you define them.

Summary of Research Proposal

- Good
 - give a short but informative background to justify the research hypothesis and objectives.
 - State the impact, significance and innovation in this proposal.
- Reject
 - Technical and condensed phrasing of the project.
 - No clear statement of what is the purpose of this study.

Details of Research Proposal

- Goals and/or Objectives of Research
 - Good
 - This is usually one paragraph telling the reviewer everything they need to know about this research proposal.
 - This provides the opportunity to gain the reviewers interest and excitement about this proposal.
 - It should contain the background on why this research is important, hypothesis, and objectives.
 - Should state the innovation of this proposal.
 - Finally it should in a clear statement demonstrate why this project is significant and what impact it will have.

Details of Research Proposal

- **Reject**
 - No goal or objective statement at the start of the proposal.
 - Too technical and condensed will make it hard to read and understand.
 - Too short will not give the reviewer the needed information to understand the proposal.
 - Too long will make the reviewer skip to the background and makes the reviewer search for what is important.

Details of Research Proposal

- Background:
 - Good
 - Give the reviewer the needed information to understand the objectives and approaches in this proposal.
 - Structure the background to go from broad information
 - Build up the background towards answering a specific question that is unknown.

Details of Research Proposal

- Background:
 - Good
 - There should be section within the background to discuss preliminary data.
 - Connect preliminary data to background.
 - If limited preliminary data, spend time on the innovation such as using unique resources at CCMB for this proposal.

Details of Research Proposal

- Background

- Reject

- Do not expand background to unnecessary information that does not support the hypothesis.
 - Background should not exceed one third to one half of proposal.
 - No preliminary data generally negatively impacts the proposal in two ways.
 - No indication that the proposal will be feasible.
 - No indication the applicant can do the proposed work.

Details of Research Proposal

- Rationale and Hypothesis.
 - Good
 - Clearly state the hypothesis or number of hypotheses that will be addressed in the proposal.
 - Give a rationale why this hypothesis is important to investigate.
 - Reject
 - Avoid combining the two together. It could be confusing to the reviewer.
 - Too long of a hypothesis makes it hard to understand the aim of the research.

Details of Research Proposal

- Specific Aims

- Good

- Limit specific aims to 3-4.
 - Make sure controls are added to approaches taken.
 - Always give what your expected results will be.
 - Always give alternative approaches since pitfalls happen.
 - Address feasibility if you have not demonstrated that you can do the experiments proposed.

Details of Research Proposal

- Specific Aims:
 - Address innovation wherever possible.
 - Justify the use of specific reagents or animal models.
 - For example:
 - If you use a cell line why that cell line
 - If you use an animal model why that animal model.
 - Confirm results with multiple approaches.

Details of Research Proposal

- Specific Aims
 - Reject
 - Many specific aims is bad. This is a two year proposal and if it is too ambitious, will negatively impact on reviewers.
 - Avoid to many specifics on experiments.

Details of Research Proposal

- Significance and Impact:
 - Good
 - Last chance to impress the reviewer on the importance of what you are proposing.
 - Give a sense of future directions for this research.
 - Why is this proposal innovative?
 - Impact on the field and/or on the disease being studied should be stated.
 - Reject
 - No significance statement.
 - Superficial such as this will cure a disease.

Applicant's CV details:

- Good
 - List all awards especially awards directly related to your research.
 - List all publications in the last five years.
 - Abstracts are an easy way to show productivity.
 - Give impact factors for publications and citations if any.
 - Give ranking of journal in your field of research if possible.
- Reject
 - No evidence of research activity or track record.
 - All middle authors for publications.

General Thoughts

- Reviewers will not be experts in your field of research. Make the proposal accessible to them.
- **Get your proposal read by a colleague or someone in your area of research. They might find problems that reviewers will find.**
- Plagiarism check!!

Thanks!

