



Best practice guidelines

WASP (Write a Scientific Paper): Writing an academic research proposal



ARTICLE INFO

Keywords:

Research proposal

Thesis

Human subjects

ABSTRACT

A research study cannot commence without a proposal. This paper highlights the preparatory steps and details the individual sections of a research proposal. The importance of the proposal toward the research project and the eventual writing of a thesis or dissertation is also emphasised. The implications of using human subjects are also discussed.

1. Introduction

For the novel researcher in academia, preparing a proposal can be quite a daunting task since it requires focusing one's thoughts and composing a plan of action for the research. This ultimately means committing to a research topic and pathway. Most certainly writing a research proposal is the start of a journey that may take a different course than planned. However the crucial goal is to start off with a road map of what it is that you actually intend to do.

This paper will highlight some important facets with regard to creating a research proposal and is by no means exhaustive of the topic. Readers are also advised to access institutional guidelines that will further help them prepare the necessary documentation.

The first step before one embarks on writing the proposal is for the researcher to actually establish what type of proposal is expected and for whom it is intended. Knowing your audience base is of paramount importance since it will establish the writing style necessary for a scientific or lay audience.

Broadly speaking there are two types of proposals to be considered: the thesis proposal and/or research grant proposal. This step, although seemingly trivial, is a very important step since it will establish the narrative of the document. The thesis proposal will be more of an academic style that comprises a short version of the dissertation to follow. On the other hand, the research grant proposal will reflect closely the content of the thesis proposal but more emphasis will be assigned to particular elements such as timeframes and detailed costing of the project itself.

Therefore, once the rationale of the proposal is established, the researcher can proceed with the writing. Preparing to start writing a research proposal requires serious thought and introspection on the project. It is not a bad idea to bounce ideas off colleagues and your supervisor. Discussion will help the researcher focus and establish the feasibility of one's plans. Sometimes it will also provide you with an alternative approach on the project and help you steer your research plans.

A research proposal should contain all the key elements involved in designing the study, with appropriate material that allows readers to assess the validity and utility of the planned study. Organising a detailed and appropriate research proposal will help the researcher later

on when writing the thesis, since the proposal can be considered to be a preliminary version of the final research thesis. Truly, the time spent on the research proposal is time well spent and will facilitate later on the writing of the dissertation.

On the other hand, if what is expected of you is a research grant proposal, then the completed document should be prepared differently and more emphasis should be placed on the methodology and requirements needed to complete the research. This obviously does not negate the need for the scientific basis for the project, however more emphasis should be directed in line with the objectives of the research grant proposal. Irrespective of the proposal being prepared the researcher should dwell on the following questions:

1. What are the aims of the research proposal?

The aim/s of a research proposal is to present and substantiate the need to study the research problem at hand. The proposal presents the practical ways in which the projected study will be accomplished. In addition it is used to communicate the researcher's intent to the ethics committees and/or grant funding agencies before the authorisation or monies are awarded. Different schools, departments or faculties will have standards and guidelines of what should be included as design elements and procedures for conducting the research. Evidently these would be predominantly geared towards the discipline in which the problem itself may reside. Therefore guidelines for research proposals can be more exacting and should be established with the appropriate authority earlier on so that the researcher can focus their efforts on those directions.

2. What are the sections of the research proposal?**I. Title of Research Project:**

On the first page of the research proposal, it is imperative to state the names and titles of the principal researcher, supervisor(s), their professional qualifications and contact information.

The title of the research proposal can be considered to be one of the most important elements of the write-up. It identifies the research question, which must be clearly articulated since it underpins the entire

project including the selection of an appropriate research methodology.

The title is definitely the first part of the paper to be read and therefore should be engaging since it is the first impression of your proposal. It therefore must define lucidly the purpose and scope of the research study in a concise, precise and interesting fashion. Failure to be succinct can lead to disinterest and may detract from the proposal itself. A good title should provide information about the focus of your research study. Typically the title should include three elements that are tightly related to the objectives of the study. The title should include:

- The Population or item/material under investigation,
- The Intervention,
- The Outcome.

The order these three elements are organised depend on the research itself and the sequence may be moved around. Alternatively the title may describe the methods used to study the problem. It is important to present a consistent title throughout all of the related documents; this includes the proposal itself, the ethics and grant application and all associated appendices, forms, questionnaires etc.

II. Introduction and Literature Review

The research proposal should include an introduction and literature review. The introduction lays down the significance of the research problem and should provide your reader with an understanding of how the researcher intends to tackle it. It is pertinent to provide some background to the problem and how you will conduct your research.

The length of the review should be decided a priori. It can be an extensive one if it is permissible. As stated previously the more work done at the stage, the more the researcher will gain later on when it comes to writing the actual literature review for the thesis. Irrespective of its length, the literature review critically appraises previous research in the field and must provide convincing evidence that a demand exists for the proposed study. One should identify clearly what is already known and also the lacunae in the particular field of research. Indeed this section of the proposal (and eventual thesis) should conclude with the statement of a problem/s; that is what the issues are and why they deserve to be investigated. This is a justification that communicates the link between the research question and its relationship to advancing the literature and improving professional practice.

Needless to state, this section relating to the statement of the problem should be a very brief overview of the literature review and be presented in an engaging fashion.

It is not uncommon that at this stage a researcher would have refined or sometimes modified the original plans of research, in an effort to encapsulate the findings of the readings.

III. Objectives and Null Hypotheses

In the next section the objectives and null hypotheses of the study are usually presented. They should be tightly linked to the previous section outlining the statement/s of the problem, as well as to the ensuing hypotheses. Frequently, the number of objectives and hypotheses will be similar. A common pitfall at this stage is to not link the objectives and hypotheses together. This can look disorganised, may diminish the overall standing of the research and open the work to criticism.

IV. Methodology

Several research methods may be followed, all of which have distinct characteristics. The choice of methodology selected by the researcher is truly dependent upon the style of the research question. In other words, the researcher's selection of an appropriate research methodology is dependent on the research question itself and how best it is addressed.

Therefore the methodology section is an important aspect of a research proposal and eventually of the thesis/dissertation itself. In this section the author will clearly outline how the data will be collected and finally how it will be analyzed. The design and methods should be described in sufficient detail to allow an external evaluator to estimate the workload and if the timeline/schedule is achievable. The writing should always be written in the future tense.

V. Materials

There should be a clear description of the materials or subjects being used for the study. Specific elements of the data collection instruments (questionnaires, medical histories, interviews, observations and equipment) should be identified and their intended plan of use outlined. The rationale for their selections should be provided.

This is very important to:

- 1) Validate the research outcomes, by allowing other research to reproduce or replicate the study (one of the tenets of science),
- 2) Specify how the ethical and/or data protection requirements of engaging human or animal subjects are being safeguarded (see below) and.
- 3) Allow applicability of the research findings of your study to other future researchers and/or to evidence-based clinical practice approach.

Recruitment of human subjects:

The researcher should define how and why the subjects would be recruited in great detail. Academic and/or other institutions will typically provide strict guidelines on the relevant information required and readers are advised to follow them rigorously. Typically, this includes the following:

- Relevant **characteristics** of the subjects and their numbers (which should be generated by using the appropriate sample size calculations based on your expected outcome and the evidence in the literature),
- A clear description of **sampling methods** and **inclusion/exclusion criteria**,
- Any institutional **permission** required for the research,
- **Subject information packages**. This outlines the research and what the subjects' participation will involve and what their rights are. Any risks or potential of harm, as well as benefits, should be provided in unequivocal layman's terms. This document should also provide a description of the information to be gathered and how it will be stored and for how long. Data protection law may restrict the circulation and storage of information beyond a certain period and the researcher should state it clearly.

The subjects' personal information (such as names, addresses and identification numbers) or and other data that may identify them, should not be collected, unless it is needed for follow-up visits. If indeed it is required then the researcher should state so and provide the rationale for collecting it. In the latter case, a coding system for human subjects is generated for identification purposes during the research phase. However the data itself will be analysed without identifying the subjects. This process is referred to as pseudonymization. Depending on the type of research and also the level of studies, the coding "key" will be stored by the primary researcher or by the supervisor (typically for undergraduate research). This information should be stated in the subject information package as well as the consent form.

Also identify the researcher and supervisor/s and provide contact details (institution or personal numbers and emails).

Typically the subject information package is prepared as a separate document and it would not be unreasonable to have it ready with your research proposal,

- **Details of the information** to be gathered and copies of relevant documents/questionnaires to be utilised. The researcher should be careful to be within the parameters of data protection and if possible to avoid unnecessary collection of data. If on the other hand, certain details are necessary (for example subject identification numbers), then the researcher should justify their collection,
- **Timeline** of the observations and how long their participation will be,
- **Data access:** Who will be able to access the data after its collection, how long it will be stored for and how subject identity will be protected,
- **Subjects' consent form** clearly outlining their legal rights and obligations. If subjects are minors, mentally infirm, or otherwise not legally competent to consent to participation, the document should specify how their approval (assent) will be obtained and from who is proxy consent obtained. Typically institutions will provide strict guidelines on how to approach these specific subjects. The consent form should also contain details discussed previously under the subject information package. This includes the data collection process, their identification or else the pseudonymization process, how long the information will be stored and who will have access to it. Additionally under data protection law, subjects have the right to access and can request the removal of data that could potentially identify them. Subjects are also entitled to a copy of the signed consent.

VI. Methods

Likewise the methods section should describe the steps that will be used to investigate the research problem and the justification for the application of specific actions or techniques used, thus permitting the reader to critically evaluate the study's overall validity and reliability. Consequently this section should also be corroborated with evidence of previous research supporting the techniques used. The methodology may include quantitative and/or qualitative approaches [1].

The methodology section may sometimes also include the timeframes and costs involved. This requirement should be established from the onset. This information will help the reader establish the feasibility of the project and outline the resources required for the research. Resources will include the human, logistic and financial ones. The level of details will depend on the guidelines and whether this is a research grant proposal. Typically, for the latter, detailed and structured information will be requested by the awarding agency or institution.

VII. Statistical Analysis

A brief discussion of the proposed data analysis is warranted. The provision of the expected statistical tests to be used will help the researcher organise further not only thought process but also how to organise the data collection and inputting sheets. The researcher should keep in mind that these inputting sheets should be prepared with the statistical analysis meant to follow data collection in mind. Many times students embark on research, collect the data and then fail to organise it appropriately for analysis, thereby wasting precious time.

VIII. Conclusion

The conclusion restates the significance of your proposal and provides a brief outline of the entire study. This brief section should emphasize why the research problem is worth investigating, anticipated outcomes and/or benefits, and how it should advance existing knowledge in the field.

IX. References and Bibliography

At the end a reference list is required using the recommended

referencing formatting which should be used throughout the proposal. This is necessary to:

1. Identify and attribute the cited material to their rightful author, thereby avoiding plagiarism,
2. Highlight the notion that the researcher has indeed conducted a thorough review of the literature. This allows an appraisal of the work,
3. Reinforce the researcher's arguments on the planned research. Coincidentally it offers the chance to obtain further evidence about the research topic.

X. Additional Information

Any appendices with relevant additional material, such as consent forms, questionnaires etc. should be added and annotated. The researcher is reminded that all these documents may need to be in different languages if the country where the research is being conducted is multilingual.

Ethics, including ethics of dealing with colleagues, as well as data protection, will be the topics in a future set of Best Practice Guidelines in these WASP (Write a Scientific Paper) series.

2. Conclusion

In conclusion, crafting a good research proposal is a crucial skill which will not only facilitate acceptance of a project but also the eventual write up of a paper or a thesis.

Acknowledgments

The inspiration for this series of papers arises from the international Write a Scientific Paper course (WASP – <http://www.ithams.com/wasp>) [2–3].

Conflict of interest statement

There are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

References

- [1] C.J. Hollins Martin, V. Fleming, A 15-step model for writing a research proposal, *Br. J. Midwifery* 18 (12) (2010) 791–798.
- [2] V. Grech, WASP - Write a Scientific Paper course: why and how, *J. Vis. Commun. Med.* 40 (3) (2017 Jul) 130–134, <https://doi.org/10.1080/17453054.2017.1366825> (Epub 2017 Sep 19).
- [3] V. Grech, S. Cuschieri, Write a Scientific Paper (WASP) - a career-critical skill, *Early Hum. Dev.* (2018 Jan 17) 96–97 (pii: S0378-3782(18)30005-7), <https://doi.org/10.1016/j.earlhumdev.2018.01.001> ([Epub ahead of print] PMID: 29361328).

Further reading

- [other] University of South Carolina, <http://libguides.usc.edu/writingguide>.
 [other] University of Toronto, <http://advice.writing.utoronto.ca/types-of-writing/academic-proposal/>.
 [other] University of Toronto, <http://advice.writing.utoronto.ca/planning/organizing/>.
 [other] University of Malta, https://www.um.edu.mt/_data/assets/pdf_file/0007/335293/phdproposal.pdf.
 [other] https://www.um.edu.mt/_data/assets/pdf_file/0011/338942/ResearchCodeofPractice.pdf.
 [other] https://www.um.edu.mt/_data/assets/pdf_file/0009/335448/EuropeanCommissionEthicsforResearchers2013.pdf.

Nikolai Attard,
 Department of Oral Rehabilitation and Community Care, Faculty of Dental
 Surgery, University of Malta, Malta
 E-mail address: nikolai.attard@um.edu.mt