



Research Methodology

Chapter 4 Proposal

Why proposal?

The purpose of research proposal is to convince the assessor that you know the previous work on the subject and that you have a workable plan to proceed the project. You should relate the work that have not been done in the past (from literature review) to the problem statement (research problem-what is not known)

The need for a Research Proposal

You need to start from an approved proposal. You may already have a completed research proposal in which case you can use this as your basis for the thesis/dissertation writing.

- If you do not have a research proposal, you need to work out and develop a suitable proposal to meet the academic requirements of your university. The research proposal will act as a main guide and structure for your research thesis/dissertation. Upon completing the research proposal, you can then look at developing your thesis/dissertation based on the approved research proposal.

Research proposal

- Remember Pareto analysis? The 80/20 rule. In principle it means: spend 80% of your time on planning for a good research proposal and outline of your thesis/dissertation and spend 20% of your time on thesis writing. With a good proposal, planning and outline of your thesis/dissertation you will be able to reduce rewriting greatly. Otherwise you will effectively end up writing, rewriting and rewriting if you spend only 20% of time planning and 80% time for writing. Rewriting is most painful as you do not know where the changes are and how many places the change affects in the entire thesis.

What is pareto analysis: 20/80 rule

- Remember to spend

80% planning

20% writing

How to use the tool

- Step 1: Identify and List Problems
- Firstly, write a list of all of the problems that you need to resolve. Where possible, talk to clients and team members to get their input, and draw on surveys, helpdesk logs and suchlike, where these are available.
- Step 2: Identify the Root Cause of Each Problem
- For each problem, identify its fundamental cause. (Techniques such as Brainstorming, the 5 Whys, Cause and Effect Analysis, and Root Cause Analysis will help with this.)

Con't

- Step 3: Score Problems
- ✓ Now you need to score each problem. The scoring method you use depends on the sort of problem you're trying to solve.
- ✓ For example, if you're trying to improve profits, you might score problems on the basis of how much they are costing you. Alternatively, if you're trying to improve customer satisfaction, you might score them on the basis of the number of complaints eliminated by solving the problem.

Con't

- Step 4: Group Problems Together By Root Cause Next, group problems together by cause. For example, if three of your problems are caused by lack of staff, put these in the same group.
- Step 5: Add up the Scores for Each Group You can now add up the scores for each cause group. The group with the top score is your highest priority, and the group with the lowest score is your lowest priority.
- Step 6: Take Action Now you need to deal with the causes of your problems, dealing with your top-priority problem, or group of problems, first. Keep in mind that low scoring problems may not even be worth bothering with - solving these problems may cost you more than the solutions are worth. -

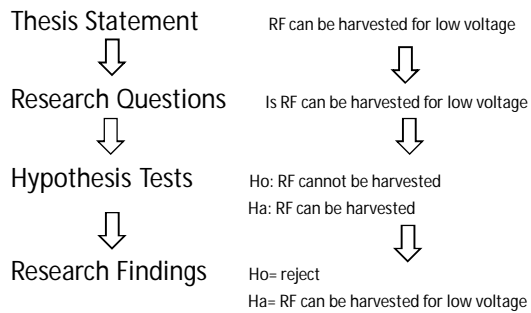
Outline of your research

- Establish thesis title
- Problem Definition
- Research Question/Statement
- Aims and Objects
- Contribution to study
- Benefits of the study

continue

- Literature Review
- Model Formation
- Research Methodology
- Data Collection
- Data Analysis
- Findings and Conclusion
- Problems and Limitations
- Reference and Bibliography
- Gantt Chart

Relationship



Title

It should be concise and descriptive. For example, the phrase, "An investigation of . . ." could be omitted. Often titles are stated in terms of a functional relationship, because such titles clearly indicate the independent and dependent variables. However, if possible, think of an informative but catchy title. An effective title not only pricks the reader's interest, but also predisposes him/her favourably towards the proposal.

Con't

- Title must reflect the objective of the thesis
- Covers the whole contents of the thesis
- Not more than 15 words

Eg

Developing RF harvester using antenna array for portable DC power supply

Reflect objective/methodology/result

Research Problem definition

- Formulating the research problem begins during the first steps of the scientific process.
- As an example, a literature review and a study of previous experiments, and research, might throw up some vague areas of interest.
- Read more: Defining a Research Problem - What exactly should you investigate?
- Many scientific researchers look at an area where a previous researcher generated some interesting results, but never followed up. It could be an interesting area of research, which nobody else has fully explored.

- A scientist may even review a successful experiment, disagree with the results, the tests used, or the methodology, and decide to refine the research process, retesting the hypothesis.
- This is called the conceptual definition, and is an overall view of the problem. A science report will generally begin with an overview of the previous research and real-world observations. The researcher will then state how this led to defining a research problem.

Research problems

- A.The need to communicate what will be studied in clear, concise, and unambiguous terms
- B.One or more sentences indicating the goal, purpose, or overall direction of the study
- C.General characteristics
- 1.Implies the possibility of empirical investigation
- 2.Identifies a need for the research
- 3.Provides focus
- 4.Provides a concise overview of the research

Two ways of stating the problem

- 1.Research problems: typically a rather general overview of the problem with just enough information about the scope and purpose of the study to provide an initial understanding of the research
- 2.Research statements and/or questions: more specific, focused statements and questions that communicate in greater detail the nature of the study

3.Examples

- a.General research problem
- 1.The purpose of this study is to investigate the attitudes of high school students to mandated drug testing programs
- b.Statements and questions
- 1.This study examines the differences between males' and females' attitudes toward mandated high school drug testing programs.
- 2.What are the differences between freshmen, sophomore, junior, and senior students' attitudes toward mandated high school drug testing programs?

Researchable and non-researchable problems

- 1.Researchable problems imply the possibility of empirical investigation
- a.What are the achievement and social skill differences between children attending an academically or socially oriented pre-school program?
- b.What is the relationship between teachers' knowledge of assessment methods and their use of them?
- 2.Non-researchable problems include explanations of how to do something, vague propositions, and value-based concerns
- a.Is democracy a good form of government?
- b.Should values clarification be taught in public schools?
- c.Can crime be prevented?
- d.Should physical education classes be dropped from the high school curriculum?

Comparing quantitative and qualitative research problems

- 1.Quantitative problems
- a.Specific
- b.Closed
- c.Static
- d.Outcome oriented
- e.Use of variables
- 2.Qualitative problems
- a.General
- b.Open
- c.Evolving
- d.Process oriented

Sources of research problems

1. Casual observation
 - a. The relationships between the cognitive and affective realms
 - b. The effect of positive and negative reinforcement
2. Deductions from theory
 - a. Use of math manipulatives
 - b. Learning and instructional style congruence
3. Related literature
 - a. The use of math manipulatives in secondary schools
 - b. The comparison of state and national dropout profiles
4. Current social and political issues
 - a. Gender and race equity
 - b. Inclusion policies

5. Practical situations
 - a. Evaluating a specific instructional program
 - b. Evaluating a specific school restructuring effort
6. Personal interests and experience
 - a. Teaching statistics from an applied perspective
 - b. Effectiveness of non-threatening classroom assessments
7. Replication of previous studies
 - a. Checking the findings of a major study
 - b. Checking the validity of research findings with different subjects
 - c. Checking trends or changes over time
 - d. Checking important findings using different methodologies

Clarification of contradictory research results

Quantitative research problems

Three types of questions

1. Descriptive
2. Relational
3. Causal

Identifies specifically the type of research, the variables and relationships between them, and the subjects

Variables

A variable is a label or name that represents a concept or characteristic that varies (e.g., gender, weight, achievement, attitudes toward inclusion, etc.)

Conceptual and operational definitions of variables

Conceptual (i.e., constitutive)

- a. definition uses words or concepts to define a variable
- Achievement: what one has learned from formal instruction
 - Aptitude: one's capability for performing a particular task or skill
- b. Operational definition is an indication of the meaning of a variable through the specification of the manner by which it is measured, categorized, or controlled
- Weschler IQ score
 - Income levels below and above \$45,000 per year
 - Use of holistic or phonetic language instruction

Types of variables

- a. Three variable labels defined by the context within which the variable is discussed
- Independent and dependent variables
 - Extraneous and confounding variables
 - Continuous and categorical variables
- b. Independent and dependent (i.e., cause and effect)
- 1. Independent variables act as the "cause" in that they precede, influence, and predict the dependent variable
 - 2. Dependent variables act as the effect in that they change as a result of being influenced by an independent variable

Examples

- a. The effect of two instructional approaches (independent variable) on student achievement (dependent variable)
- b. The use of SAT scores (independent variable) to predict freshman grade point averages (dependent variable)
- 4. Some situations do not lend themselves to the use of the terms independent or dependent because it is difficult to discuss them in causal terms
- a. The relationship between attitude and achievement, that is, do positive attitudes cause high achievement or does high achievement cause positive attitudes?
- b. The relationship between creativity and critical thinking, that is, do high levels of creativity cause higher levels of critical thinking or do higher levels of critical thinking cause greater creativity?

Extraneous and confounding variables

Extraneous variables are those that affect the dependent variable but are not controlled adequately by the researcher

- a. Not controlling for the socio-economic status of students involved in a study of the effects of instructional technologies
- b. Not controlling for the key-boarding skills of students in a study of computer-assisted instruction

Confounding variables are those that vary systematically with the independent variable and exert influence of the dependent variable

- a. Not using counselors with similar levels of experience in a study comparing the effectiveness of two counseling approaches
- b. Not using the same test to measure the effectiveness of two instructional approaches

Research Question

- From research problem you can ask the question what do you want to solve.
- Solution to a research problem lets you focus your work and bring it to an appropriate end.
- When stating a research problem, you list the topic, the question and the rationale. The consequences you list in the rationale statement reveal whether you are doing pure research or applied research.
 - In pure research, the consequences are conceptual and the rationale defines what you want to know.
 - In applied research, the consequences are tangible and the rationale defines what you want to do.

Objective

- To develop.....
- To design.....
- To model.....
- To validate.....
- To proof.....
- To characterize

Avoid "to investigate... " "to study.."

Contribution/benefits of study

- New knowledge
- New method or procedure
- New technology
- New application
- Upgrade social life
- Toward sustainable
-

Write your Research Proposal

3 major elements

- Introduction
- Literature Review (or Background)
- Procedure (or Methodology)
 - Others
- Expected result
- Discussion
- Gantt chart

Introduction

The "Introduction" tells the reader

- 1) what the project is about,
- 2) why the project is worth doing, and
- 3) why the project is a good topic for fulfilling the objectives of the research requirement.

Also the Introduction must also state clearly and completely the specific objectives of the project

INTRODUCTION- CON'T

1. State the research problem, which is often referred to as the purpose of the study.
2. Provide the context and set the stage for your research question in such a way as to show its necessity and importance.
3. Present the rationale of your proposed study and clearly indicate why it is worth doing.
4. Briefly describe the major issues and sub-problems to be addressed by your research.

5. Identify the key independent and dependent variables of your experiment. Alternatively, specify the phenomenon you want to study.
6. State your hypothesis or theory, if any. For exploratory or phenomenological research, you may not have any hypotheses. (Please do not confuse the hypothesis with the statistical null hypothesis.)
7. Set the delimitation or boundaries of your proposed research in order to provide a clear focus.
8. Provide definitions of key concepts. (This is optional.)

Some questions to cover here are:

- What is the project subject?
- What are the goals of the project? the sub-goals?
- How will the results be used?
- What is the general method or procedure being used to conduct the project?

Format

- Problem statement
- Objectives
- Scope of study

Literature Review (or Background)

- What kinds of research have been done before (including previous which can be accessed through the reference desk at the library)?
- What relevant kinds of studies or techniques need to be mastered to do the project?
- Where is the state of the art today?
- How have others gone about trying to solve problems the project team wants to tackle, and in what ways will their approach build on and vary from previous work?

Literature review -Cont't

- 1. Ensures that you are not "reinventing the wheel".
- 2. Gives credits to those who have laid the groundwork for your research.
- 3. Demonstrates your knowledge of the research problem.
- 4. Demonstrates your understanding of the theoretical and research issues related to your research question.

5. Shows your ability to critically evaluate relevant literature information.
6. Indicates your ability to integrate and synthesize the existing literature.
7. Provides new theoretical insights or develops a new model as the conceptual framework for your research.
8. Convinces your reader that your proposed research will make a significant and substantial contribution to the literature (i.e., resolving an important theoretical issue or filling a major gap in the literature).

literature reviews suffer from the following problems

- Lacking organization and structure
- Lacking focus, unity and coherence (clear & logic)
- Being repetitive and verbose (using too many words)
- Failing to cite influential papers
- Failing to keep up with recent developments
- Failing to critically evaluate cited papers
- Citing irrelevant or trivial references
- Depending too much on secondary sources

Methodology

- The Method section is very important because it tells your Research Committee how you plan to tackle your research problem. It will provide your work plan and describe the activities necessary for the completion of your project.
- Must be sufficient information
- Appropriate and valid way to address your research
- Elaborate for qualitative and quantitative research

The methodology section typically consists of the following

Quantitative studies

- ▶ Design -Is it a questionnaire study or a laboratory experiment? What kind of design do you choose?
- ▶ Subjects or participants - Who will take part in your study? What kind of sampling procedure do you use?
- ▶ Instruments - What kind of measuring instruments or questionnaires do you use? Why do you choose them? Are they valid and reliable?
- ▶ Procedure - How do you plan to carry out your study? What activities are involved? How long does it take?

Some of the other questions the reader will expect to be answered in this section are:

- What are the tasks and sub-tasks identified to achieve the objectives?
- What materials will be needed to carry out the project: equipment? computer support? typing? graphics? others?
- 'What data are needed for the project and how will they be collected? If the project requires a survey or interviews, the design of this instrument (especially the selection of participants) must be explained and justified.

Con't

- What method or process will be used to analyze this data and where else (if anywhere) has this method or process been used?
- What time frame will be needed to accomplish the identified tasks or sub tasks? Project schedules may be presented in standard forms like PERT or Task Charts?
- If working in a team, which teammates will accomplish which sections?
- What costs is the project anticipated to incur--in other words, what is the budget? (A Budget Summary Request Form must be submitted

Other things should be consider

Expected 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.

Discussion:

It is important to convince your reader of the potential impact of your proposed research. You need to communicate a sense of enthusiasm and confidence without exaggerating the merits of your proposal. That is why you also need to mention the limitations and weaknesses of the proposed research, which may be justified by time and financial constraints as well as by the early developmental stage of your research area.

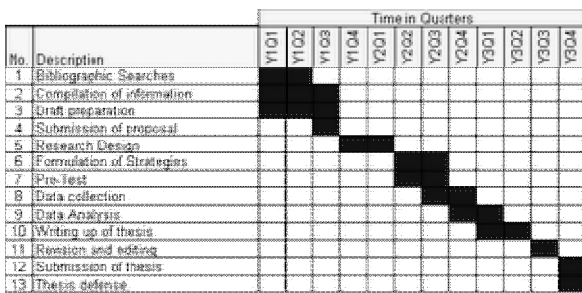
Common Mistakes in Proposal Writing

- ▶ Failure to provide the proper context to frame the research question.
- ▶ Failure to delimit the boundary conditions for your research.
- ▶ Failure to cite landmark studies.
- ▶ 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.

Con't

- ▶ 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. (The best proposals move forward with ease and grace like a seamless river.)
- ▶ Too many citation lapses and incorrect references.
- ▶ Too long or too short.
- ▶ Failing to follow the APA style.
- ▶ Slopping writing.

Develop Gantt Chart for your Research Proposal



- **Avoid**

- Broad research areas which would be unmanageable as a PhD topic or that have no relevance to the University of Warwick research areas.

- Vague descriptions of your research interests.
