Proposal writing for grants

Prof Obinna Onwujekwe: PhD, FAMedS, FAS
Director of Research
University of Nigeria
December 2022

Objectives of the workshop

- Learn the components of a research proposal
- Learn how to craft a research proposal
- Write a skeletal proposal

Martin Luther King, Jr.

- The function of education is to teach one to think intensively and to think critically.

- **Intelligence plus character - that is the goal of true education.**

Why write a proposal?

- Generate evidence for policy making or for strategic planning
- Contribute to current conversations and debates
- Respond to a call for proposal
- For undertaking undergraduate and postgraduate projects
- To generate data for publications
- Answer critical questions bothering the scientist or researcher
- Hobby
- Etc

Movement from ideas to proposals

- Expression of interest (EOI) (response to a call for proposal)
- Expression of inquiry (EOI) (no call for proposal, but inquire whether funding is available)
- Draft proposal
- Internal peer review
- Extensive literature review

Nnamdi Azikiwe

- Originality is the essence of true scholarship. Creativity is the soul of the true scholar.

Sections of a proposal – an example

- Title
- Introduction: background/justification (rationale)
- Research questions
- Aim and objectives
- Literature review – theoretical and empirical
- Theoretical and Conceptual frameworks
- Research methods
  - Context of research
  - Study area
  - Study design
  - Sampling and sample size (inclusion and exclusion criteria)
  - Data collection tools
  - Plans for data analysis
  - Plans for research communication (research uptake strategy)
  - Ethical considerations
- Timelines
- Budgeting

Sai Baba

- A house must be built on solid foundations if it is to last. The same principle applies to man, otherwise he too will sink back into the soft ground and becomes swallowed up by the world of illusion.

The Title

- Must be sharp
- Informative
- Keep it short and simple (KISS)
- Respond directly to a call
- Should be active
- Should be focused
- ETC

Rationale/introduction/background/justification

- It provides the rationale for the study
- Why it should be funded
- Why it provides value for money
- Encompasses literature review on the subject matter
- Identifies gaps in literature and potential contributions of the study
- Provides the basis for research questions and objectives
- Provides basis for conceptual framework and research methods

Research questions

- Asks the questions that the research will answer
- Should try not to have many - not be more than four so that the research is focused
- Aim and objectives are derived from research questions
- Any examples?

Aim

- A general statement that shows the direction of the study and its contribution to knowledge
- Should be sharp and focused
- Reflect the title of the study
- Encompass the research questions
- Leads to specific objectives
- Etc

Specific objectives

- Are derived from research questions
- Linked directly to the aim
- Should be SMART
- Should not be too many – not more than five

Methods – the most important part

- Informs how the study will be undertaken
- Linked to specific objectives
  - Have a specific method for each specific objective
- What study design
  - Cross-sectional
  - Prospective
  - Retrospective
  - Primary vs secondary data
- Detail data collection methods
  - Qualitative (several methods)
  - Quantitative (several methods)
  - Mixed
  - Etc

Sample Size Determination

Very important if the study is a simple size.

This can be obtained with a formulae which are different for Qualitative and Qualitative variables.

For Quantitative variable the formula for calculating the minimum sample

$$\textbf{Size, } n = \frac{Z^2 S^2}{d^2}$$

Where n = the desired sample size

Z = The standard normal deviation usually set at 1.96 (or simply 2.0) which corresponds to the 95% confidence level.

S = Standard deviation

d = Degree of accuracy required which should be less than the level of significance.

The formula applies to a situation where the ratio of sample size to population size is small i.e. an infinite population for a finite population i.e. when the population size is ≤ 10,000

$$n = Z^2 S^2/(d^2 + Z^2 S^2/N)$$

Where the terms remain as defined earlier and N = population size.

Sample size when studying proportions with population > 10,000 ie Infinite population the minimum sample size

$$n = \frac{z^2 pq}{d^2}$$

Where n, d and z are as defined

P = the proportion in target population estimated to have a particular characteristic. This can be got from literature or pilot study if there is no reasonable estimate use 50%.

q = the proportion without the characteristic.

This can be applied to NPI

Sample size when studying proportions with population ≤ 10,000 (finite population)

If N the population size is less than 10,000 the sample size will be smaller.

Thus the minimum sample size $n = \frac{no}{1+\frac{no}{N}}$

where no is the sample size for population ≤ 10,000.

Sample size for comparison of groups.

Assume equal sample sizes for the two groups (n1 =n2 =n) in the two sub-samples, the formula for

$$n = \frac{2Z^2pq}{d^2}$$

Decision on Sampling.

- Decide on whether to draw a sample
- If yes, whether a probability or Non probability sample

Guiding factors for taking decision:

- Consider the objectives of the study
- Extent to which findings are representative of the larger population
- Cost of undertaking the study
- Time available
- Personal availability

Non-Response

To allow for possible non-response rates, an adjustments could be made to the calculate sample size.

Example, if a non-response rate of 40% is anticipated, then the sample size to be calculated could be determined by dividing the original calculated sample size by the anticipated response rate

$$n' = \frac{n}{0.4}$$

with n' as the new sample size

Sampling Procedure

There are basically two types viz:

-Probability sampling procedure

-Non-probability sampling procedure

Probability Sampling Procedure includes

-Simple random sampling which can be generated by

- ❖Computer
- ❖Table of random numbers
- ❖Basket or Bag method for small population group

In each case a sampling frame must be available. A frame is a list of the units of the population.

-Systematic random sampling used in clinic based studies and household studies

-Stratified sampling, this is used when there is a typical population characteristics to be studied and there is a need for their adequate representation.

- Cluster Area (used preferably in community studies)
Multistage sampling large scale study like Nationwide investigation)

Non-Purpose Sampling include:

-Purposive Sampling

-Judgement Sampling

-Convenient Sampling

-Quota Sampling

DATA ANALYSIS

TO Plan:

_ Refer to study objectives

- Refer to hypothesis

Preparation:

-Outline the analysis to be performed (Descriptive or analytical)

-Make dummy tables

-List the variables for each objective

Data analytic methods

- Qualitative
- Quantitative
- Triangulation
- Software packages
- Presentation of results?

Plans for research communication

- Workshops
- Meetings
- Policy briefs
- Technical reports
- Conferences
- Papers
- ETC

Ethical considerations

- Informed consent
- Ethical approval
- What else?

Time line

- What?
- When?
- How?
- Who (team building and justify roles)
- Specified time frame
- Reasonable

Martin Luther King, Jr.

- Every man must decide whether he will walk in the light of creative altruism or in the darkness of destructive selfishness.

✓ Born: January 15, 1929

✓ Died: April 4, 1968

Budget

- Tabulate
- Team building
- Justification

References

- Should be complete
- Should follow a uniform layout

Annexes

- Study tools
- As required by funders
- Any excess material that makes the proposal to be above the word/page limit
- What else?

Ignorance and stupidity.

- Nothing in the world is more dangerous than sincere ignorance and conscientious stupidity.

Sai Baba

- Life is a song - sing it.
- Life is a game - play it.
- Life is a challenge - meet it.
- Life is a dream - realize it.
- Life is a sacrifice - offer it.
- Life is love - enjoy it.