

THE PROPOSAL TEMPLATE

This document has been set up to assist students in preparing the text for their research proposal. It is NOT intended as a document to guide you through your research proposal development, but to assist you in setting out the proposal, in terms of text layout, section headings and sub-sections.

The Research Proposal is a complete description of the intended research, developed under the supervision of the assigned supervisor. Through the full proposal, the student needs to demonstrate convincingly that the study will make a contribution to a public health issue or problem. The full research proposal must be between 10 and 200 pages and should present the following:

- Title
- Brief Introduction

MANUAL
for
MASTERS' RESEARCH PROPOSAL
AND THESIS WRITING

**A THESIS PROPOSAL TO FEDERAL TVET INSTITUTE
DIVISION OF ELECTRICAL ELECTRONICS AND ICT**

(Department of Information and Communication Technology)
**IN PARTIAL FULFILLMENT FOR THE DEGREE MASTER OF
SCIENCE IN ICT**



PART I: Research Proposal

1.1 Introduction

Research in common jargon refers to a search for knowledge. It is actually a voyage to discovery. We all possess the instinct of inquisitiveness when the unknown confronts us. Our inquisitiveness makes us probe and attain full understanding of the unknown. Therefore research is one of the means people set out to understand their environment. It is a human activity based on intellectual application in the investigation of a given situation or phenomenon. Research is also a scientific process of collecting and analyzing information to enhance our understanding of a given phenomenon or a problem. It, therefore, includes the task or functions of the researcher of understanding a phenomenon and also to communicate it to others. In doing so, research must be systematic and follow series of steps.

Scientific research is a systematic attempt to obtain answers to meaningful questions about phenomena or events through scientific procedures. Such research undertakings are considered impartial, objective, empirical and logical analysis of problems which need to be investigated. In short, scientific research is a planned and a critical examination of a problem/issue under question to come up with solutions or suggestion for the future course of action. It must also be noted that any research work requires some sort of interpretation. The purpose of research is to discover answers to questions through the applications of scientific procedures.

1.2. Research Proposal

In any research undertaking, the initial task for a researcher is to identify a subject or research topic. The main criteria for selecting a research topic include:

- Relevance or significance
- The fact that it is not duplicated
- Urgency of data needed
- Feasibility of the study
- Interest of the researcher
- Ethical acceptability

After a careful identification and defining of a research problem, the plan must be written down as any research proposal should be guided by a detailed plan. Hence, a research proposal indicates a specific course of action that will be consciously followed. It helps to have full focus on the various activities to be undertaken in systematic and logical ways. It also helps one to present their research actions in a scholarly and orderly ways.

A clear and well-thought-out research proposal is considered the backbone of the research. A research proposal has got the following functions:

- Forces you to clarify your thoughts and to think about all aspects of the study under consideration
- Serves as means of obtaining ethical approval if especially the research theme and setting is on human subjects or on experimental animals
- Serves as an essential document that can be submitted for funding

In addition, a well-thought out research proposal can be judged on the following important points:

- It should be adequate to answer the research question (s) in order to achieve study objectives
- It should be feasible in the particular research set-up of the study

- It should provide enough detail that can allow another investigator to do the study and arrive at comparable results.

2 Components of a research proposal

1. Title
2. Summary/ Abstract
3. Introduction
4. Background
5. Statement of the problem
6. Conceptual framework (brief of the major concepts and theories to be used in the research)
7. Research objectives: Main objective, specific objectives
8. Research Questions/ Hypotheses
9. Significance
10. Scope: thematic, spatial, temporal
11. Description of the study area
12. Research Methods and procedures
 - Research design (Research paradigm (Epistemological and ontological aspects); Approach (deductive, inductive; exploratory, explanatory; qualitative, quantitative, mixed), research type (descriptive, analytical, evaluative, design, etc.), research strategy (experiment, survey, case study, grounded theory, ethnography, action research, etc.), time dimension (cross sectional, longitudinal)
 - Method of data collection (type of data, instrumentation (questionnaire, interview, focus group discussion, document review, observation etc.)
 - Sampling Methods (sampling technique, population, sampling frame, sampling unit, sample size)
 - Operationalization framework (variables and description, measurement type, collection instrument etc.)
 - Plan/method of Data Analysis
 - Data quality assurance (validity, reliability etc.)
13. Limitations
14. Ethical considerations
15. Organization of the thesis
16. Work plan
17. Budget
18. References
19. Appendices (questionnaire, schedule of interview, discussion questions for FGD etc.)

2.1 Title

The title is a window into your research thesis that tells the readers, what it is all about in a few words. It should be clear and precise and not very long. It should clearly state the topic exactly in the smallest number of words. In addition, the following points have to be part of the title page: **name of the researcher; center/department; name of the adviser; and date of delivery under the title.** Note that there could be various formats but a common norm is important for each Center

or department. For example, in the Ethiopian Federal TVETI, the following may serve more dominantly across the institutes and departments:

[TYPE THE TITLE OF YOUR THESIS HERE]

**A THESIS PROPOSAL SUBMITTED TO FEDERAL TVET INSTITUTE
DIVISION OF ELECTRICAL ELECTRONICS AND ICT**

(Department of Information and Communication Technology)

IN PARTIAL FULFILLMENT FOR THE DEGREE MASTER OF SCIENCE IN ICT

(Logo of FTVEIT)

By:

STUDENT NAME: Type your name here

STUDENT NUMBER: Enter your student number

ADVISOR: Type your advisor's name here

CO-ADVISOR: Type your co-advisor's name here

DATE OF SUBMISSION: DD MMMM 20YY

Addis Ababa,

Ethiopia.

NOTE: Title is a label; it is not a sentence. Page number is not given and it is not also counted in any page numbering.

2.2 Summary/ Abstract of a research proposal

It is a **one-page brief summary** of the thesis proposal. The abstract should sufficiently be able to inform the reader why a particular topic/issue/ is important to address (research) and how one tries to address it. The summary/abstract need to contain the thesis statement i.e. your argument (one or two sentences) that tells the reader what the researcher wants to accomplish and why the research is important. Moreover, the researcher needs to show what areas or aspects are to be dealt with and the questions to be answered. In the abstract, research methodology to be applied has to be briefly hinted. As this is a place or part where you can create substantial impressions (positive/negative), on the part of the reader, towards your research proposal, a careful and well-thought out work is critical. It is such issue underpinning/emphasis/ that can aid others recognize and understand your intentions. One important point to know about abstract is that the precise and final version comes at the end.

2.3 Introduction

The introduction is the gate to your research proposal next to the summary/abstract. It is a brief description of what the research proposal is about. It is here where you write what motivated you to research in the area of your topic and what your intention is. It should be self-explanatory that you really know what you are going to do and achieve at the end of the day. The introduction should also indicate the purpose or rationale of your research (why the research is needed at this point in time) and what triggers it. Introduction should not be confused with the background of the study.

2.4 Background

Background is the part of your proposal where you write the context of your choice of specific subject expressed in your title. You briefly mention the real-world context as well as the theoretical background in terms of current debates pertaining to your research area and what and how your research contributes to your debate. If you have not come across any research work on the subject, explain how much this research can fill the existing gap and how can this be achieved. On the other hand, if there is already research output on the subject, you explain how this builds on the frontiers of knowledge and an additional perspective that the current work injects into it. You need to give sufficient background information to allow the reader understand the context and significance of the

issue/question that you are trying to address. By so doing you motivate your readers to read the rest of the proposal.

2.5 Statement of the problem

A research thesis is a response to a problem requiring addressing or seeking solution. This hints about why your research problem is a key to your thesis or dissertation. Your problem statement is the DNA of your research. A statement of the problem presupposes the question (s) that the researcher is planning and determined to answer. Nevertheless, a problem statement is neither the list of all the problems (issues) in the real world in your area of research; nor always about problems. It might be a positive aspect such as an opportunity or strength you want to focus based on your research title. In a research proposal, it is important that the claimed problem/issue stand out tall so that attempts to solving it become compelling. As part of the problem statement, you should provide a justification as to why this research has to be done. Failing to answer it clearly and plainly, the research proposal becomes ambiguous to solve it and puts many researchers in a complete dilemma. On the other hand, a well-articulated statement of the problem establishes the foundation to deal with issues that are stake and to be intervened.

The clarity established at this level of proposal paves ways for subsequent activities in the proposal (e.g. **what research objectives should I set to answer the problem (s/ clearly articulated? What research methods, approaches and research strategy can help me to come to near or completely to the problem? What data sources and what data instruments should I use? What type of data analysis should I employ? etc.)**)

In this vein, the problem/issue under consideration has to be explained first from global, national, sub-national and local perspectives. However, the national, sub-and local problem/issue definitions are more important than the former as this warrants the desirability of the current research. A problem statement is written in one two paragraphs in a maximum of $\frac{1}{2}$ - $\frac{3}{4}$ pages.

2.6 Conceptual Framework

Conceptual framework and theoretical framework are used interchangeably in some literature A conceptual framework serves basically as an initial clarification of the key concepts helpful to define the ideas [theories] on which the research rests and to establish linkage between the main concepts (Wong 2006: 106-108). It serves as a basis for the development of the theoretical and analytical frameworks and facilitates common language for the further unfolding discussions and arguments. In the literature, concepts may be defined in different ways and you will have to make a choice here. In your study, how the concepts defined operationally? How do the different concepts relate among each other? These and other questions should be answered via your conceptual framework.

Theoretical framework, also known as *formalization*, is the further unfolding of the theoretical ideas, reviewing and summarizing of theories to generate variables and their linkages (Wong 2009:108-109). The theoretical framework refers to a summary of the theories that you will refer to in your study. Following the conceptual framework and the literature review and in line with the research problem, questions and research hypothesis; it is now possible to identify the major variables and their linkages.

In both the conceptual framework and theoretical framework, you need to review the relevant literature and identify what major concepts are relevant to the issue/topic of your research, what the theory says about the issue/topic you are addressing. You need to elaborate the different perspectives. What you summarize as part of the conceptual framework or theoretical framework has to be very relevant to the topic and particularly the research problem and the research questions.

While conducting the literature survey, students often throw in whatever literature that is in one way or another related with the research area but not necessarily with the research problem. Failing to

prepare the conceptual framework/theoretical framework properly has at least the following disadvantages:

- a) You will not have the basis to define relevant concepts, identify the variables and define them.
- b) You don't know what relationship to expect.
- c) It will not be easy for you to choose the appropriate research design.
- d) Your data collection instruments will be ill-designed.
- e) During analysis, you will not have any theory to compare your results with.
- f) The contribution of your research to the existing theory will be blurred.

The conceptual framework can be shown as a diagrammatic presentation to the logical flow of the ideas and their relationships presented in the thesis with a highlight of the basic concepts.

Literature Review

A literature review is not a mere compilation of every written work about a topic. Neither is it a list of sources reviewed without having relevance and coherence. Rather, a literature review is the description of the literature that is relevant to a particular field or topic of our interest. It gives an overview of what has been revealed thus far, what the prevailing theories and principles hold, who the key proponents are in the area, what questions are being asked, and what methodologies are appropriate and useful to be applied. On the other hand, it should be underscored that literature review is not itself a primary source about study and should not take precedence over our primary source to be explored or illuminated soon. Literature review, therefore, are written documents, attempting to describe, summarize, evaluate, clarify and/or integrate the content of primary reports. You need to make sure that you seek out reliable sources such as reputable academic journals, books and other scholarly works and look for the most recent information relating to your topic of research.

Organizing a literature review

Though there are varying stylistic approaches to organizing the literature review one uses, the major ones can be in the form of three levels: introduction, the main body and conclusion. These three parts may not be implicitly observable. However, it is clearly discernable when a person tends to introduce an idea, gives depth and breadth to the reader, and finally comes to a stage to wind it up. The usual phrases such as "in conclusion", "to sum up", "finally", etc. all show that the narration is coming to near end. In general, literature reviews are organized taking into account: around related research questions, synthesizing results into a summary of what is and what is not known, distinguishing areas of controversy in the literature so that readers can weigh the truth and the level of authenticity, acceptance or opposition, and identifying issues or questions (gaps) that may need further research.

2.7 Research objectives

Research objectives are intended outcomes of the research undertaking. The objectives of a research delineate the ends or aim which the inquirer seeks to bring about as a result of completing the research undertaken. An objective may be thought of as either a solution to a problem or a step along the way toward achieving a solution; an end state to be achieved in relation to the problem/issue. Objectives should be closely related to the statement of the problem. Objectives should be

- Simple (not complex),
- Specific (not vague),
- Stated in advance (not after the research is done), and
- Specific enough to be measured.

The objectives of a research project summarize what to be achieved by the study. The formulation of objectives will help you to:

- Focus the study (narrowing it down to essentials);
- Avoid the collection of data which are not strictly necessary for understanding and solving the problem you have identified; and
- Organize the study in clearly defined parts or phases.

Properly formulated objectives will facilitate the development of your research methodology and will help to orient the collection, analysis, interpretation and utilization of data. Take care that the objectives of your study:

- Cover the different aspects of the problem and its contributing factors in a coherent way and in a logical sequence;
- Are clearly phrased in operational terms, specifying exactly what you are going to do, where, and for what purpose;
- Are feasible;
- Are realistic considering local conditions;
- Are phrased to clearly meet the purpose of the study; and
- Use action verbs that are specific enough to be evaluated.

Commonly, research objectives are classified into main objectives and specific objectives.

2.7.1 Main Objective

The main objective is a clear and concise statement of what the study seeks to accomplish. It is a general statement specifying the desired outcomes of the research project. The main objective is a broad statement which shows whether the research intends to evaluate, explore, explain, and assess a chosen phenomenon. It is important to ascertain that the main objective is closely related to the statement of the problem. The objective is set in such a way that it facilitates the formulation of specific objectives. The main and specific objectives are logically connected to each other.

2.7.2 Specific Objectives

The specific objectives are commonly considered as smaller partitions of the general objective. They are a breakdown of what to be accomplished into smaller logical components. They specify the outcomes and their assessment in measurable terms. When put together, the specific objectives, which must be set in SMART (Specific, Measurable, Achievable, Realistic and Time bound) formation, must lead to the accomplishment of the main objective of the study. Specific objectives should systematically address the various aspects of the problem as defined under Statement of the Problem and the key factors that are assumed to influence or cause the problem. Each objective might comprise a section of a research report, each with a method that will indicate how the specific objective or sub problem will be addressed.

2.8 Research Questions/Hypotheses

The decision to formulate either research questions or hypotheses will depend on the research approach you have chosen. The general rule is to formulate research questions for qualitative studies along the inductive approach (theory building) and research hypothesis for quantitative studies along the deductive research approach (theory testing).

2.8.1 Research Questions

Research questions create a relationship between two or more variables while phrasing the relationship in the form of a question. These are problem statements derived from the overall conceptions of the study under consideration. They are critically important for data gathering and analysis. In other words, we see that research questions are derived from the problem statement as this latter part clearly sets the extent of the issue and why this activity is relevant to be undertaken. Research questions also provide clues as to how research objectives are to be framed to achieve intended goals. They have to be clear and precise. This compels the researcher to make sure that there are observable and direct links between the two i.e. the specific objectives and corresponding research questions. The research questions should render themselves to clear and precise answers. Avoid double barrel questions and research questions which cannot be answered either by lack of empirical data or requiring a different type of unfamiliar methodology.

2.8.2 Hypothesis

In deductive research designs, it is necessary that you formulate some hypothesis. Once you are clear with the theory and your conceptual framework, you can state some hypothesis. A hypothesis

is a tentative conjectural statement of a relationship between or among variables (independent and dependent) - a sort of intellectual (informed) guess. It is a tentative assumption made in order to draw out and set its logical or empirical consequences. It should be specific and pertinent to the piece of research in hand. It must be statistically testable and related to observable phenomenon. The relationship being tested must be specific and unambiguous. The statement should be tested through research and must, finally, be either accepted or rejected.

The hypothesis will provide the focal point for your research; to delimit the area, sharpen thinking and keep the researcher on the right track. Also remember that your hypothesis determines data type required; the data collection and sampling methods to be used; the tests that must be conducted during data analysis.

Note that hypotheses are usually important and relevant in advanced theoretical researches and most often when quantitative inquiries are made. While research questions pose relationships between two or more variables and establishes the relationship in question forms, hypotheses represent the declarative statement of the relations between the two.

2.9 Significance

Here you should demonstrate why it is worthwhile to go through the pains of research (Sometime this component can be devoted to a separate section known as 'Justification of Study'). State the benefits to be derived from the research and indicate who is likely to benefit and how this is likely to happen. Significance further includes how the research result might of benefit to theory, knowledge, practice, policy and future research.

2.10 Scope (thematic, spatial, temporal)

This refers to the contextual and conceptual boundaries of the study which may include population /sample size, the key concerns of study and the extent it tries to resolve the problem. Referring to the data use and collection it also covers the spatial extent (geography area), temporal (the period the data covers) and thematic area.

2.11 Description of the study area

There is need to indicate where the study was done and to describe its key characteristics (climate, geology, soils, land use, vegetation, socioeconomic activities, population etc). Indicate the geographical locality distance from the national capital and some major regional towns nearby, as well as the geographical co-ordinates. A locality map for the study area is desirable but not mandatory. However, please note that **a brief half page description is quite adequate unless and otherwise your research is also related to investigation of how a specific context affects your research outcome**. You would rather spend more effort in the scope of the study.

2.12 Research Methods and procedures

The methods or procedures section is really the heart of the research proposal. You must decide exactly how you are going to achieve your stated objectives: i.e., what new data you need in order to shed light on the problem you have selected and how you are going to collect and process this data. The activities should be described with as much detail as possible, and the continuity between them should be apparent. You should indicate the methodological steps you will take to answer every question, to test every hypothesis illustrated in the Questions/Hypotheses section or address the objectives you set.

It is appropriate at this juncture to explain the difference between research methodology and research methods. Research method is about all those methods/techniques that are used for conducting research including tools and techniques used to obtain and analyze data. Methodology refers to the theory of how research should be undertaken. It is a science of how research is done scientifically. You should know not only the research methods and techniques, but also the assumptions underlying the various techniques and why a specific decision on certain techniques

and procedures are applicable to certain problems and not to others. Research methodology has many dimensions and research methods constitute a part of the research methodology.

2.12.1. Research Design

The function of research design is to provide a summary of the procedures that will be followed in the collection and analysis of data, as well as the timeframes in which the processes will be accomplished. A research design is like the blue print for house construction. If you start building a house without first having the designs of the various aspects of the building, the result is you don't know what type of house you will end up with; it will be costly and time taking; often involving construction and demolition of what has been constructed. Most importantly, the house lacks quality and may be prone to risks. Likewise, a research conducted without a research design at hand is aimless, ambiguous, time taking, costly and may be totally irrelevant and unacceptable in light of the requirements for a scientific investigation. Research design refers to the crafting of the conceptual structure within which research will be conducted in a way that is as efficient as possible, the collection of relevant evidence with minimal expenditure of effort, time and money.

Just to give a short explanation of why stating the *research paradigm* adopted by the research is important we need to define the terms *methodology* and *epistemology*. Epistemology can be defined as the philosophy of how we come to know. It is the study of nature of knowledge and justification from where knowledge has come and how we know what we know. The research pyramid consists of *research paradigm* on top, followed by *research methodology*, *research methods* and *research techniques* at the bottom rung. *Paradigm* is your world view, how you view the world. It can be defined as mental tools, frames of reference that help people within a particular group communicate and understand each other (Cooper and Schindler (2008:5). *Methodology* is the philosophy or the general principle which will guide your research. It is a way to conduct research that is tailored to research paradigm. *Method* is about the specific steps of action that need to be executed in a specific stringent order; while *research techniques* refer to practical instruments or tools for generating, collecting and analysis of data. among the philosophical schools, *positivism* sticks to what observed and measured while *interpretivism* seeks to understand the subjective reality of those they study. *post positivism* is taken as the 'scientific method' and belongs to quantitative research domain. The basic assumptions of the *post positivist* position are: knowledge is *conjectural* and absolute truth can never be found, research is the process of making claims and then refining and abandoning some of them for other claims more strongly warranted; data, evidence, and rational considerations shape knowledge; and being objective. In contrast the *interpretivism* They aim on values and outcomes assessed by various stakeholders and engage in the qualitative data collection procedures to promote dialogue, such as participant observations, interviews, and focus groups, giving a voice to insider perspectives (Howe 2004:53-54).

The research design of a research includes (Research paradigm (Epistemological and ontological aspects); research approach (deductive, inductive; exploratory, explanatory; qualitative, quantitative, mixed), research type (descriptive, analytical, evaluative, design, etc.), research strategy (experiment, survey, case study, grounded theory, ethnography, action research, etc.), time dimension (cross sectional, longitudinal or approximation of longitudinal data using cross-sectional design). Therefore, in this section you need to state each component of your research design with their justification why you choose them.

The "methods" section of a research proposal among others includes:

- Information to allow the reader to assess the believability of your approach.
- Information needed by another researcher to replicate your experiment.
- Description of your materials, procedure, theory.
- Calculations, technique, procedure, equipment, and calibration plots.
- Limitations, assumptions, and range of validity.

• Description of your analytical methods, including reference to any specialized statistical software. The proposal should describe in detail the general research plan. (may not necessarily be true for all types of research) which include but not limited to the following:

- Description of study area
- Description of study design
- Description of study participants
- Eligibility criteria (if any)
- Determination of sample size (if any)
- Description of selection process (sampling method)
- Methods of data collection
- Description of the expected outcome and explanatory variables... (if any)
- How data quality is ensured
- Operational definition
- Presentation of the data analysis methods

It is essential to state the research approach/paradigm to be adopted by the research e.g. qualitative or quantitative, giving the justification for choosing it.

The research design must include the following;

- a. The selection of variables relevant to the stated specific objectives.
- b. The data collection method(s) and technique(s).
- c. Sampling procedure(s) and the statistical testing tools.
- d. The plan for data collection, processing and analysis.
- e. Ethical considerations and how to overcome them.
- f. The pre-test or pilot study before the full research.

Methods of Data Collection

Each research method has its own techniques which should be clearly stated. However it is important that the chosen research design is competent to respond to the research purpose, objectives and questions. For example, if the purpose of any research is to assess the satisfaction level of local residents towards any public service it may require research methods such as questionnaires, interviews and focus group discussions. Each research method needs to be clearly stated with its justification why you are using it in line with the research objectives.

Issues to remember:

1. Be aware of possible sources of error to which your design exposes you. You will not produce a perfect, error free design (no one can). However, you should anticipate possible sources of error and attempt to overcome them or take them into account in your analysis.
2. You need to read books on Research Methods and Techniques to understand the specific nature of each research approach, type, research strategy, and instrumentation.

2.12.2 Sampling

Sampling for quantitative studies

Sampling is the process of selecting a number of study units from a defined study population. Often research focuses on a large population that, for practical reasons, it is only possible to include some of its members in the investigation. You then have to draw a sample from the total population. In such cases you must consider the following questions:

- What is the study population you are interested in from which we want to draw a sample?
- How many subjects do you need in your sample?
- How will these subjects be selected?

The study population has to be clearly defined. Otherwise you cannot do the sampling. Apart from persons, a study population may consist of villages, institutions, plants, animals, records, etc. Each study population consists of study units. The way you define your study population and your study unit depends on the problem you want to investigate and on the objectives of the study.

The key reason for being concerned with sampling is that of validity—the extent to which the interpretations of the results of the study follow from the study itself and the extent to which results may be generalized to other situations with other people or situation. Sampling is critical to external validity—the extent to which findings of a study can be generalized to people or situations other than those observed in the study. To generalize validly the findings from a sample to some defined population requires that the sample has been drawn from that population according to one of several probability sampling plans. By a probability sample it is meant that the probability of inclusion in the sample of any element in the population must be given a priori. All probability samples involve the idea of random sampling at some stage. Probability sampling requires that a listing of all study units exists or can be compiled. This listing is called the sampling frame. Of course, at times, it is impossible to obtain a complete list of the population.

Another reason for being concerned with sampling is that of internal validity—the extent to which the outcomes of a study result from the variables that were manipulated, measured, or selected rather than from other variables not systematically treated. Without probability sampling, error estimates cannot be constructed. Perhaps the key word in sampling is representative. If researchers want to draw conclusions which are valid for the whole study population, which requires a quantitative study design, they should take care to draw a sample in such a way that it is representative of that population. A representative sample has all the important characteristics of the population from which it is drawn.

Examples of probability sampling

Simple random sampling:

The guiding principle behind this technique is that each element must have an equal and nonzero chance of being selected. This can be achieved by applying a table of random numbers or a computer-generated random number to a numbered sampling frame. Another approach involves drawing numbers from a container. The product of this technique is a sample determined entirely by chance. It should be noted, however, that chance is “lumpy”, meaning that random selection does not always produce a sample that is representative of the population. Imagine, for example, a sampling frame comprising 10,000 people. Furthermore, consider that altitude is a critical variable, and that the composition of the sampling frame is as follows: 1,500 are from high altitude; 7,500 are from medium altitude white, and 1,000 are from low altitude. You are going to select a sample of 500 people from this sampling frame using a simple random sampling technique. Unfortunately, the simple random selection process may or may not yield a sample that has equivalent altitudinal proportions as the sampling frame. Due to chance, disproportionate numbers of each altitudinal category may be selected.

Systematic sampling

The systematic random sampling technique begins with selecting one element at random in the sampling frame as the starting point; however, from this point onward, the rest of the sample is selected systematically by applying a predetermined interval. For example, in this sampling technique, after the initial element is selected at random, every “kth” element will be selected (kth refers to the size of the interval—the ratio of the population to sample size) and becomes eligible for inclusion in the study. The “kth” element is selected through the end of the sampling frame and then from the beginning until random selection was made). If there is a cyclic repetition in the sampling frame, systematic sampling is not recommended.

Stratified sampling

Stratified random sampling begins with the identification of some variable, which may be related indirectly to the research question and could act as a confounder (such as geography, age, income, ethnicity, or gender) This variable is then used to divide the sampling frame into mutually exclusive strata or subgroups. Once the sampling frame is arranged by strata, the sample is selected from each stratum using simple random sampling or systematic sampling techniques. It is important that the sample selected within each stratum reflects proportionately the population proportions: thus, you can employ proportionate stratified sampling.

Cluster sampling

It may be difficult or impossible to take a simple random sample of the units of the study population at random, because a complete sampling frame does not exist. Logistical difficulties may also discourage random sampling techniques (e.g., interviewing people who are scattered over a large area may be too time-consuming). However, when a list of groupings of study units is available (e.g. villages or schools) or can be easily compiled, a number of these groupings can be randomly selected. Then all study units in the selected clusters will be included in the study.

Multistage sampling

Multistage cluster sampling is used when an appropriate sampling frame does not exist or cannot be obtained. Multistage cluster sampling uses a collection of preexisting units or clusters to “stand in” for a sampling frame. The first stage in the process is selecting a sample of clusters at random from the list of all known clusters. The second stage consists of selecting a random sample from each cluster. Because of this multistage process, the likelihood of sampling bias increases. This creates a lack of sampling precision known as a design effect. It is recommended to consider the design effect during sample size determination.

Purposeful sampling strategies for qualitative studies

Qualitative research methods are typically used when focusing on a limited number of informants, whom you select strategically so that their in-depth information will give optimal insight into an issue about which little is known. There are several possible strategies from which a researcher can choose. Often different strategies are combined, depending on the topic under study, the type of information wanted and the resources of the investigator(s).

2.12.3 Sample Size

a. Sample size in quantitative studies

Having decided how to select the sample, you have to determine the sample size. The research proposal should provide information and justification about sample size. It is not necessarily true that the bigger the sample, the better the study. Beyond a certain point, an increase in sample size will not improve the study. In fact, it may do the opposite; if the quality of the measurement or data collection is adversely affected by the large size of the study. After a certain sample size, in general, it is much better to increase the accuracy and richness of data collection (for example by improving the training of interviewers, by pre-testing of the data collection tools or by calibrating measurement devices). Than to increase sample size. Also, it is better to make extra effort to get a representative sample rather than to get a very large sample.

The level of precision needed for the estimates will impact the sample size. Generally, the actual sample size of a study is a compromise between the level of precision to be achieved, the research budget and any other operational constraints, such as time (see 3.2.7). In order to achieve a certain level of precision, the sample size will depend, among other things, on the following factors:

- The variability of the characteristics being observed: If every person in a population had the same salary, then a sample of one person would be all you would need to estimate the

average salary of the population. If the salaries are very different, then you would need a bigger sample in order to produce a reliable estimate.

- The population size: To a certain extent, the bigger the population, the bigger the sample needed. But once you reach a certain level, an increase in population no longer affects the sample size. For instance, the necessary sample size to achieve a certain level of precision will be about the same for a population of one million as for a population twice that size.
- The sampling and estimation methods: Not all sampling and estimation methods have the same level of efficiency. You will need a bigger sample if your method is not the most efficient. But because of operational constraints and the unavailability of an adequate frame, you cannot always use the most efficient technique.

When the study is designed to find a difference or an association, you may not find a difference or an association. In this case, we still want to calculate statistical probability that we may have missed a difference or an association that exists in the population, but was not found in the sample. This so-called statistical power of the study depends also on the size of the sample. The larger the sample size, the higher the power of the study. For calculating sample size before the study begins, the researchers have to decide on the level of statistical power they are willing to accept for the study. Traditionally, most studies set a power of 80%. The effect size in a study refers to the actual size of the difference observed between groups or the strength of relationships between variables. The likelihood that a study will be able to detect an association between the variables depends on the magnitude of the association you decide to look for. Large sample sizes are needed to detect small differences. The choice of effect size is difficult and arbitrary, but it must be set beforehand and must make a meaningful difference. In designing a study, the researcher chooses the size of effect that is considered important.

b. Sample size in qualitative studies

There are no fixed rules for sample size in qualitative research. The size of the sample depends on what you try to find out, and from what different informants or perspectives you try to find that out. You can start with two or four Focus Group Discussions (FGDs) depending on the complexity of the research objectives. If the different data sets reconfirm each other you may stop at this point; otherwise you conduct one or two FGDs more till you reach the point of redundancy, i.e. no new data comes up any more. In exploratory studies, the sample size is therefore estimated beforehand as precisely as possible, but not determined. Richness of the data and analytical capability of the researcher determine the validity and meaningfulness of qualitative data more than sample size. Still, sampling procedures and sample size should always be carefully explained in order to avoid the illusion of haphazardness.

2.12.4 Analysis Plan

Specify the analysis procedures you will use, and label them accurately. The analysis plan should be described in detail. If coding procedures are to be used, describe reasonable detail. If you are triangulating, carefully explain

how you are going to do it. Each research question will usually require its own analysis. This, the research questions should be addressed one at a time followed by a description of the type of statistical tests (if necessary) that will be performed to answer that research question. Be specific. State what variables will be included in the analyses and identify the dependent and independent variables if such a relationship exists. Decision making criteria (e.g., the critical alpha level) should also be stated, as well as the computer software that will be used (if there is a need to use one). These help you and the reader evaluate the choices you made and procedures you followed.

Issue to remember: Provide a well-thought-out rationale for your decision to use the design, methodology, and analyses you have selected.

2.13 Work plan

Work plan 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 within a specific time-span.

It may include:

- The tasks to be performed;
- When and where the tasks will be performed;
- Who will perform the tasks and the time each person will spend on them;
- It describes the plan of assessing the ongoing progress toward achieving the research objectives; completion,
- The plan specifies how each project activity is to be measured in terms of the line for its completion;
- A good work time plan enables both the investigators and the advisor to monitor project progress and provide timely feedback for research modification or adjustments.

Issues to remember: In the work plan:

- Different components/phases/stages of the study be stated
- Description of activities in each phase
- Time required to accomplish the various aspects of the study activities should also be indicated

GANTT Chart for your plan. A GANTT chart is a planning tool that depicts graphically the order in which various tasks must be completed and the duration of each activity.

The GANTT chart indicates:

- The tasks to be performed;
- Who is responsible for each task; and
- The time each task is expected to take.

The length of each task is shown by a bar that extends over the number of days, weeks or months the task is expected to take.

2.14 Budget and funding

Though may not apply to this specific research, it is important to remember that funding agencies will invariably read through the whole proposal (not just the budget requirement). Therefore, it is critical that the entire proposal document is well thought out and written to effectively communicate the aim of the research and how you planned to achieve it.

Budget items need to be explicitly stated as follows:

Personnel: supervisors, data collector, etc.

- Consumable supplies: stationeries, computers and educational materials
- Travel: cost of projected-related
- Communications: postage, travel, telephone, telegram, fax, e-mail charges associated with a project
- Publication: the cost incurred of preparing and publishing the results of the research. It includes; technical reports, manuscripts, illustrations, graphics, photography, slides, and overheads
- Other direct costs: costs of all items that do not fit into any of the above direct costs (**please get enough information from the Finance before lining up these costs**).

Budget justification

It is not sufficient to present a budget without explanation. The budget justification follows the budget as an explanatory note justifying briefly, in the context of the proposal, why the various items in the budget are required. Make sure you give clear explanations concerning why items that may seem questionable or that are particularly costly are needed and discuss how complicated expenses have been calculated. If a strong budget justification is presented, it is less likely that essential items will be cut during proposal review.

2.15 References

You must give references to all the information that you obtain from books, papers in journals, and other sources. References may be made in the main text using index numbers in brackets (Vancouver style) or authors name (Harvard style). But note must be made that **mix is not allowed** and one should keep consistency in using either of the two standards. You will also need to place a list of references, numbered as in the main text (or alphabetically ordered), at the end of your research proposal. The exact format for depicting references within the body of the text and as well as the end of the proposal varies from one discipline to another. However, let us agree to have Harvard style referencing at university level.

The information you give in the reference list must be enough for readers to find the books and papers in a library or a database. It also demonstrates to those interested in your proposal how well versed you are on the particular area of research.

As a general guideline, there are certain items that must be included from each source reference. As mentioned above, the exact format applicable to your particular area of study will be left for you to find out.

For a journal paper give:

- The names of the authors,
- The year of publication,
- The title of the paper,
- The title of the journal,
- The volume number of the journal,
- The first and last page numbers of the paper.

For a book give:

- The author,
- The year of publication,
- The title, and the edition number if there is one,
- The name of the publisher,
- The page numbers for your reference.

For an internet reference give:

- The author of the web page,
- The title of the item on the web page,
- The date the item was posted on the web page
- The date the item was accessed from the web page
- The complete and exact URL.

Make sure that every reference in your main text must appear in the list at the end of your proposal, and every reference in the list must be mentioned in your main text.

2.16 Appendices/Annexes

Include in the appendices of your proposal any additional information you think might be helpful to a proposal reviewer. For example, include:

- Questionnaires & other data collocation forms
- Dummy tables

- Biographical data on the principal investigator
- The consent form (if any)

Summary

Scientific research commences with the writing of a research proposal which is a detailed plan that the researcher intends to follow and which will give an adjudicator or evaluator a clear idea of what the researcher plans to do and how he or she intends to complete the research. The research proposal contains a description of the research topic and the literature survey, motivation for the research, a statement of the problem, a hypothesis, the research methodology to be used, clarification of terms, and the sources consulted to demarcate the research problem.

Quality writing is critical in all good proposals. It should be clear, concise, and free of jargon. There should be no spelling or grammatical errors, and the proposal should be easy to read. Sloppy proposals and proposals laden with jargon do not provide a positive image to the reader, nor do they lend confidence that solid research will follow. Proposals that are well-written and attractive are a pleasure to read, and they make a good impression with readers/reviewers.

Sources:

1. Addis Ababa University, Graduate Programs, Graduate Studies and Research Office (2009)
2. Ethiopian Civil Service College, Urban Management Masters Program Thesis writing Guideline (2010)

[TYPE THE TITLE OF YOUR THESIS HERE]

**A THESIS PROPOSAL SUBMITTED TO FEDERAL TVET INSTITUTE
DIVISION OF ELECTRICAL ELECTRONICS AND ICT**

(Department of Information and Communication Technology)

**IN PARTIAL FULFILLMENT FOR THE DEGREE MASTER OF
SCIENCE IN ICT**



By:

STUDENT NAME: Type your name here

STUDENT NUMBER: Enter your student number

ADVISOR: Type your advisor's name here

CO-ADVISOR: Type your co-advisor's name here

DATE OF SUBMISSION: DD MMMM 20YY

Addis Ababa,

Ethiopia.

Declaration

I hereby declare that this MSc Thesis proposal is my original work and has not been presented for a degree in any other university, and all sources of material used for this thesis have been duly acknowledged.

Name: _____

Signature: _____

This MSc Thesis has been submitted for examination with my approval as thesis advisor.

Name: _____

Signature: _____

Date of submission: _____

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ABSTRACT

Background

Methods

Results

Discussion and Conclusion

Do not use abbreviations or insert tables, figures or references into your abstract. Your abstract generally should not exceed about 300 words.

INTRODUCTION

USE HEADING 1 FROM THE SELECTION ABOVE FOR YOUR MAIN HEADING. USE ALL CAPS, DO NOT USE ANYTHING ELSE AS THE TABLE OF CONTENTS HAS BEEN AUTOMATED TO USE THIS SETTING

Sub Heading

Use Heading 2 from the selection of styles on the menu bar above. Do NOT use all capitals, but write as is shown above. Do not use anything else as the Table of Contents has been automated to include this style for a subheading.

Sub-Sub-Heading

Use Heading 3 from the selection of styles on the menu bar above. Do NOT use all capitals, but write as is shown above. Do not use anything else as the Table of Contents has been automated to include this style for a sub-subheading.

Referencing

When do your referencing, use the automatic system provided by Microsoft Word. To use this, from the Menu bar, go to Insert > Reference > Footnote. Now select Endnote > end of document. For the options, select Number format > 1, 2, 3; Custom mark > leave blank; Start at > 1; Numbering > continuous. If you do this, you will see a superscript inserted at the point of your cursor, as in this example, with the cursor automatically going to the end of your document for you to insert your reference details¹. This keeps a continuous numbering system as you progress through your proposal. Once you are done, you could move this from the last page to the last page before the Appendices.

PROBLEM STATEMENT

Overview

Research Question/Hypothesis

OBJECTIVES AND AIMS

Overall Objective

Specific Aims

BACKGROUND AND SIGNIFICANCE

This is your literature review. Use Headings 2 and 3 to provide sub headings in your review

RESEARCH DESIGN AND METHODS

Overview

Use headings 2 and 3 as appropriate, and use these headings if appropriate.

Population and Study Sample

Sample Size and Selection of Sample

Sources of Data

Collection of Data

Exposure Assessment

Data Management

Data Analysis Strategies

Ethics and Human Subjects Issues

Timeframes

STRENGTHS AND WEAKNESSES OF THE STUDY

LITERATURE REVIEW

BUDGET AND TIMEFRAME

REFERENCES

References should be numbered consecutively in the order in which they are first mentioned in the text. Identify references in text, tables, and legends by Arabic numerals in parentheses. The titles of journals should be abbreviated according to the style used in Index Medicus.

APPENDICES

Appendix 1: Questionnaire
