

18th RUFORUM ANNUAL GENERAL MEETING 2022

**RESEARCH METHODS (PROPOSAL DEVELOPMENT AND SCIENTIFIC WRITING TRAINING)
FOR
POSTGRADUATE STUDENTS**

Date: 10th -11th December 2022

Time: 8:00am – 5:00pm

Venue: Lecture Room F4. University of Zimbabwe

By

Resource Persons

Prof. Susan Balaba Tumwebaze (susantumwebaze@gmail.com)

Dr. Thomas Lapaka Odong (Thomas.l.odong@gmail.com)

Dr. Hellen Namaweje (hnamaweje@gmail.com)

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CO-ORGANISERS:



1.0 Introduction

Research in Africa involves generating climate change, forestry output and other technologies that can improve food security. The impact is yet to be felt in sub-Saharan African (SSA) households. Scientific data management enhances the capacity of postgraduate students to meaningfully engage in conducting quality research by developing appropriate research proposals, design of studies, collection and analysis of data for meaningful reporting. The resource team at Makerere University and the selected post-doctoral, doctoral and MSc students will undergo training on research methods that will enable them have proposal development and scientific writing skills. This training will prepare students to examine the essential parts of their proposal and how to write them. Students will practice writing selected parts of their proposal for their research. Research Proposal training provides students with the skills and tools they need to write a strong research proposal which is the first step towards successful research process. The training will cover one week of hands-on experience, which will be delivered using a blended mode approach for 1-week between 11-16th /12/2022 and researchers and students are expected to have a well written proposal ready for defence at the end of the training (see detailed programme attached).

1.1 Overall objective

To Equip students with appropriate knowledge, skills and techniques in developing appropriate scientific research proposal contributing to technology development, innovation and business for rural agricultural transformation in selected vulnerable areas as well as other fields of specialization. For example, entrepreneurship, humanities, finance among others.

1.2 Specific objectives

The training will enable students/participants to:

- i) Correctly define the research problem and contextualise it within their study scope.
- ii) Improve on refining their study titles of prospective research proposal.
- iii) Explore different research paradigms
- iv) Revise/modify their research problems, research objectives, questions and hypotheses of prospective proposals
- v) Examine and improve on their study designs and types of data to collect from fields and laboratories of their research proposal
- vi) Apply different data analysis packages on their data
- vii) Apply different standard reference managers in their work used in publications.

1.3 Learning Outcomes (Expectations)

At the end of the training participants would be able to:

- 1) Apply the appropriate research paradigms to their research
- 2) Apply the appropriate research designs to address a problem
- 3) Employ different data collection methods in their research
- 4) Use relevant statistical methods and packages in data analysis
- 5) Use standard reference managers as required by different publishing houses.

1.4 Target audience

Research methods training is targeting researchers and post graduate students (masters, pre-doctoral, doctoral, and post-doctoral) specializing in the following fields and other related ones: Animal Sciences, Humanities, Economics, Entrepreneurship, Food Science, Agricultural Economics, Nature resources management, Plant breeding, Crop, Animal and Horticultural Sciences among others.

1.5 Delivery Method and Requirements

The training will consider a blended learning approach (online and face to face), participants will be introduced to brief theory that will later be translated to their different proposal development sections. Practical examples of learning will be used and related to proposal research development and how different parts of the proposal are developed in a systematic manner. Each participant is expected to have a research title and the instructors will be using participants titles/proposed titles when explaining how to develop a good proposal. Some participants will be given chance to present their work on a daily basis to check if the concepts have been learnt as expected as per the learning outcomes.

1.6 Duration

The course will take 2 working days each day starting at 08:00am up to 5:00 pm, with breaks in between.

2.0 Detailed training content

The following modules will be covered under research methods, that is, Research philosophies and Approaches, Problem Identification and Analysis, Study design, Data Collection Methods and Tools, Data management and Analysis (Quantitative and Qualitative), and Writing and Dissemination of Research results.

The modules are meant to help the participants understand the different sections required during proposal development. For example, how to come up with a title, develop the background of the study, how to identify a problem, write the problem statement, using a problem tree analysis, write SMART objectives, methods of data collection, methods of analyzing data, results interpretation and dissertation/ thesis presentation among others. The core aim is to see that all the participants who have trained in this course, have a fully developed proposal.

2.1 Module 1- Research philosophies and Approaches

Definition of Research, Elements of Research, Philosophical elements: What do we believe?, Paradigms of research, Characteristics of Research paradigms, Categories of paradigms (positivism, interpretivism and constructivism etc.), Praxis: What do we do?, Pillars of Research philosophy, Research approaches, Qualitative approach, Significance of research, Complexity thinking, Reductivism, Complexity, Explicit/tacit knowledge framework, Unlearning selective exposure, Conscience competence matrix (unconscious incompetence, conscious incompetence, conscious competence, unconscious competence), Learning loops model (single-loop learning, double-loop learning, triple-loop learning), Frames and habits of mind for complex thinkers, Habits of mind that promote openness, Habits of mind that promote situational awareness, Habits of mind that promote healthy respect for the restraint/action paradox

2.2 Module 2- Problem Identification and Analysis

What is a scientific study, Research proposal, Research cycle, Research process, Designing and planning a scientific study, Research methods, difference between quantitative and qualitative approaches, Key aspects of literature review, Problem identification and formulation (problem tree), Setting clear Objectives, research questions and hypotheses, guiding principles of making a good hypothesis Designing and Planning a Scientific Study, Advantages of tree problem, objective analysis, steps to defining the research problem, Problem statement, format of postgraduate research proposal, research ethics, references, research funding.

2.3 Module 3- Study design, Data Collection Methods and Tools

What is quantitative research?, quantitative research tenets/views, characteristics of quantitative research, types of quantitative research designs, independent, dependent and lurking variables, principles of experimental design, standard experimental designs, Qualitative versus quantitative research approaches, Qualitative, KI, FGD, In-depth interviews, case study, etc., Quantitative-Sampling surveys (Sampling techniques and applications, Experiments, Quasi-Experiments, Data collection tools, Sketch maps and transect walks, Key Tools; GPS,

Questionnaires, Interview guides, checklist, Data collection software (Smartphones, tablets, recorder, camera), types of surveys, research designs, online survey tools.

2.4 Module 4- Data management and Analysis (Quantitative and Qualitative)

Principles of Data management, Data Coding and entry, Data cleaning and archiving, Overview of data analysis and statistical software, Data exploration, Data analysis and interpretation, testing how good the data is, hypothesis testing, methods of hypothesis testing, Reliability of measures (Cronbach's alpha), descriptive statistics, inferential statistics.

2.5 Module 5- Writing and Dissemination of Research results

Scientific presentation and publications, online search engines, scientific online search engines, library searches, how to access library search? selecting a topic, search strategies, types of information, publication cycles, publication of scientific journals, reference managers (with word, EndNote 20, Mendeley, Zotero).

3.0 An overview of the course outcomes

Each of the modules stated above will result into the following outcomes:

3.1 Outcomes for Module 1 on Research philosophies and Approaches

Participants will be able to:

- ❖ Definition of Research
- ❖ State the Elements of Research
- ❖ Explain the Philosophical elements: What do we believe?
- ❖ State the Paradigms of research
- ❖ Describe the characteristics of Research paradigms
- ❖ Identify the different categories of paradigms (positivism, interpretivism and constructivism etc.)
- ❖ Explain the Significances of research
- ❖ Define complexity thinking
- ❖ Explain the Conscience competence matrix (unconscious incompetence, conscious incompetence, conscious competence)

3.2 Outcomes of Module 2 on Problem Identification and Analysis

By the end of this module, participants will be able to:

- ❖ Plan to undertake a Scientific study: Sketch a Research Proposal.

- ❖ Use a problem tree to identify and formulate a research problem
- ❖ Set SMART objectives for your research
- ❖ Determine key aspects of a literature review

3.3 Outcomes of Module 3 on- Study design, Data Collection Methods and Tools

Participants should be able to:

- ❖ Prepare data for analysis
- ❖ Identify and know how/ when to apply the various statistical tests in analyzing data to attain the set objectives.
- ❖ Set a hypothesis test of a given study/ experiment.

3.4 Outcomes of Module 4 on Data management and Analysis (Quantitative and Qualitative)

Participants should be able to

- ❖ Define Quantitative Research
- ❖ State the aims of Quantitative Research
- ❖ State the characteristics of Quantitative Research
- ❖ Identify the Quantitative Research Design and its types
- ❖ Use different methodologies of Quantitative Research Design
- ❖ Identify the goals/purpose of Qualitative Research
- ❖ Compare Qualitative vs. Quantitative Research
- ❖ Explain the types of Qualitative Research
- ❖ Describe the different Sampling approaches in both qualitative and quantitative research.

3.5 Outcomes of Modules 5 on Writing and Dissemination of Research results

Participants should be able:

- ❖ To write a scientific manuscript
- ❖ Identify appropriate journals for publications
- ❖ Disseminate research results to different audiences.