



# **UNIVERSITY OF EMBU**

**PROCEEDINGS  
OF  
THE SECOND PROPOSAL AND THESIS WRITING  
WORKSHOP  
For  
M.A, MSc, MBA, M.Ed. and Ph.D. Students**

**Date: 26<sup>th</sup> April 2018**

**Venue: Charter Hall, University of Embu**

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**Date: 26<sup>th</sup> April 2018**

**Venue: Charter Hall, University of Embu**

**Organized by:** Board of Postgraduate Studies  
University of Embu

**Rapporteurs:**

Ms Susan Wairimu Muriuki  
Mr Edwin Ngetha Kihagi  
Ms. Irene Wambui Mwangi

**Compiled and Edited by:** Prof. Nancy Budambula

# WORKSHOP PROGRAMME



## UNIVERSITY OF EMBU

### *Programme*

### Second Proposal and Thesis Writing Workshop



P.O. BOX 6 - 60100  
EMBU, KENYA  
TEL: (+254-20) 2444136  
EMAIL: [vc@embuni.ac.ke](mailto:vc@embuni.ac.ke), [info@embuni.ac.ke](mailto:info@embuni.ac.ke)  
WEBSITE: [www.embuni.ac.ke](http://www.embuni.ac.ke)

**DATE:** Thursday, 26<sup>th</sup> April, 2018

**TIME:** 8.30 a.m. - 5.00 p.m., **VENUE:** University of Embu Charter Hall

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# Programme

Dr. Samuel N. Kariuki, CoD Business and Economics.



## OUR VISION

A dynamic epicenter of excellence in training and research for service to humanity.

## OUR MISSION

To generate, advance and disseminate knowledge through training, research and innovation for the development of humanity.

## PHILOSOPHY

Enhancing human capacity for societal development

## OUR CORE VALUES

Integrity  
Innovativeness  
Professionalism  
Customer focus  
Teamwork

| TIME                                      | ACTIVITY                                                                       | ACTION BY                                                                           |
|-------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 8.30 a.m. – 8.50 a.m.                     | Arrival and Registration                                                       | <b>Irene Mwangi</b><br><i>BPS Secretariat</i>                                       |
| 8.50 a.m. – 8.55 a.m.                     | Opening Prayer                                                                 | <b>Participant</b>                                                                  |
| 8.55 a.m. – 9.05 a.m.                     | Welcome and Introduction of Participants                                       | <b>Prof. Nancy Budambula</b><br><i>Director, BPS</i>                                |
| 9.05 a.m. – 9.10 a.m.                     | Remarks                                                                        | <b>Prof. Kiplagat Kotut</b><br><i>Deputy Vice-Chancellor (ARE)</i>                  |
| 9.10 a.m. – 9.25 a.m.                     | Remarks and Official Opening                                                   | <b>Prof. Daniel Mugendi</b><br><i>Vice-Chancellor,<br/>University of Embu</i>       |
| 9.25 a.m. – 9.40 a.m.                     | An Introduction of the Workshop                                                | <b>Prof. Nancy Budambula</b><br><i>Director, BPS</i>                                |
| 9.40 a.m. – 10.30 a.m.                    | The Research Proposal (Introduction, Literature Review, Materials and Methods) | <b>Dr. Romano Mwirichia</b><br><i>Director, Research and Extension</i>              |
| <b>10:30 a.m. – 11.00 a.m.</b>            | <b>HEALTH BREAK</b>                                                            | <b>CATERING</b>                                                                     |
| 11:00 a.m. – 11.30 a.m.                   | Planning and Systematic Data Collection                                        | <b>Dr. Julius Mugweru</b><br><i>Lecturer, Department of<br/>Biological Sciences</i> |
| 11.30 p.m. – 12.10 p.m.                   | Data Analysis I                                                                | <b>Dr. Robert Mathenge</b><br><i>Lecturer, Department of Physical<br/>Sciences</i>  |
| 12.10 p.m. – 12.25 p.m.                   | Plenary                                                                        | <b>Dr. Samuel N. Kariuki</b><br><i>CoD Business and Economics</i>                   |
| 12.25 p.m. – 1.00 p.m.                    | The Results Chapter                                                            | <b>Prof. Nancy Budambula</b><br><i>Director, BPS</i>                                |
| <b>1:00 p.m. – 2:00 p.m.</b>              | <b>HEALTH BREAK</b>                                                            | <b>CATERING</b>                                                                     |
| 2:00 p.m. – 2.45 p.m.                     | Data Analysis II                                                               | <b>Dr. Robert Mathenge</b><br><i>Lecturer UoEm</i>                                  |
| 2.45 p.m. – 3.15 p.m.                     | The Discussion Chapter                                                         | <b>Prof. Nancy Budambula</b><br><i>Director, BPS</i>                                |
| 3.15 p.m. – 3.30 p.m.                     | Plenary Discussion                                                             | <b>Dr. Samuel N. Kariuki</b><br><i>CoD, Business and Economics</i>                  |
| 3.30 p.m. – 4.00 p.m.                     | Thesis Writing and Examination                                                 | <b>Prof. Nancy Budambula</b><br><i>Director, BPS</i>                                |
| 4.00 p.m. – 4.15 p.m.                     | The Abstract                                                                   | <b>Prof. Kiplagat Kotut</b><br><i>Deputy Vice-Chancellor (ARE)</i>                  |
| 4.15 p.m. – 4.30 p.m.                     | Closing Remarks                                                                | <b>Prof. Kiplagat Kotut</b><br><i>Deputy Vice-Chancellor (ARE)</i>                  |
| 4:30 p.m. – 4:35 p.m.                     | Closing Prayer                                                                 | <b>Participant</b>                                                                  |
| <b>4.35 p.m.</b>                          | <b>HEALTH BREAK</b>                                                            | <b>CATERING</b>                                                                     |
| <b>PARTICIPANTS LEAVE AT OWN PLEASURE</b> |                                                                                |                                                                                     |

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## TABLE OF CONTENTS

|                                                                                                             |    |
|-------------------------------------------------------------------------------------------------------------|----|
| WORKSHOP PROGRAMME .....                                                                                    | 2  |
| EXECUTIVE SUMMARY .....                                                                                     | 5  |
| INTRODUCTION OF PARTICIPANTS .....                                                                          | 6  |
| WELCOME REMARKS BY DEPUTY VICE-CHANCELLOR (ACADEMICS, RESEARCH AND EXTENSION) .....                         | 6  |
| INTRODUCTION TO THE WORKSHOP .....                                                                          | 7  |
| PRESENTATIONS.....                                                                                          | 8  |
| THE RESEARCH PROPOSAL (INTRODUCTION, LITERATURE REVIEW, MATERIALS AND METHODS) BY DR. ROMANO MWIRICHIA..... | 8  |
| OBSERVING ACADEMIC RIGOUR/PLANNING AND SYSTEMATIC DATA COLLECTION BY DR. JULIUS MUGWERU .....               | 10 |
| DATA ANALYSIS PART 1 BY DR ROBERT MATHENGE .....                                                            | 11 |
| DATA ANALYSIS PART 2 BY DR ROBERT MATHENGE .....                                                            | 13 |
| THE RESULTS CHAPTER BY PROF. NANCY BUDAMBULA .....                                                          | 14 |
| THE DISCUSSION CHAPTER BY PROF. NANCY BUDAMBULA.....                                                        | 15 |
| THESIS WRITING AND EXAMINATION BY PROF. NANCY BUDAMBULA.....                                                | 16 |
| THE ABSTRACT BY PROF. KIPLAGAT KOTUT .....                                                                  | 18 |
| PLENARY SESSION.....                                                                                        | 19 |
| VOTE OF THANKS.....                                                                                         | 21 |
| CLOSING REMARKS BY DEPUTY VICE-CHANCELLOR (ACADEMICS, RESEARCH AND EXTENSION) .....                         | 21 |
| LIST OF PARTICIPANTS .....                                                                                  | 22 |
| APPENDICES.....                                                                                             | 24 |

## EXECUTIVE SUMMARY

The Second Proposal and Thesis Writing Workshop was held on 26<sup>th</sup> April 2018 in the Charter Hall at the University of Embu (UoEm). The workshop aimed to equip postgraduate students with the skills required for proposal and thesis writing. It brought together 143 participants comprising senior university management, members of Senate, academic staff and postgraduate students from the Schools of Agriculture, Pure and Applied Sciences, Business and Economics as well as Education and Social Sciences. The workshop covered the chapters of the research proposal and thesis namely; introduction, literature review, materials and methods, data collection and analysis, results and discussion as well as examination of thesis. The workshop was officially opened by Prof Daniel Mugendi Njiru, the Vice-Chancellor of the University of Embu. In his opening remarks, the Vice-Chancellor noted that universities were not producing postgraduates fast enough to meet the requirements of the country. He also noted that the Commission for University Education (CUE) had recommended postgraduate examination focuses on publication by the student as well as special and intensive training of postgraduate students on proposal writing. This workshop was therefore part of the effort to improve the quality and number of postgraduate students. The VC recounted with pride that in 2016/2017 four PhD students from UoEm wrote good proposals that were funded by the National Research Fund (NRF). He was hopeful more students would be funded in the 2017/2018 year. The VC emphasized the commitment of the management of UoEm to provide quality postgraduate education. During the workshop, postgraduate students requested for increasing the number of research laboratories in the University, increasing access to other research facilities and additional training on data analysis. In his closing remarks, the DVC (ARE) emphasized that every postgraduate student in UoEm has the right to choose their supervisor. Therefore no one should force a supervisor on a student. The Workshop was facilitated by; Prof Kiplagat Kotut the DVC (ARE), Prof. Nancy Budambula the Director Board of Postgraduate Studies, Dr Romano Mwirichia the Director Research and Extension, Dr Robert Mathenge Lecturer at UoEm and Dr Julius Mugweru Lecturer at UoEm.

## **INTRODUCTION OF PARTICIPANTS**

The Director, Board of Postgraduate Studies, Prof. Nancy Budambula, introduced the participants by schools, the Board, the Secretariat, then the facilitators; Prof Kiplagat Kotut, Prof. Nancy Budambula, Dr Romano Mwirichia, Dr Robert Mathenge, and Dr Julius Mugweru. She welcomed the Deputy Vice Chancellor in charge of academics, research and extension to give welcome remarks and invite the Vice Chancellor to open the Workshop.

## **WELCOME REMARKS BY DEPUTY VICE-CHANCELLOR (ACADEMICS, RESEARCH AND EXTENSION)**

Prof Kiplagat Kotut the DVC (ARE), in his welcome remarks observed that often postgraduate students finish course work on time but not the research work. Perhaps this could be attributed to:

- 1) The trauma of coursework and examination, thus the need to rest and recover.
- 2) Lecturers could be preparing students well for course work and but not for research.
- 3) Freedom and confusion associated with identifying a problem for the project work.

The DVC hoped that the workshop would help to address the challenges and avoid pitfalls that are likely to come on one's way, and would help the students to strategize and navigate through research. The Deputy Vice-Chancellor then invited the Vice-Chancellor to address the participants and open the Workshop.

## **VICE-CHANCELLOR'S SPEECH DURING THE SECOND PROPOSAL AND THESIS WRITING POSTGRADUATE WORKSHOP**

The Vice-Chancellor (VC) of the University of Embu, Prof Daniel Mugendi Njiru, welcomed all participants to the workshop. He noted that according to CUE, national statistics indicate that only 11.6% of graduating students graduated with masters' degrees while only 0.6% graduated with PhD degrees. This supply is not enough to meet the demand as about 10,000 new staff with PhD degrees are required to serve in the 70 or so universities operating in Kenya but only 7% are produced annually. To improve the quality and number of postgraduate students, CUE has recommended examination of postgraduate students focuses on publication by the student, training of postgraduate students on proposal writing, increasing HELB funding for postgraduate students, increasing government and bilateral scholarships for postgraduate students and increasing research funding including postgraduate research funding.

The VC observed that a healthy relationship between the student and supervisor is key to the success of postgraduate research. He further narrated his experience as an MSc student at the University of Nairobi and as a PhD student in the USA. The VC stated that he would want to make the postgraduate experience in UoEm the best in the Kenya. In relation to hurdles that students may experience, the management of UoEm exercises an open-door policy. The VC reiterated that UoEm Management was committed to support the growth of postgraduate studies in the university. The management had demonstrated this by; providing research laboratories, a modern library, e-resources, quality and competent supervisors, awarding 25 scholarships in the last year as well as organizing workshops and seminars like this where students can be trained as well as meet and share ideas and experiences with role models and mentors.

The VC stated that the aim of this workshop is to equip postgraduate students with the skills required for writing the research proposal, analyzing data, writing the thesis and thereby graduate on time. After making these remarks the VC declared the second Proposal and Thesis Writing Workshop officially opened at 9.39 am. The full speech by the VC is provided as Appendix 1.

## **INTRODUCTION TO THE WORKSHOP**

The Director, Board of Postgraduate Studies, Prof. Nancy Budambula, gave a brief overview of the workshop. She called upon PhD students who have been offered substantive admission to enroll and pay fees. The Director encouraged participants to visit the BPS website, read FAQs and corresponding answers. The Proceedings of the First Workshop Proposal and Thesis Writing Workshop held in July 2015 are on the BPS website and can be downloaded. The Director reminded the students that they need to submit progress reports on time, present progress seminars and attend seminars in different departments in the University. To graduate in September, students should aim to have submitted the thesis or project report work for examination by June.

The Director recounted that the First Proposal and Thesis Writing workshop held in 2015, had been dominated by student-supervisor relationship. Consequently, a workshop to sensitize supervisors and academic staff on effective postgraduate supervision, mentoring and examination had been held in December 2016. She advised postgraduate students to choose supervisors carefully as postgraduate research and writing was a long journey. The Director reminded the students not to be the student every supervisor doesn't want to have. The Director narrated her

experience of her postgraduate studies and the genesis of her high expectations from students.

The Second Proposal and Thesis Writing workshop was structured to revolve around Thesis Chapters/Research Report Chapters (for project students) as follows:

1. Introduction- also in proposal
  2. Literature Review –also in proposal
  3. Materials and Methods/Methodology-also in proposal
  4. Results
  5. Discussion
- Referencing  
The Abstract

The Director noted that at UoEm, so far, data collection and data analysis had been most the most challenging. Therefore, a considerable proportion of the workshop time would be spent on data collection and data analysis (see Appendix 2).

## **PRESENTATIONS**

### **THE RESEARCH PROPOSAL (INTRODUCTION, LITERATURE REVIEW, MATERIALS AND METHODS) BY DR. ROMANO MWIRICHIA**

Dr Mwirichia began by reminding the participants that if you cannot paste properly don't copy. It's about proper preparation as you write. When a supervisor makes a comment or correction consider it, stop saying *naonewa* (I am being picked on).

#### **What is a research proposal?**

It is something new not copied; it contributes to knowledge and is original. A project proposal should:

- Have defined clear research questions and approaches to finding an answer.
- Show originality or significance e.g. when submitting it to funding agency convincing them that it is really a problem and you are the best in solving it in your project.
- Persuade the reader on the importance of your work.

#### **Why we write?**

We must first have a good idea since a good project stems out of a good idea. A good idea comes from familiarity with the topic. One should research the idea such that he

knows it well. The proposal should help to estimate the size and duration of the project. A good idea is well synthesized. Read almost everything that is available that surrounds your topic. One needs to dedicate time and be fully committed to have the idea.

## **Proposal outline**

### **Topic**

Should be general but interesting enough to attract attention. It should be precise but informative enough to indicate the problem. The proposal outlines what you are going to do, when and how. The title should be concise, around 20 words and not longer.

### **Introduction**

The introduction gives the reader background knowledge on what is going to be done. It shows what problem is going to be investigated, the research gap and this is not the place to throw in all the complex words. The introduction links existing knowledge in the area and how it relates to what we know so far. It addresses the research gap (aim of project), what is the hypothesis, what methods are to be used and what are the expected results and relevance. **Aim** (this is the target of your research)

### **Objectives**

They have to be **SMART**

**S** - Specific and precise (to the point)

**M**- Measurable

**A**- Achievable within project's duration (PhD 3 years, Master's 2years)

**R**- relevant with regard to research aim

**T**- Time bound such that they are done within the set time frame

### **Literature review** (state of knowledge in the context of the proposed work)

Should be up to date. Therefore read, synthesize and evaluate relevant existing literature. Highlight what has been done in that area as it sets the stage for your work. Information should flow from general to more focused studies relating to the topic. Identify the gaps in knowledge and the gaps to be filled by your research. Preliminary studies establish feasibility of your research. One needs to read a lot and cite the latest literature and references. He emphasized on current references being important to support the proposed research.

### **Methodology: methods and procedures etc.**

It is guided by objectives. It should show how one can get to where you have indicated as the destination. Spell out the methods by which you purpose to achieve the

objectives. Objectives must be logical and realistic. It is the procedure to research your problem.

### **Data collection:**

Think of what you require for example do you need government or ethical permits? What is your field site? What type of data do you anticipate to collect? Anticipate eventualities and problems you are likely to encounter. Address how you are going to address them and overcome them. Identify and confirm availability of the instruments or equipment required. The detailed presentation is attached as Appendix 3.

## **OBSERVING ACADEMIC RIGOUR/PLANNING AND SYSTEMATIC DATA COLLECTION BY DR. JULIUS MUGWERU**

Everyone joins postgraduate studies for various reasons in mind including enthusiasm, desire to work in teams, self-improvement accomplishment among others. The journey is not enjoyable all the time but you will become happy after it is done. Enjoyment comes after you have accomplished.

### **Phenomena of Postgraduate Studies**

**Imposter syndrome:** (don't be little yourself with this syndrome). This is cured by developing and building knowledge and by being patient with yourself. It takes time to do it. Cultivate academic humility and remember 'EGO' is an enemy to progress. Avoiding brushing off even those who are below you. As you move up, you will have more responsibilities. Stop complaining about reviewers since they want to improve your work. Learn to manage pressure as it will be high. In addition, learn to talk and to seek help.

**Mental health:** Talk to people, seek help when in difficult circumstances and get enough sleep.

**Advisory role:** Talk freely with your advisors about your career goals. Meet your advisor with a clear agenda. Start with the most sensitive agenda for instance when you meet up with your supervisor let them know what you like and what you don't like. Don't write your advisor more than two paragraphs of email instead talk with them over it.

**Work life balance:** Strain yourself only when there are big dealings.

**Rejection and Competition:** Rejection in academics is not personal. Move on and keep calm. Sit down with your supervisor and see how you can improve your work. Your work must be subjected to peer review, analysis and criticism among others. Other peoples' success is not your failure. Learn not to compete with your peers. Success in academia hinges upon long term collaborative work.

**Conferences, Seminars and Workshops:**

You need to attend them since this is where you meet with experts and who can improve you. Attending conferences helps you learn how to give talks (every talk is a job talk). When you are to give a talk; rehearse your talk, don't read scripts and don't use transitions.

**Software, Organization and Statistics:**

Start learning how to use software such as excel familiarize yourself with open science, avoid questionable research practices and back up your files. Have an open note book to collect your raw data that support your work. Write in it what you do every day. Every day add to your manuscripts and back up.

**Organization:** Do citation electronically, use citation software Medleys, Zotero etc. Keep your files organized. Each project should have its own folder.

**Digital networking:** Create your online presence, create your blog and make yourself known. Make a point to join academic twitter. You tube is a very helpful learning tool. Take and learn the tutorials from YouTube. Other platforms are ORCID, research gate. Details of this presentation are in Appendix 4.

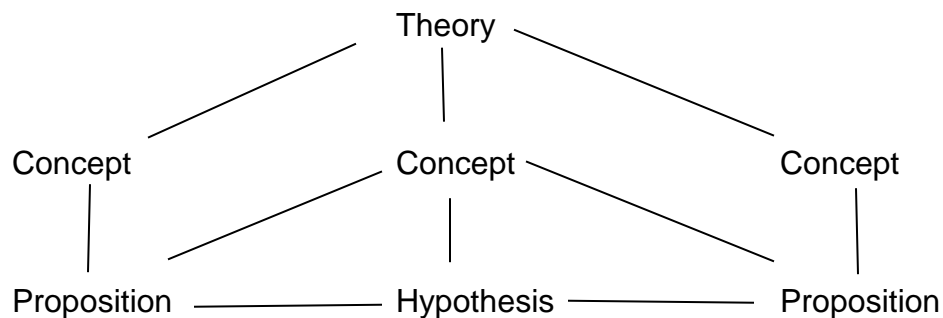
**DATA ANALYSIS PART 1 BY DR ROBERT MATHENGE**

A theory is a set of interrelated constructs, definitions and positions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena. Constructs are concepts adopted for a specific purpose. Through research, scientists can develop, modify or evaluate theories. In your research you will come across various theories but endeavor to generate new theories (Knowledge). Theories are generated by use of indicative process. The constructs provide the pillar of what you want to generate.

**Theoretical framework**

It provides a context in which we can formulate the conceptual framework

## Process of hypothesis generation



**Testing hypothesis:** Involves selecting the individual subjects to participate in the study, using instruments that will validly and reliably measure the variables, developing a method of systematically collecting the information needed to test hypothesized relationship, selecting statistical measures that will determine the extent or meaning or significance of relationship (select a statistical measure that relates to your theory).

### The use of a theoretical frame work as a guide in a research study

Your research study must be supported by theory. How to develop a theoretical framework. The first step is to select a concept. A concept is an image or symbol that you can use to measure. For example, to estimate thirst you will need to measure quantity of water consumed not how thirsty one is. Some concepts are easily defined in operational terms. Other concepts are more difficult to define in operational terms.

### Types of theories and researches

Theories may describe a phenomenon, explain relationships between or among phenomena and they include; descriptive theories- they describe phenomena, explanatory theories- specify relationship among dimension and predictive theories- intend to predict phenomena and are tested using experimental designs.

### Conceptual framework

Explains either graphically or in narrative form the main thing to be studied. Each concept has independent, moderating and dependent variables. The moderating variable moderates the independent and dependent variables. The moderating variable influences the two.

## **Operationalization of variables**

Imprecise variable which cannot be measured are broken down into observable behavior characteristics; define the construct to measure, content of measure and design response format for example the use of Likert scale. Software are used to increase reliability of a construct for example it shows how we can delete some questions in our questionnaire to increase reliability such as by 5%. The detailed presentation is available as Appendix 5.

## **DATA ANALYSIS PART 2 BY DR ROBERT MATHENGE**

Before carrying out any data analysis, prepare data analysis plan from your objectives and hypothesis to determine the method of analysis. If your research design is descriptive, perform a descriptive analysis and report the findings.

Carry out exploratory data analysis before fitting any model to gain the following; maximum insight into data set, uncover underlying structure, extract important variables, detect outliers and anomalies, test underlying assumptions, develop parsimonious models, develop a good model for your data and determine optimal factor data setting.

Check whether the data is skewed. A regression model assumes error and data is not normally distributed. Common descriptive statistics are: Frequency tables, percentages, numbers. Summary statistics; mean, mode, median, maximum and minimum. Variability; variance and standard deviation, coefficient of variation. Correlation analysis; test correlation between x and y- variables. Contingency analysis; test association between two variables.

### **Graphic techniques for Exploratory Data Analysis (EDA)**

Graphical techniques applied for EDA are quite simple and consists of various techniques. This can be done by using histograms or simple statistics e.g. mean.

### **Philosophy of Data Analysis**

For classical analysis, the sequence is: Problem> Data> Model> Analysis> Conclusion

For EDA, the sequence is: Problem> Data> Analysis> Model> Conclusions

For Bayesian, the sequence is: Problem> Data> Model> Prior distribution> Analysis> Conclusion

### **Models**

A model is a representation of the most important elements of a perceived real-world system. For instance,  $Y=B_0+Bx_i+Error$ . Where  $B_0$ -Intercept,  $B$ -coefficient,  $X_i$ -Independent variable. If data is not normal there is no need of doing a regression.

## Major methods of statistical analysis for response and explanatory variables measured on various scales.

| Dependent variable        | Method                                    |
|---------------------------|-------------------------------------------|
| 1. Binary                 | t- test (to compare two groups)           |
| 2. Normal                 | ANOVA                                     |
| 3. Ordinal                | ANOVA                                     |
| 4. Continuous             | multiple regression                       |
| 5. Nominal and continuous | analysis of co-variance                   |
| 6. Categorical            | contingency tables<br>logistic regression |

The detailed presentation is available as Appendix 6.

## THE RESULTS CHAPTER BY PROF. NANCY BUDAMBULA

The chapter on results the most important chapter in the thesis/research project report from the examiners perspective. A results chapter is not; a photo album, collection of figures or tables or bar graphs and percentages or a repeat of methodology.

### What is the results chapter?

The results chapter is the backbone of the thesis and carries the findings of the study. It is the longest part of the thesis, which is about 30 to 40 percent of the entire thesis. Data must be analyzed and findings of the study must be communicated to the reader in this chapter. The results chapter generates the publication and is often the basis on which thesis is judged. It must be well written and communicate to the reader.

### Important aspects of the Results chapter

The results chapter should communicate the research design, appropriate tools for analysis. The chapter should answer the questions: Is the data from an appropriate sample size? Population must be adequate and statistically sound. If data is not statistical, what is the appropriate tool for analysis? What is the gold standard in your discipline? Can the data be replicated? The chapter should provide data on control group, measure the control to make it convincing. When using software, identify the statistical basis on which it was derived and how you used it. An experiment with no control is invalid.

### Clarity and detail in reporting the results

State results, then support the results with an illustration (tables, plates, figures). Illustrations must: Be introduced before they appear; Be of good quality; Be able to

stand alone; Should appear immediately they are mentioned on the same page or next page. Quantify results (avoid using 'very much' or 'most' or few). Report results objective by objective. Avoid too many repetitive illustrations that can be synthesized into one, in some cases combine tables and graphs. Tables should not be on too many pages. Move large tables to the appendices.

### **Invest in preparing the results chapter**

Do not write a hurried addendum to the research proposal and assume it is a results chapter. Refer to journals that have published similar work and examine the methods used in analysis and the style of reporting the results. Postgraduate students are expected to go beyond bar charts and percentages. Make deliberate efforts to find tools that have been used to synthesize the data in other studies. Attend short courses to learn how to analyze data and use applicable software. For more details on this presentation see Appendix 7.

## **THE DISCUSSION CHAPTER BY PROF. NANCY BUDAMBULA**

As a thesis examiner, the presenter noted that most students do not write a discussion chapter. Students often present something that is not a discussion, repeat the results or methods, provide a list of similar studies/ repeat literature review, provide a list of authors who did previous work or write hurriedly. The Discussion Chapter is the most important part of the thesis after results. It carries the 2<sup>nd</sup> highest proportion of marks after results.

The discussion chapter interprets the results without repeating the results chapter, provides opportunity to show mastery of the subject and to demonstrate your contribution to knowledge. In a defense it must be clear how your discussion contributes to knowledge. The chapter should not be less than 10 pages for masters and 20 pages for PhD level. Structure your discussion to address the objectives of research.

### **Conclusions**

A discussion is incomplete without conclusions. Based on the data obtained, draw a conclusion for each objective. For compound objectives, two or three conclusions can be drawn based on your conclusions. Do you accept or reject the hypothesis?

### **Recommendations**

They must be directed to someone or a group such as policy makers, researchers. They are based on your objectives. After drawing conclusions, make

recommendations. Do not make too many recommendations that could suggest that you did not do your work

### **Never write**

No postgraduate student worth his/her salt should ever have this kind of statements in the discussion:

- Budambula (2009) said
- Maina (2012) also said
- Another researcher Otieno in (2011) said
- According to Koech and Wafula (2015)
- Researchers in India Patel and Shah (1980) said

Postgraduates must demonstrate ability to write correct English statements.

### **Remember:**

- Referencing must be done well and be sure it will be checked by examiners. Do not blame software e.g. plagiarism
- Appendices are part of the thesis and must be well done with appropriate titles or legends.

### **Thematic thesis**

The thematic thesis is acceptable at UoEm, especially for PhD. It is expected to have.

- General introduction chapter
- Thematic chapters -each chapter with its literature review, materials and methods, results, discussion
- General discussion/Synthesis chapter
- Referencing

For more details on the discussion Chapter see Appendix 8.

## **THESIS WRITING AND EXAMINATION BY PROF. NANCY BUDAMBULA**

Prof Budambula started her presentation by emphasizing that thesis writing or project report writing must be deliberate, systematic, planned and continuous. The best approach is to write and add to your thesis everyday as you collect data. To be a good writer you must be a good reader. Reading is a must for good writing. Pay attention to style grammar, punctuation and details. Learn from others, read articles from peer

reviewed journals. As you write, read and compare your findings with what has been published in the area.

### **Personal perspectives on thesis writing**

From the experiences of the presenter as a supervisor and examiner start writing the thesis with the results chapter, guided by objectives. Do not waste much time on the introduction, literature and methods as they have already been reviewed at the proposal stage. Once you have written the results chapter, start converting it into a manuscript(s) for publication. For PhD, once you write results for an objective, convert to manuscript(s) and submit for publication. Publish objective by objective. Every time you get reviewers comments on the manuscript, also make corrections in the thesis. After writing the results chapter write the discussion chapter. During this process immerse yourself in reading and reading. Harmonize the chapters to avoid disconnected/patch work. Avoid the temptation to attach results and discussion to the old proposal and submit for examination. Generally accepted that B.Sc. project report (25- 50 pages), Masters thesis/ project report (50-100 pages) and Ph.D. thesis (100-200 pages). The abstract is what is written last. Sometimes to write one has to fast from normal way of life at this time, sacrifice, retreat from daily routine, set and pursue clear targets. For a student who has worked consistently, a master thesis should take 6 weeks- 2 months to write while the PhD should take 2 to 3months to write thesis. Identifying a problem and setting good objectives is key to having a good thesis.

### **Examination of the thesis/project report**

One must prepare well for the final examination. If you are lazy, please note that examiners are not lazy. Avoid annoying the examiners. The Thesis Defense is serious examination. One must be well prepared, alert and articulate. One must focus on the results and their interpretation/discussion. At defense one must demonstrate mastery of subject and new contribution to science/knowledge

#### Possible defense outcomes

1. Award without correction.
2. Award subject to minor corrections –resubmit 3 to 4 months for master /PhD no new examination required.
3. Award subject to major corrections –resubmit 3 to 6/ 4 to 8 months for master /PhD no new examination required.
4. Revise and resubmit for examination 6/8 -12 months for master/PhD dangerous place to be.
5. Do not award.

Aim to finish in category 1 and 2. Embrace corrections and do them, examiners have long memories. Details on thesis writing and defense are in Appendix 9.

## **THE ABSTRACT BY PROF. KIPLAGAT KOTUT**

A winning Abstract demonstrates academic excellence. It is a summary of a research articles, thesis, review, conference proceeding among others. An Abstract presents all the major elements of one's work in a highly condensed form. It is presented at the beginning of a thesis or publication and it is likely the first substantive description of your work read by any person interested in your work.

### **Major components of an abstract**

**From the introduction:** The question you investigated or source, have one statement on the background and purpose of this study. State the purpose very clearly in the 1<sup>st</sup> or 2<sup>nd</sup> sentence. A thesis abstract is a bit longer than a paper abstract.

**From methodology:** The experimental design and methods used. Clearly express the basic design of study. Name or briefly describe the basic methodology used without going into too much detail.

**From results:** The major findings including key questions you asked. Identify trends, relative change or difference etc. Avoid being emotional in results, report them as they were.

**From discussion:** A summary of your interpretations and conclusions should be clearly stated.

**Key words:** Capture the most important aspects of your work.

Information given in the Abstract must be in one paragraph.

### **Recommended steps to writing an abstract**

- Take whole sentences or key phrases from each section and put them in a sequence which summarizes the paper.
- Revise them and make a summary
- Once you have the complete abstract check to make sure that the information in the abstract completely agrees with what is written in the paper.
- Confirm all information appearing in the abstract.

### **Determining if the abstract written is adequate**

Assume you are another researcher in the same field and that the abstract is the only part of the paper. Is the amount of the information presented adequate?

### **Length of abstract**

Depends on different disciplines. It should be kept between 200-300 words maximum. Most journals prescribe the length of the same. Although the abstract is written last, it comes first in your report, thesis or publication. Use concise, but complete sentences and get to the point quickly. Use past tense for thesis, report or publication. The proposal abstract should be written in future tense.

### **What to avoid in your abstract**

- Lengthy information.
- Abbreviations and jargon.
- Any sort of illustration and references should not be put in the abstract.
- Long confusing sentences.
- Images.

The full presentation on writing an abstract is attached as Appendix 10.

## **PLENARY SESSION**

**Does the University allocate supervisors?** The university does not allocate supervisors. The students are advised to choose supervisors carefully. Students should also expect to work. The consensus is that staff should distribute students among themselves in a fair manner so that the younger staff members can also grow academically.

### **Was it necessary to teach social science methods of data analysis to science students?**

Agriculture and biology students need to know about some of the methods such as the Likert scale and use them. It is not only important for business students but for all of us.

**Can the workshop material be availed to students?** Yes, this will be done but with caution to protect intellectual property of the University and facilitators.

**Can the standard on the expected standard of writing be relaxed (*kulegeza Kamba*)?** It was clarified now that the students have been trained, there will be no relaxing (*Hakuna kulegeza Kamba*) as UoEm aims to attain international standards.

**Can further training on data analysis be provided?** Dr Mathenge offered himself to teach a short course in June on data analysis.

**What is the status of Library services?** The Deputy Librarian confirmed that the library had moved to the new building and they offer the same services e.g. borrowing books etc.

**Should a thematic chapter have a conclusion?** Yes, each chapter should have a conclusion as it concludes an objective.

**It is possible to have this workshop every semester even though we pay for it?** The Director, BPS observed that though it is a good idea, it might not be possible to have the workshop every semester at the University level due to the logistics involved. However, this workshop can be devolved to the School and Departmental level where it can happen every semester. For example, there can be training for students in the Department of Business and Economics so that they can understand the theoretical and conceptual frameworks.

**Can access to laboratories be granted on the weekend? This is the only time working students can access the laboratories.** Access during weekends will be pursued with university management.

**Is it possible to bypass permission procedure to get to access the laboratories when you are a student?** Controlled access to laboratories is the international good practice. Access to laboratories still needs to be controlled even in a research institution laboratory access is controlled. However, there is need to make it less bureaucratic.

**Can we have more research laboratories in the institution?** The university is considering that matter.

**Compliment.** Ms Eunice Wangari complimented the University in helping postgraduates to work on their proposal and urged students to work hard.

**What are the differences between the theoretical framework and conceptual frameworks?** Dean, School of Business elaborated on the differences between the theoretical framework and conceptual framework. He commented on how to come up with equations from the theoretical and conceptual frameworks. Not just throwing in equations without any support from the above frameworks.

**Compliment.** Mr Mwenda, a PhD student, complimented the institution on how fast students are called for defense (2 weeks).

**How do we place arrows while inferring to variables?** Dr. Mathenge explained how moderating variables affect both dependent and independent variables.

**Can results and discussion chapters can be combined?** It is not a good idea since some students don't discuss the results. However, when the discipline or journal requires they are combined, the discussion points must come out clearly.

**Grammar and Editing.** It was emphasized that simple grammatical errors and punctuation must always be checked including the commas and full stops before a thesis or project report is submitted for examination.

**Can the University avail statistical software?** Many software programs are expensive. Director BPS indicated that the Board would push for this matter to be addressed.

## **VOTE OF THANKS.**

**Vote of thanks** was given by Mr. Rosalucy Nyaga, PhD student, School of Business and Economics.

## **CLOSING REMARKS BY DEPUTY VICE-CHANCELLOR (ACADEMICS, RESEARCH AND EXTENSION)**

Prof Kiplagat Kotut, the DVC (ARE), Prof. Kotut closed the workshop with the following observations:

1. No one will force you to drink water after taking you to the river.
2. Do it for not only yourself but also for your teachers and lecturers.
3. Every postgraduate student has the right to select their supervisor. No one should force a supervisor on a student.
4. Additional research laboratories will be constructed after completion of the tuition block.
5. Deans to hold workshops at School level to address more discipline specific issues.

### **Closing prayer**

The closing prayer was offered by Mr Paul Waweru, MSc student, School of Agriculture.

The workshop ended at 5.04pm.

## LIST OF PARTICIPANTS

1. Prof. Daniel Mugendi
2. Prof. Kiplagat Kotut
3. Prof. Nancy Budambula
4. Dr. Paul Nthakanio
5. Ms. Margaret Otolo
6. Dr. Jackson Wachira
7. Dr. Eric Wangila
8. Dr. Samuel Kariuki
9. Dr. Samuel Ndirangu
10. Dr. Romano Mwirichia
11. Mr. Charles Onyari
12. Dr. George Nyamato
13. Dr. Duncan Mugambi
14. Dr. Julius Mugweru
15. Dr. Kennedy Ocharo
16. Dr. Robert Mathenge
17. Dr. Justin Nyaga
18. Ms. Jacqueline Nteere
19. Mr. Alex Kipnyargis
20. Mr. Simon Mugo
21. Ms. Anne Kairu
22. Ms. Nashebanda Jean
23. Ms. Emise Kageni
24. Mr. Kelvin Njuguna
25. Mr. Francis Murage
26. Mr. Peter Shinga
27. Mr. Jeff Kimanga
28. Ms. Rosalucy Nyaga
29. Mr. Francis Kadipo
30. Ms. Susan Gachora
31. Ms. Miriam Mochache
32. Mr. Samuel Maina
33. Mr. Stephen Muia
34. Mr. Jared Anyona
35. Mr. Ercik Otieno
36. Ms. Mary Kawira
37. Sr. Bibiana Ileri
38. Ms. Maryanne Mucheru
39. Mr. Isaac Kibet
40. Mr. Alexander Kanyi
41. Ms. Janice Nyaga
42. Ms. Pauline Micheni
43. Ms. Mary Wanjiru
44. Mr. Francis Lekololi
45. Mr. Edwin Ngetha
46. Mr. Musyoka Kinyili
47. Mr. Stephen Kariuki
48. Ms. Eunice Wangari
49. Mr. Samwel Symekher
50. Mr. Eliud Kagete
51. Mr. Francis Kirega
52. Mr. Peter Njeru
53. Ms. Mercy Wanja
54. Mr. Joseph Makau
55. Ms. Linda Kawira
56. Mr. Edwin Serem
57. Mr. Moses Kariuki
58. Mr. Peter Mwakio
59. Mr. James Muchoka
60. Ms. Sayo Sussy
61. Ms. Emily Wekesa
62. Ms. Janefreey Wanyoike
63. Ms. Veronicah Nyokabi
64. Mr. Paul Njeru
65. Ms. Grace Ndiritu
66. Mr. Okeyo Odhiambo
67. Ms. Purity Chege
68. Mr. Thomas Mwangi
69. Mr. Daniel Musau
70. Mr. Joshua Muli
71. Ms. Grace Kinyanjui

72. Ms. Hellen Maina  
73. Mr. Peter Kinuthia  
74. Mr. Njeru Kanga  
75. Mr. Justus Mukavi  
76. Mr. Paul Waweru  
77. Ms. Irene Kageni  
78. Ms. Elizabeth Gitonga  
79. Ms. Jane Omenda  
80. Ms. Cecily Wamuuru  
81. Ms. Beatrice Njogu  
82. Ms. Jennifer Jepkoech  
83. Ms. Veronica Wambura  
84. Mr. Raboc Nelvin  
85. Ms. Hellen Njura  
86. Mr. Samuel Ngigi  
87. Ms. Grace Muthoni  
88. Mr. Kaviatu Giochi  
89. Mr. David Njue  
90. Mr. Newton Nyaga  
91. Ms. Susan Wairimu  
92. Ms. Tarsianer Peter  
93. Ms. Josphine Mbwiria  
94. Mr. Philemon Orwa  
95. Mr. Eliud Ndungu  
96. Ms. Grace Wambui  
97. Ms. Victoria Nyaga  
98. Ms. Beatrice Nganga  
99. Ms. Mpuhia Nkatha  
100. Mr. Robert Kasyoka  
101. Mr. Samson Murithi  
102. Ms. Grace Wanja  
103. Mr. Nelly Nabulu  
104. Mr. George Kiragu  
105. Ms. Judith Wafula  
106. Mr. George Gachoki  
107. Mr. Tetu Mutegi  
108. Mr. Peter Njagi  
109. Ms. Eunice Koskei  
110. Mr. William Kinyua  
111. Mr. Denis Kiplimo  
112. Ms. Grace Munene  
113. Ms. Florence Kaumi  
114. Mr. Justine Miriti  
115. Ms. Peris Nderitu  
116. Ms. Faith Mueni  
117. Mr. Zabed Muringi  
118. Ms. Jane Kiarie  
119. Ms. Lilian Nyaga  
120. Ms. Joan Muketha  
121. Mr. Justus Mwenda  
122. Mr. Njuki Nthimba  
123. Ms. Daisy Ireri  
124. Mr. Peterson Mutembei  
125. Mr. Benard Cheruiyot  
126. Ms. Eunice Ruraa  
127. Mr. Isaiah Mbogo  
128. Ms. Loise Makunyi  
129. Mr. Antony Kimani  
130. Mr. Peter Mwangi  
131. Mr. Stephen Murungaru  
132. Mr. James Gathogo  
133. Ms. Ann Kathomi  
134. Mr. Gabriel Samuel  
135. Ms. Irene Mwangi  
136. Mr. Denis Kirega  
137. Ms. Naomi Mwangi  
138. Mr. Peter Osako  
139. Ms. Catherine Wanjiru  
140. Mr. Samuel Irungu  
141. Mr. Martin Kamau  
142. Ms. Evangeline Mueke  
143. Mr. Musafiri Collins

# APPENDICES



## APPENDIX 1: VICE CHANCELLOR'S SPEECH

### SECOND PROPOSAL AND THESIS WRITING POSTGRADUATE WORKSHOP AT THE UNIVERSITY OF EMBU HELD ON 26<sup>TH</sup> APRIL 2018

- Deputy Vice-Chancellors,
- Members of the University Management and Senate,
- Facilitators,
- Academic staff,
- Postgraduate students,
- Ladies and gentlemen.

Good morning.

It gives me great pleasure to be here with you this morning to officially open the Second Proposal and Thesis Writing Postgraduate Workshop at the University of Embu.

National Statistics for 2012 to 2015 indicate:

- ✚ Only 11.6% of graduating students graduated with masters' degrees.
- ✚ Only 0.6% graduated with PhD degrees.
- ✚ About 10,000 new staff with PhD degrees are required to serve in the 70 or so universities operating in Kenya but only 7% are produced annually.

Among recommendations by the Commission for University Education (CUE) to improve quality and number of postgraduate students are:

- Rethink examination of postgraduate students with a focus from examination of thesis to publication by the student.

- Special and intensive training of postgraduate students on proposal writing.
- Increase HELB funding for postgraduate students.
- Increase government and bilateral scholarships for postgraduate students.
- Increase research funding including postgraduate research funding.

Am pleased to note that:

- In 2016/2017 four PhD students from UoEm wrote good proposals that were funded by the National Research Fund (NRF).
- This year, 13 PhD and 6 masters' students submitted proposals to NRF. Am hopeful many of these proposals will be funded.

With a total of 230 postgraduate students at UoEm, I believe we can do better by submitting more proposals to NRF during the next call.

The First Proposal and Thesis Writing Postgraduate Workshop at the University of Embu was held almost three years ago in July 2015. During the 2015 workshop:

- ✚ The student-supervisor relationship dominated the plenary discussions. It was observed that a healthy student supervisor relationship is core to the success of a student's research project.
- ✚ In response to the concerns raised, periodic sensitization on supervision is done. In addition, a workshop for academic staff on effective supervision of postgraduate students was held in December 2016.

## **Commitment of UoEm Top Management to Postgraduate Students**

Top Management of UoEm is committed to providing quality postgraduate training with value for money and time. Some of the efforts by the UoEm include:

- i) Increasing access to postgraduate studies. In 2017/2018 academic year UoEm awarded 25 masters scholarships to students who excelled in their undergraduate studies in the previous academic years.
- ii) Regular training of postgraduate students on proposal writing, thesis writing, data analysis, E-resources and publishing among others.
- iii) Recruiting competent staff with excellent research, publications and student supervision experience.
- iv) Training and sensitization of academic staff on effective supervision and mentorship of postgraduate students.
- v) Setting aside a section of the new University Library for postgraduate students.

### **Focus of this workshop**

The aim of this workshop is to equip you with the skills required for you to write your research proposal, analyze your data, write your thesis and graduate on time.

It is now my pleasure to declare the Second Proposal and Thesis Writing Postgraduate Workshop at University of Embu officially opened.

**Thank you and God Bless you all.**

# **APPENDIX 2**

**Prof Nancy Budambula**

**Director, BPS**

**University of Embu**

**April 2018**

2<sup>nd</sup> Proposal and Thesis Workshop  
University of Embu  
26<sup>th</sup> April 2018

An Overview

Prof Nancy Budambula

Director, BPS

# Announcements

- PhD substantive registration- need to enroll.
- Visit BPS website- FAQ.
- Thesis format –download.
- Proceedings of First Proposal and Thesis Writing Workshop 2015-  
download.
- Progress Reports, Progress Seminars- **across schools & depts.**
- Graduation Timelines.
- Decolonizing Conference-6<sup>th</sup> to 8<sup>th</sup> June- Theme transformative education.
- Annual Postgraduate Workshop coming soon

# Highlights of the First Proposal and Thesis Writing Workshop 2015

- ❑ A Postgraduate Student's Journey From Proposal Through Thesis to Publication.
- ❑ The Thesis Proposal.
- ❑ A General Overview of Contemporary Research Methods: Efficient Research Design, Effective Data Collection Instruments and Attendant Modalities.
- ❑ Thesis Writing.
- ❑ Writing Skills and Presentations .

# Emerging Issues from First Proposal and Thesis Writing Workshop

- The student supervisor relationship dominated the plenary discussions.
- **Recommended** that a workshop be held to sensitize supervisors and all academic staff on effective supervision, mentoring and postgraduate student management.
- Response Postgraduate supervision, mentorship and examination workshop December 2016.
- Echo- How not to be the student every supervisor doesn't want to have.
- Supervisor identification, selection, implication, expectation, personality .
- Proceedings are available on BPS and University Website.

# Second Proposal and Thesis Workshop University of Embu

## Thesis Chapters/Research Report Chapters (for project students)

1. Introduction- also in proposal
2. Literature Review –also in proposal
3. Materials and Methods/Methodology-also in proposal
4. Results
5. Discussion

Referencing

The Abstract

At UoEm -**Data collection and Data analysis** has been most challenging

# **APPENDIX 3**

**Dr Romano Mwirichia**  
**Director, Research and Extension**  
**University of Embu**  
**April 2018**

# Research Proposal preparation

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**Dr. Romano Mwirichia**  
**Department of Biological Sciences**  
**University of Embu**

THURSDAY 26<sup>TH</sup> APRIL 2018

# What is a Research proposal?

“An original contribution to knowledge”

The project proposal should:

- Have a defined clear research question and approaches to finding an answer.
- Show originality and/or significance.
- Explain how it adds to, develops (or challenges) existing knowledge in the field.
- Persuade the reader on the importance of the work.
- Convince the reader why you are the right person to do it

# Why do we write?

- A good, well thought-out proposal forms a backbone for the Thesis.
- A good proposal stems from a good idea.
- A good idea hinges on familiarity with the topic.
- The proposal will also help you estimate the size and duration size of the project.
- Read everything you can in your area of interest.
- Synthesize the ideas.

**NEEDS TIME AND COMMITMENT**

# Proposal Outline

## Topic

- General and interesting enough to attract attention
- Precise but Informative enough to indicate the problem

## Introduction: Why is your research needed?

- Introduce the topic by telling the reader what your proposal about – **Scientific Background**
- Get specific about what your research will address – **Research Gap**
- How does it link existing knowledge in the area – **Background to the Research Gap**
- How will you address the Research Gap? – **Aim of the project**
- What is your Hypothesis?
- What methods will you use?
- What are the expected results and Relevance?

# Introduction recap

**At the end the reader should be aware:**

- What are you going to do?
- What specific issue or question will your work address?
- Why is that issue important
- Of the hypothesis to be tested
- What is your approach to the work?
- What new knowledge will the work generate?

**Aim**

**= target of your research**



# Objectives

= **steps** taken to achieve  
research aim



Objective 1

Objective 2

Objective 3

Objective 4





**Specific** precise

**Measurable** achievement

**Achievable** within project's duration

**Relevant** with regard to research aim

**Time-bound** set time-frame

# Literature Review

- State of our knowledge in the context of the proposed work
- Proves you have found, read, synthesized and Evaluated relevant existing literature.
- Sets the stage for your work; highlighting what has been done so far in the area.
  - ★ Let the information flow from more general to more focused studies relating to the topic.
- What are the GAPS in knowledge that need to be plugged?
- How does your work fit in? What will be the significance?
- What you have done so far?
- Are there preliminary studies to establish the feasibility of your research?

# METHODOLOGY

- Also referred to as : statement of work, Method and Procedures, Material and Methods, experimental design, methodology etc
- spell out the methods/steps by which you propose to achieve the objectives/desired results.
- Helps define the budgetary needs of the project.

## **Overview of approach**

- How do you intend to approach the research question?
- What techniques and logic will you use to address it?

# Methodology Cont....

## Data Collection

- Do you require any Government permits or Ethical clearance for your work?
  - What is your Field site? How will you get there?
  - What type of data do you anticipate to collect?  
**METADATA while in the field are very critical.**
  - What instruments/Field equipment will you need? Are they available?
  - Are there any problems/challenges anticipated in the field? How do you plan to Address/overcome them?

# Methodology cont...

## Biological samples

- Number and type of samples, method of collection.
- How will the samples be processed, transported, stored, and analyzed?
- Standardized procedures and protocols must be stipulated (quote relevant references).

Proper planning helps you detect flaws in the plan **before** they become problems in the research.

# Data Analysis

- How will the data be analysed/manipulated to get at the information needed to answer the research question?
- What statistical tools will be used? Are they suited to the type of data you will collect?

## Expected Results

- What are the expected outcomes? What will be the meaning of each outcome? Does it collapse your research or strengthen the findings?
- Give a summarized significance of the work.

# Work plan

- Should be in line with the methodology section.
- Best presented as chart listing activities & periods for undertaking them.
- Should also include where each activity will take place.

# Budget

- Should provide for sufficient resources for the project.
- Should present a clear relationship between the budget items and the research activities.
- It should be credible and realistic

A poorly presented budget probably reflects a poorly developed research project

**THE END**

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Thanks for your attention

# **APPENDIX 4**

**Dr Julius Mugweru**  
**Lecturer Department of Biological Sciences**  
**University of Embu**  
**April 2018**

# Tips on observing Academic rigor in your studies



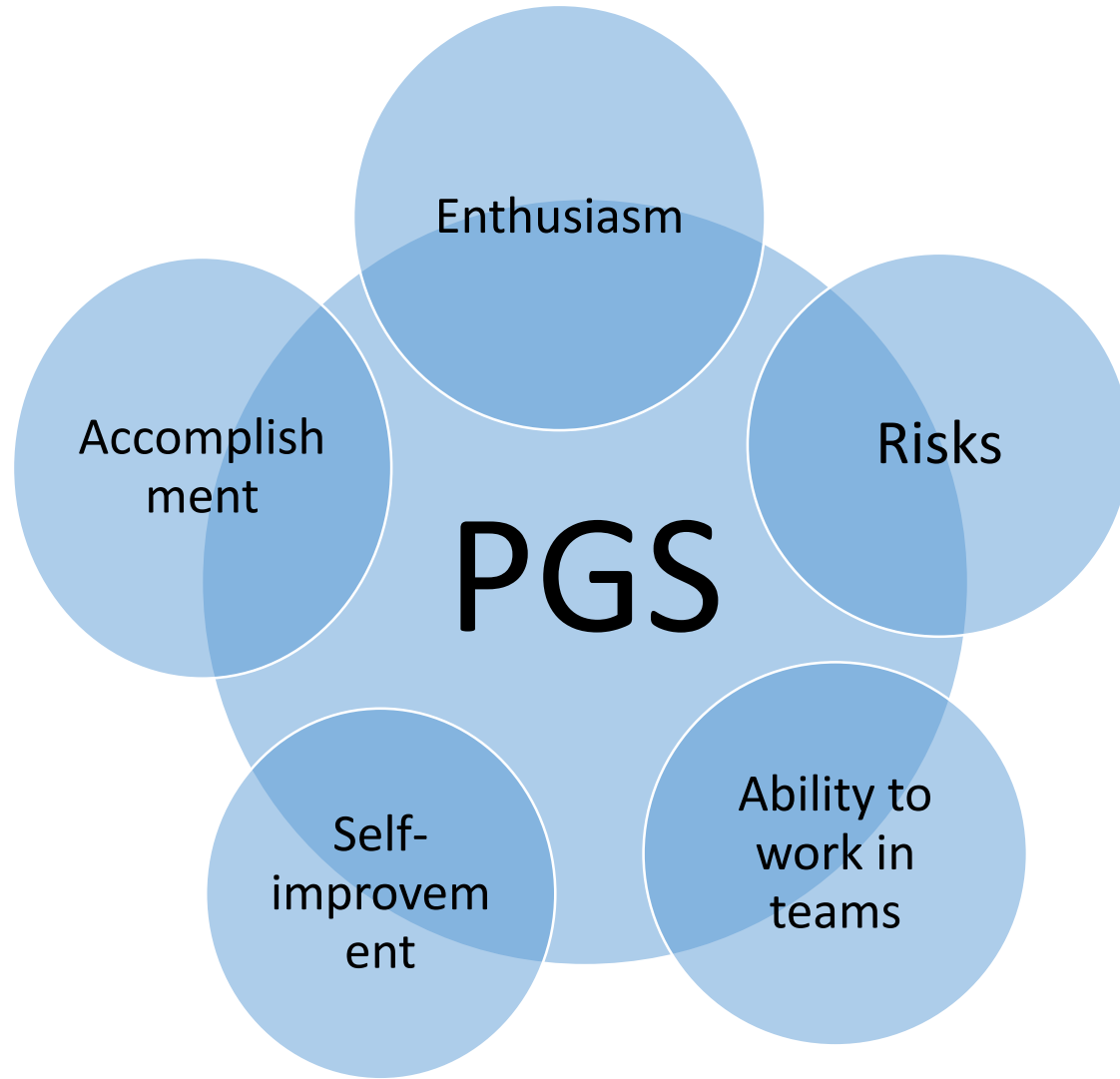
Julius Mugweru (PhD)

Lecturer Department of Biological Sciences

2018 4 26

# Outline

1. The situation being a post-graduate student(PGS).
2. Mental health.
3. Advisory/supervisory relationship.
4. Work-life balance.
5. Rejection and competition.
6. Conferences and presentations.
7. Software, organization and statistics.
8. Digital Networking.



Enthusiasm

Risks

PGS

Ability to  
work in  
teams

Self-  
improvement

Accomplishment

# Challenging and messy



But in the end you're proud of yourself for pushing through

# Why join the Graduate studies?

## 1. Gather knowledge

nerds



geeks



## 2. Get great ideas



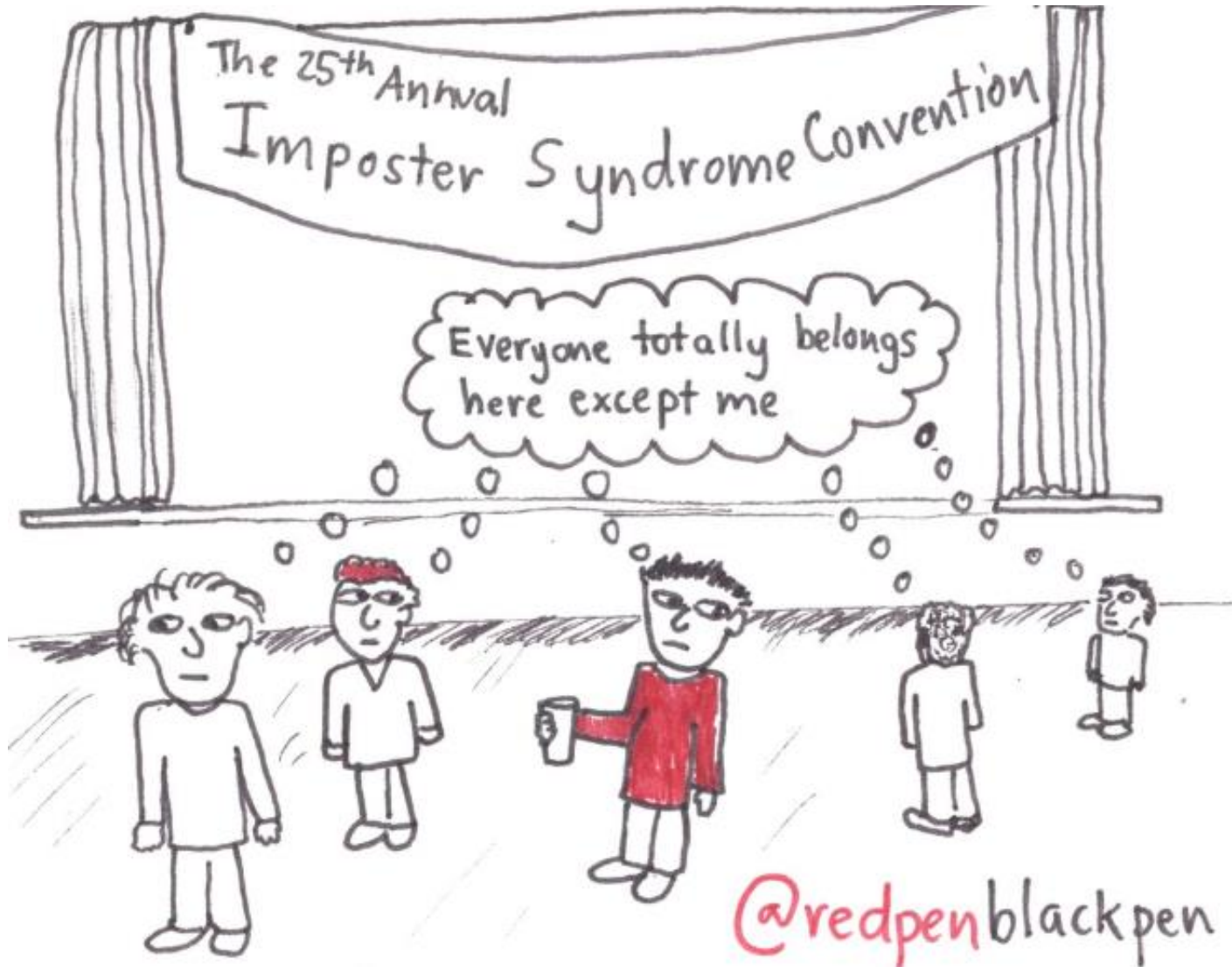
3. Learn experimental designs/  
creativity/logic



4.



# 1. The phenomena of the PGS.

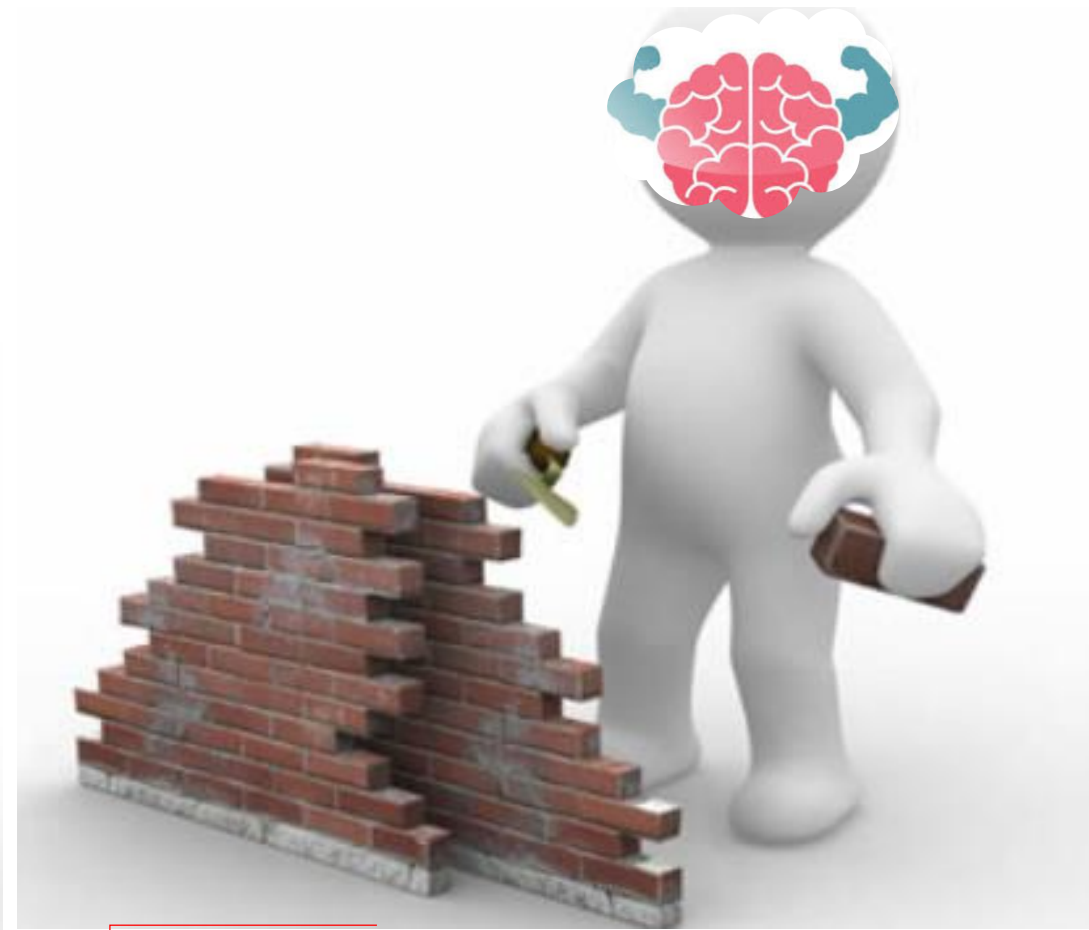
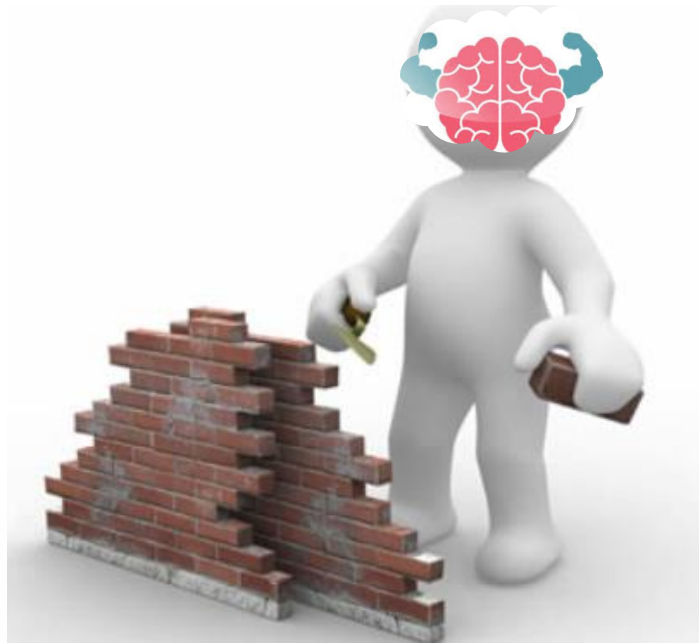
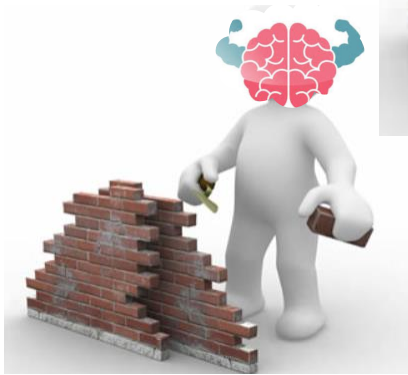


- Feelings of inadequacy!
- Chronic self doubt!





Building up knowledge



It takes time: be patient with yourself



**EGO**  
IS THE  
**ENEMY**

**HUMILITY**

**謙遜**

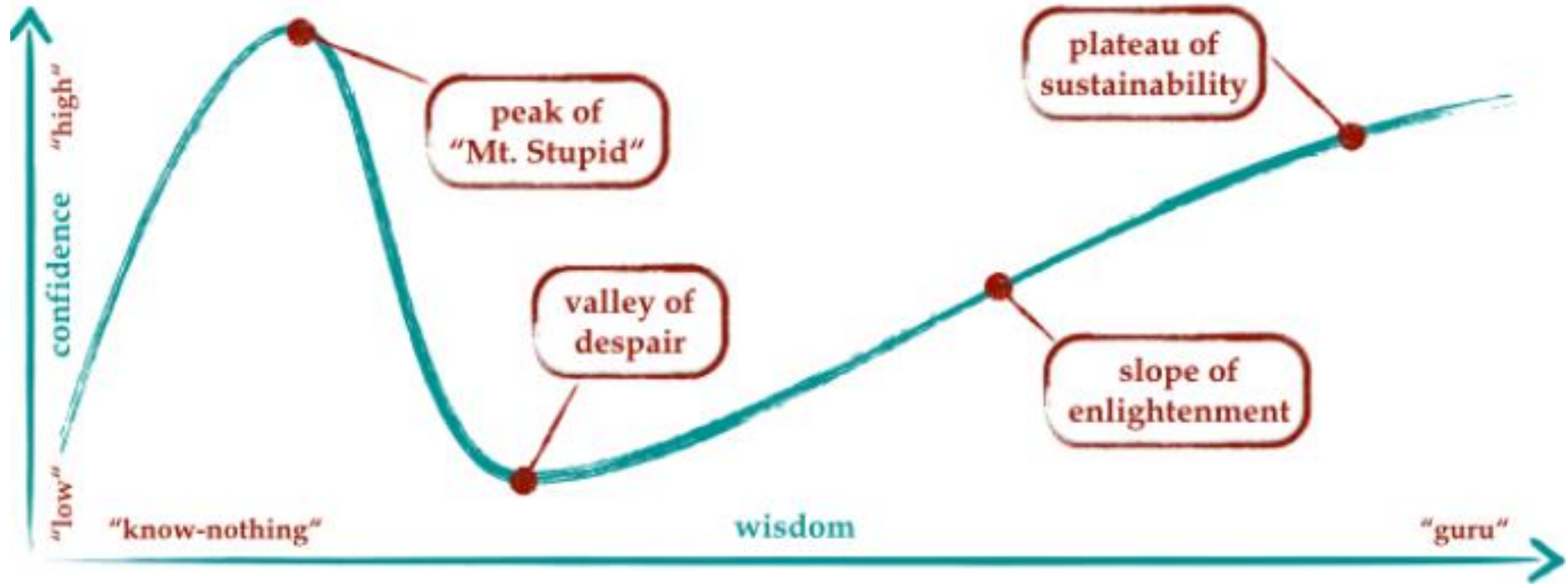
"BE LIKE THE BAMBOO  
THE HIGHER YOU GROW  
THE DEEPER YOU BOW"

CHINESE PROVERB

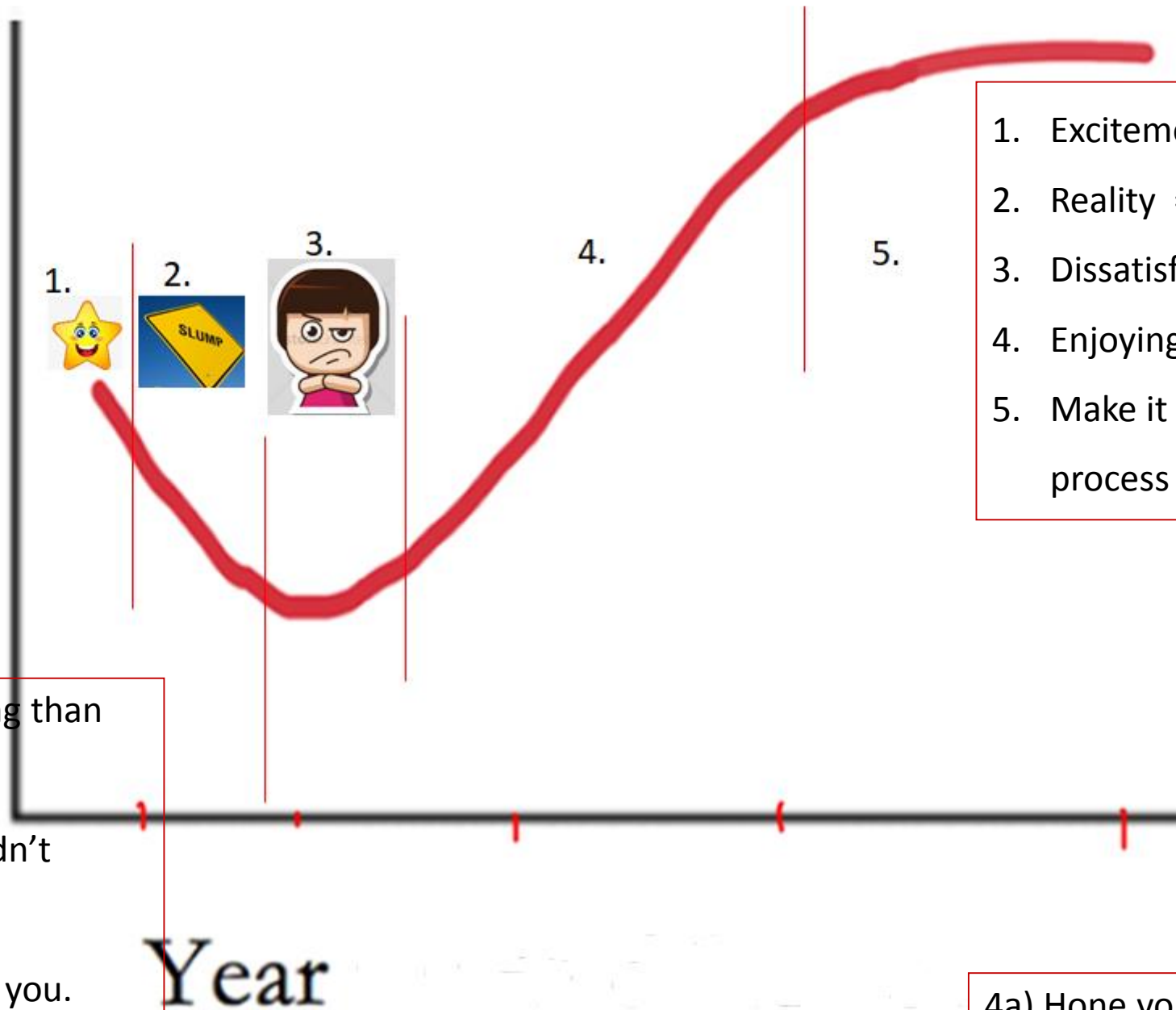


Learning Knows No Bounds

## Dunning-Kruger effect



# Enjoyment



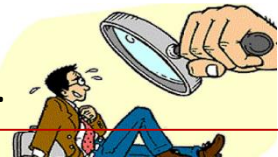
1. Excitement/Expectations
2. Reality =Slump
3. Dissatisfied
4. Enjoying your life
5. Make it through the publication process

2a). Its harder/less challenging than you expected

2b). 1<sup>st</sup> expt/ concept/idea didn't work.

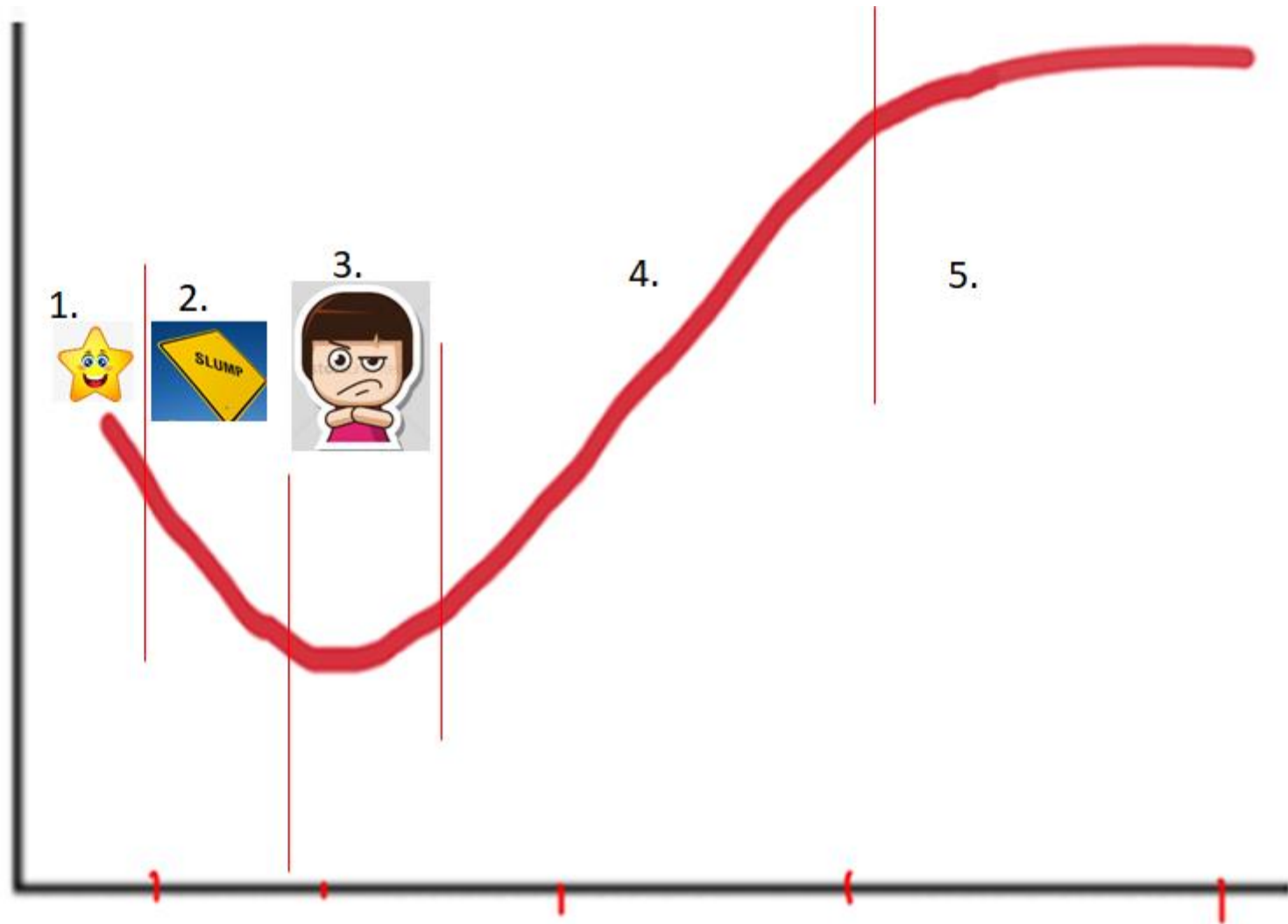
2c). Your peers seem ahead of you.

2d).



- 4a) Hone your skills
- 4b) Build your body of knowledge
- 4c) Explore new ideas

Enjoyment



Year



Four responsibilities

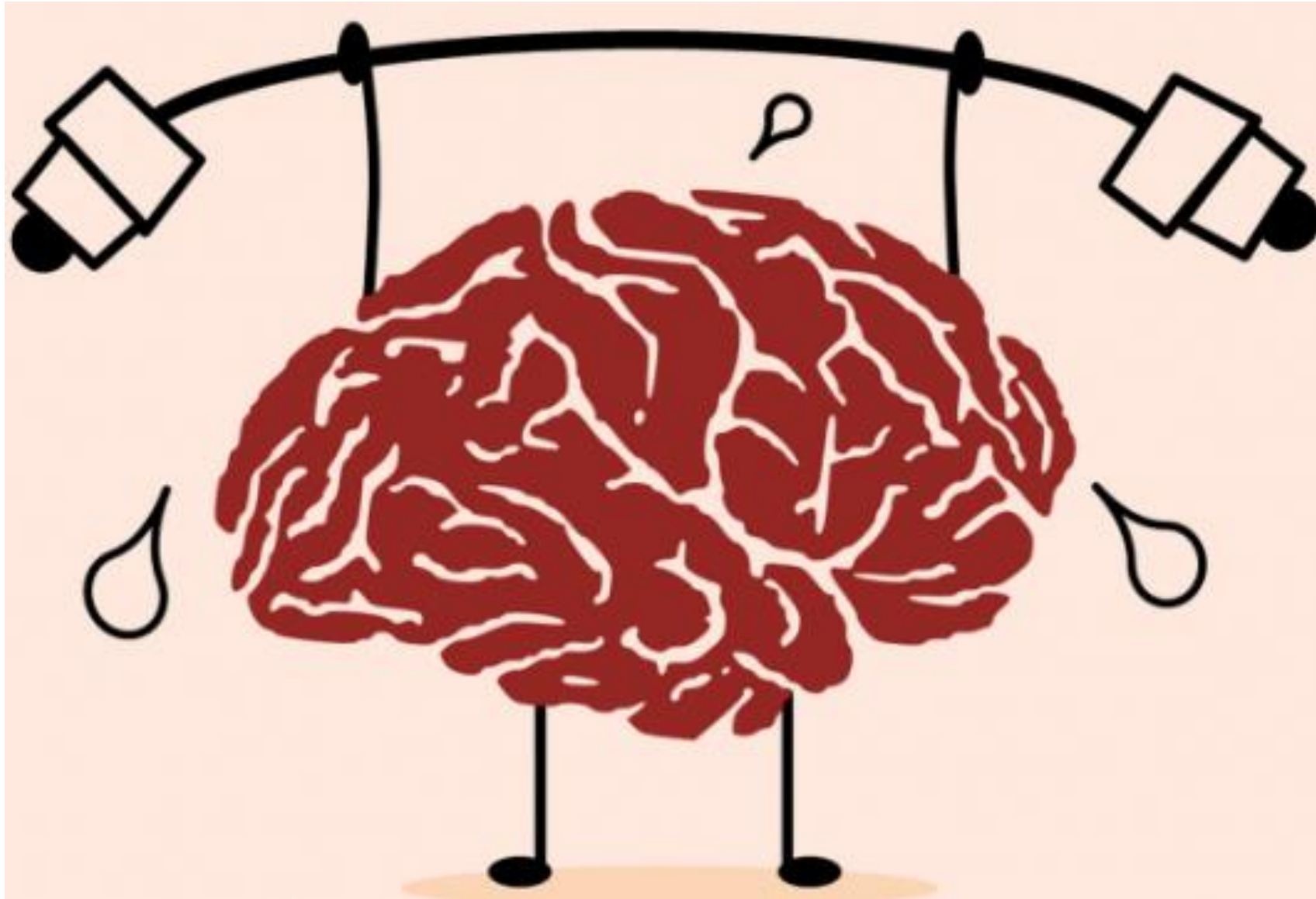
Sixty four responsibilities

Sixteen responsibilities

Two responsibilities

- Seems daunting, but remember you are levelling up

## 2. Mental Health



Seek help in  
difficult  
circumstances

Sleep  
adequately

### 3. Advisory relationship.



- a. Talk freely with you advisors about your career goals.
- b. Show up to your advisor with clear agenda.
- c. Start with the most sensitive agenda.
- d. Emails: ~~Don't write them more than 2 paragraphs email-~~ arrange a meeting instead.

Take everything you hear with a grain of salt.

Don't trust everything  
You see.  
Even salt looks like  
sugar.



## 4. Work-life Balance

Strain yourself only when there are BIG DEADLINES coming

A graphic where the word "Burnout" is written in a large, bold, black serif font. The letter "o" is replaced by a bright, fiery explosion with orange and yellow flames and white smoke, set against a background of a fire.

**Burnout**



Adequate Sleep



Spend time doing non academic things:  
Sports,....hobbies.....Movies, spending time with loved ones

## 5. Rejection and competition.

Manuscripts

Grants

Conference Posters

Academic jobs





KEEP  
CALM  
AND  
DON'T TAKE IT  
PERSONAL



OTHER PEOPLE'S

SUCCESS

IS NOT YOUR

FAILURE



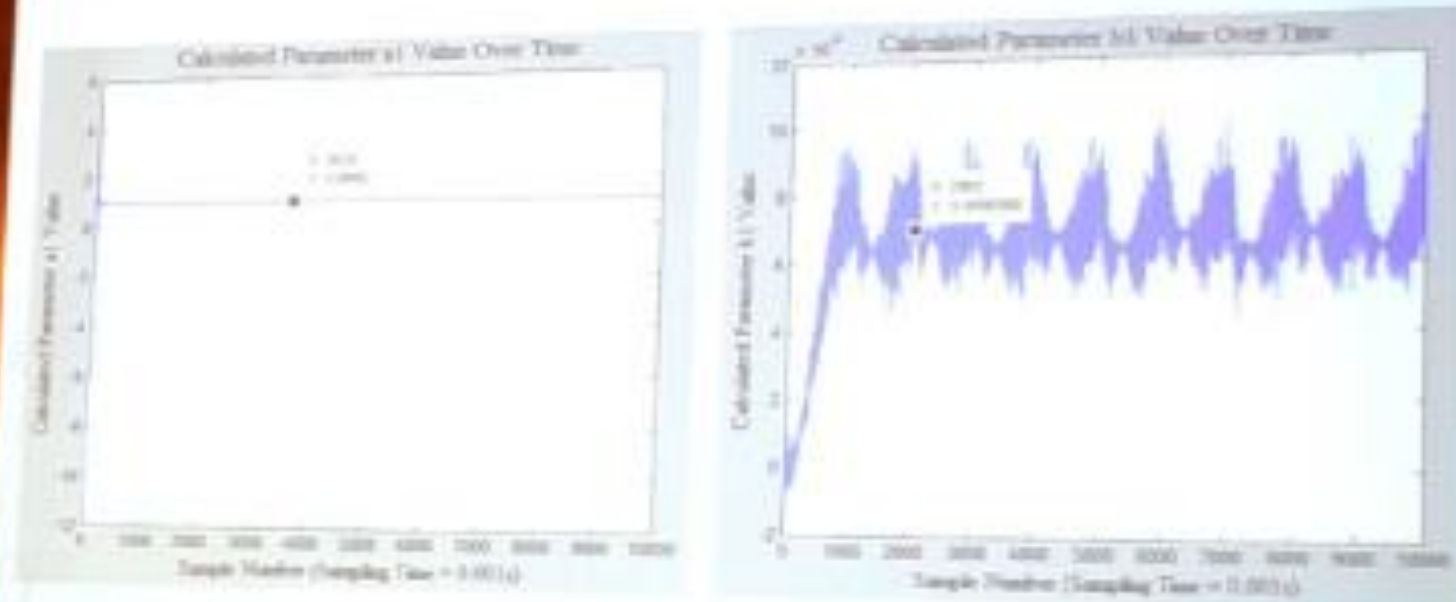
DON'T COMPETE



'Success in academics hinges upon long-term collaborative interactions'

## 6. Conferences, seminars, workshops.....

### Results



# Why attend academic talks?

- a. Only platform to meet great people.
- b. Start horizontally (.....).
- ~~c. Avoid the temptation to meet people for the sake of 'networking'.~~
- d. Meet people whose work you're familiar with.
- e. Talk to them like real people not as a **means to an end for your ambitions.**

# Which academic talks to attend?

- i. Attend talks relevant and irrelevant to your area of knowledge.
- ii. Begin by submitting abstracts for posters.
- iii. Remember: posters are **visual abstracts** (graphics; tables, pictures.....).
- iv. Your advisor can advise when to switch from presenting a poster to giving a talk.

# Giving a talk

- i. Remember 'every talk is a job talk'.
- ii. Rehearse your talk beforehand.
- iii. Don't memorize/read scripts.
- iv. Present as if you're having a conversation with the audience.

# Giving a talk.....

v. Clean slides (little text): **graphs, Tables, photos, Videos** 

vi. For each slide know the main points

vii. Don't excessively use transitions.

viii. Stage fright/presentation anxiety!!!

## 7. Software, organization, statistics

- i. Start learning Excel.
- ii. Familiarize/Practise OPEN SCIENCE.
- iii. Learn about Questionable Research Practices (QRPS).
- iv. Back up your files (**google drive, dropbox,.....**)

# Organization

v. Citation: ~~Don't manually cite anything~~ (Citation software's: mendley, Zotello Endnote.....).

vi. Keep your files organized.

vii. Each project to have its own folder.

viii. Manuscripts naming: (~~final draft.....manuscript1~~.....)

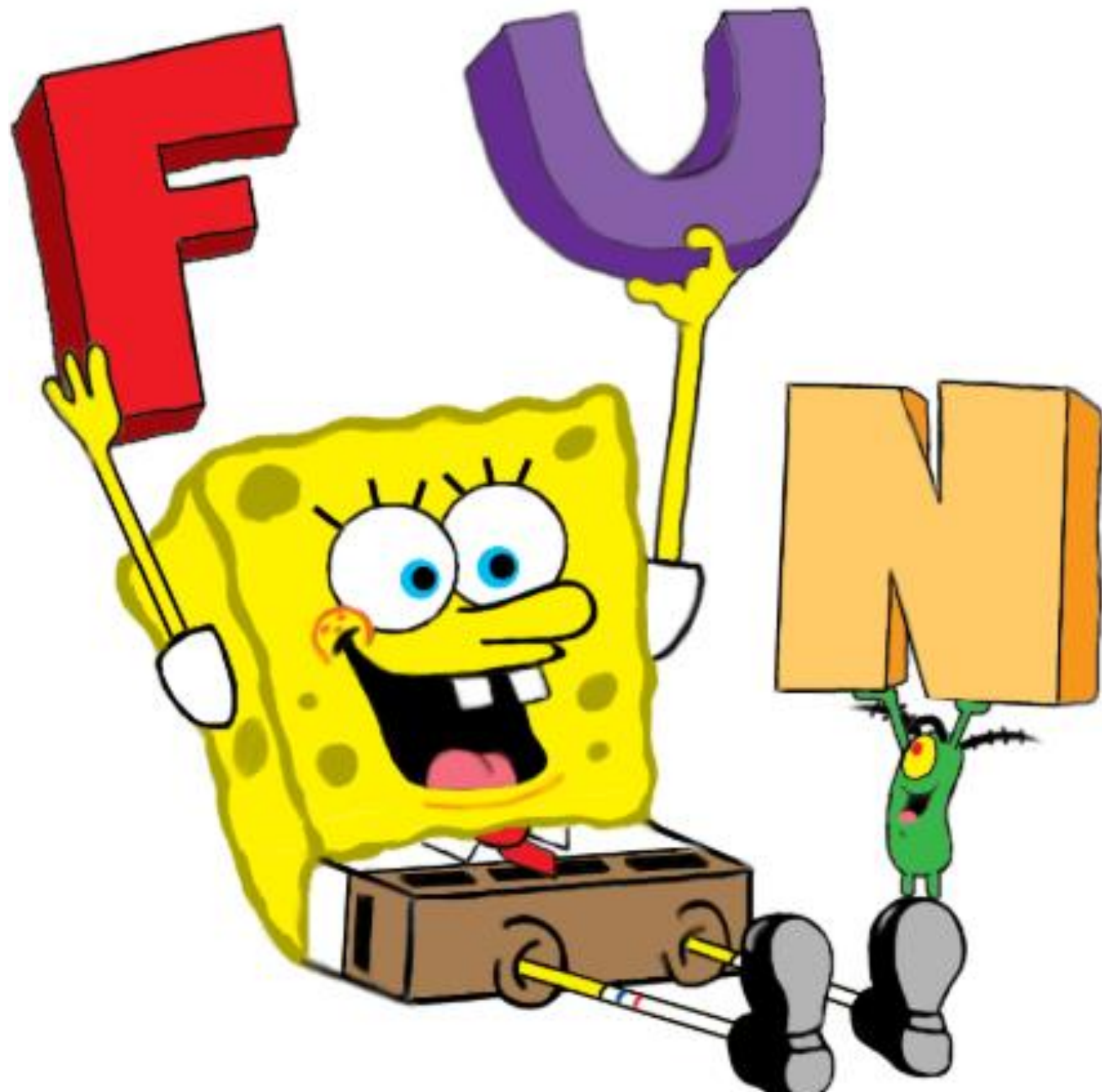
ix After editing a file, rename it with your name/initials and date.

## 8. Digital Networking



**#AcademicTwitter**





# References:

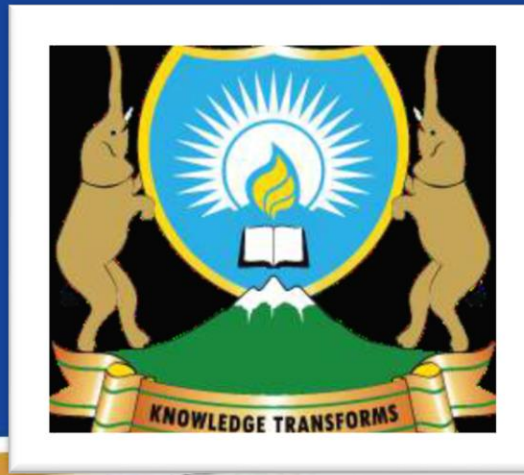
1. Personal experiences
2. [@DorsaAmir](#)
3. Nature.com

# **APPENDIX 5**

**Dr Robert Mathenge**

**University of Embu**

**April 2018**



*University of Embu*

*The Theoretical Framework*

*Dr Robert Mathenge-*

*(Ph.D statistics)*

# *Theory*

A theory is a set of interrelated ***constructs, definitions*** and ***propositions*** that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena.

***Constructs*** are concepts adapted for a scientific purpose.

Through research, scientists can develop, modify, or evaluate theories.

# Theory

- **Theories** are **generated** by using **inductive processes**
- A **deductive approach** is used to evaluate and modify existing theory by **testing predictions** about relationships between observed phenomena.

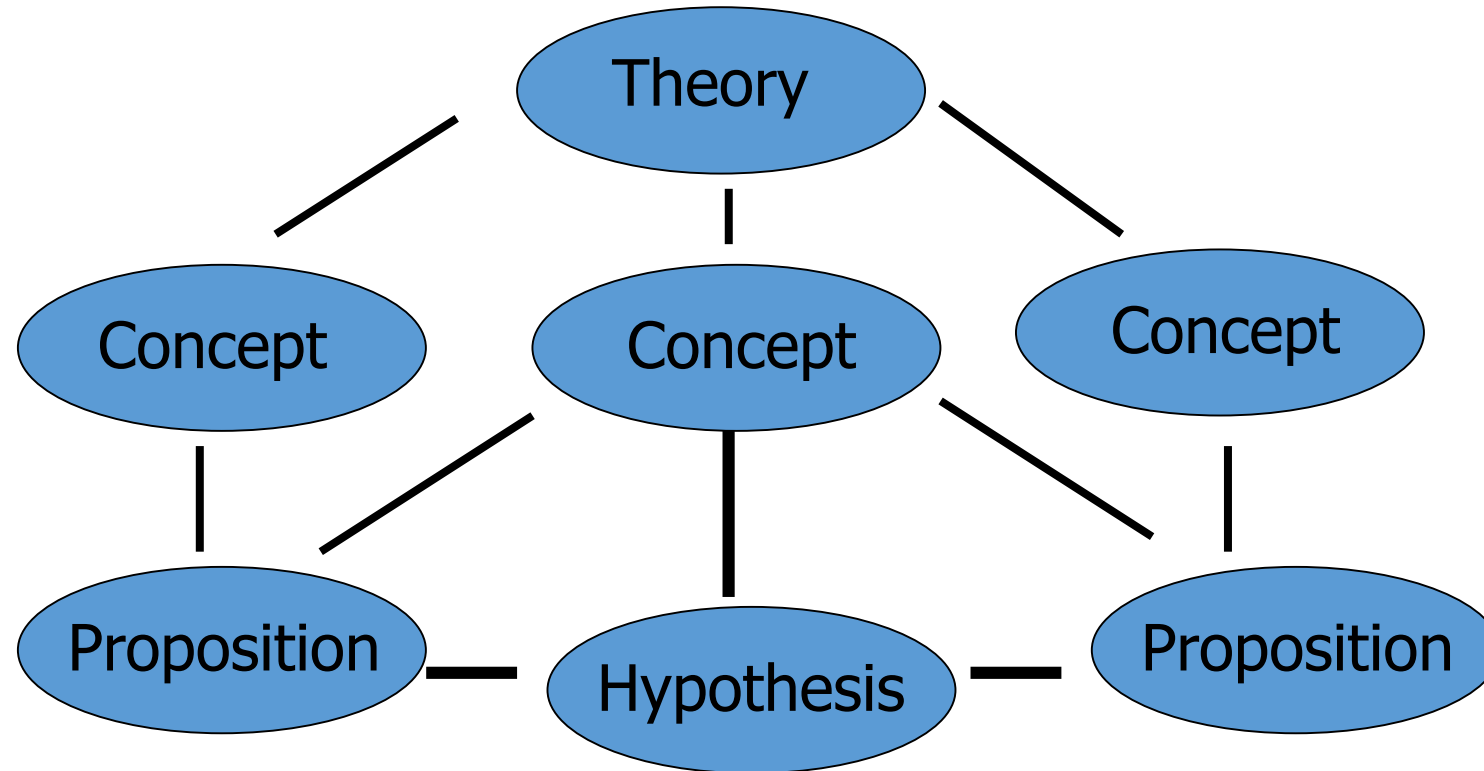
*A theoretical framework is similar to the frame of the house.*

Just as the foundation supports a house, a theoretical framework provides a rationale for predictions about the relationships among variables of a research study

## *Theoretical Framework*

- It provides a context for examining a problem i.e. theoretical *rationale for*:
  - ❖ Developing hypotheses
  - ❖ A frame of reference/base for
    - ✓ Observations
    - ✓ Definitions of concepts
    - ✓ Research designs
    - ✓ Interpretations
    - ✓ Generalizations
- Serves as a guide to systematically identify logical, precisely defined relationships among variables

# *Process of Hypothesis Generation*



**Hypotheses should express relationships between variables in an unambiguous, precise manner and they should be based on the propositions that evolved from the theoretical framework**

# *Testing the Hypotheses*

Testing the hypothesis involves:

- Selecting the individual subjects to participate in the study
- Using instruments that will validly and reliably measure the variables
- Developing a method of systematically collecting the information needed to test hypothesized relationships
- Selecting statistical measures that will determine the extent and meaning or significance of the relationships

## *The Use of a Theoretical Framework as a Guide in a Research Study*

- The outcomes of the study must be viewed in terms of their support or lack of support of the chosen **theoretical rationale**.
- The theoretical framework plays an important role in guiding the entire process of the research study.

## *The Use of a Theoretical Framework as a Guide in a Research Study*

- If the framework is logically sound and substantiated by previous research studies, there is a strong possibility that the predictions or hypotheses developing from that framework will be supported.
- *In some cases, a theoretical rationale is inappropriately used. e.g. a theory is designed to explain a particular behavior in infants may not be appropriate for the study of those behaviors in adults*

# *How to Develop a Theoretical Framework*

## 1. Select concepts

a *concept* is an image or symbolic representation of an abstract idea. e.g. health, pain, intelligence ...

## 2. Identify the interrelationships among concepts

A relationship may be:

a. rigid = scientific law e.g. laws of motion

*No known contradiction has been observed*

b. tentative or questionable = relationship that does not convey truth or falsity

*Laws and hypotheses are types of propositions*

# *How to Develop a Theoretical Framework*

3. **Formulating definitions:** to develop a theoretical framework that can generate and test hypotheses, concepts must be clearly defined

A. Conceptual definition ... conveys the general meaning of the concept

B. Operational definition ... adds another dimension to the conceptual definition by delineating the procedures or operations required to measure the concept

*Some concepts are easily defined in operational terms, e.g. pulse, other concepts are more difficult to define operationally, e.g. coping*

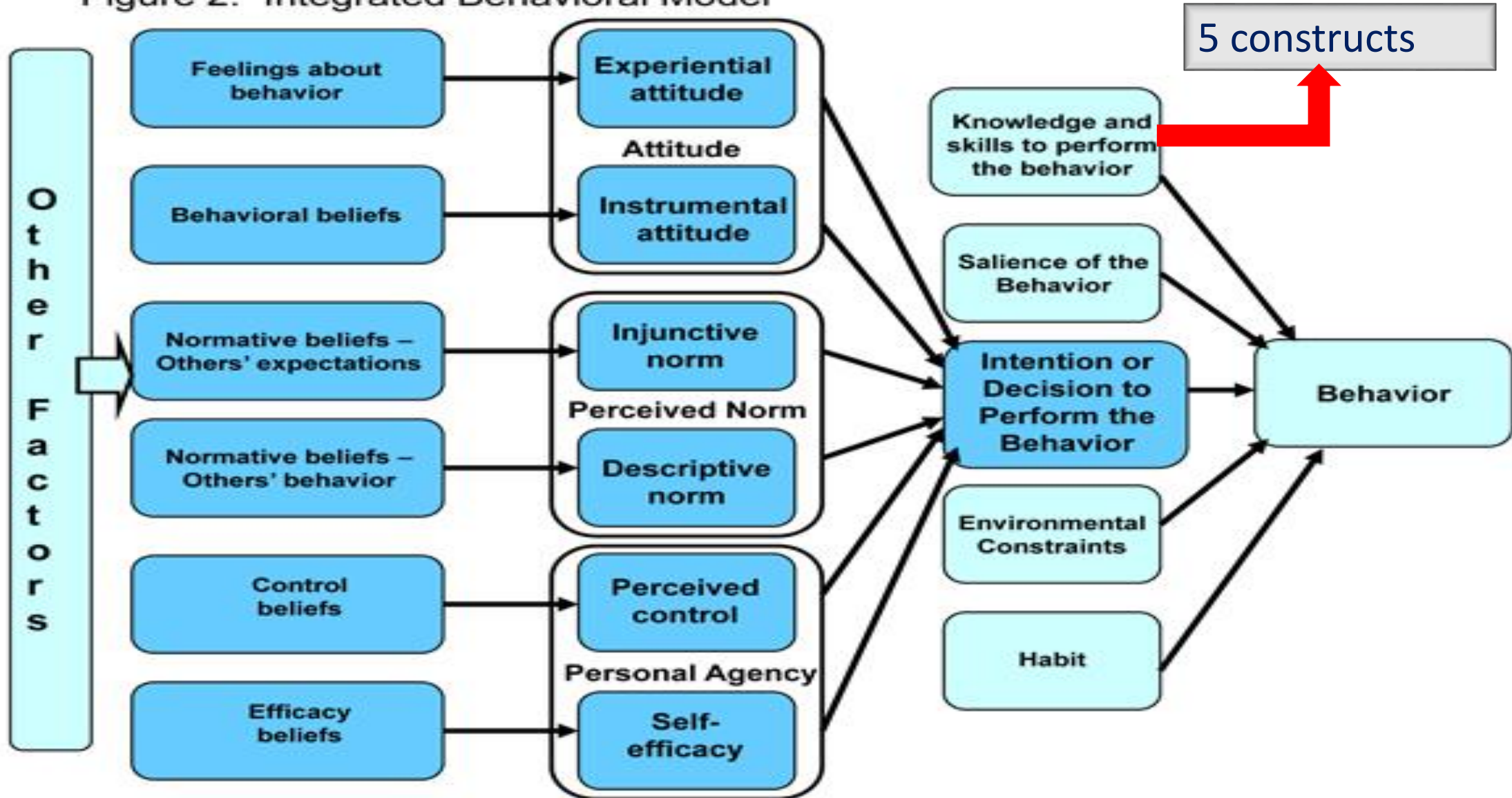
## 4. Formulating the theoretical rationale

- Through the literature review, an investigator becomes aware of or confirms identified theoretical connections between variables
- In evaluating the formulation of the theoretical rationale, the internal structures, such as concepts and their definitions, should have clarity and continuity, and the approach to understanding phenomena, whether inductive or deductive, should be logical

## Example:

There are five components that directly affect behavior:

Figure 2. Integrated Behavioral Model



## *Types of Theories & Types of Research*

- *Theories* may *describe* a particular phenomenon, *explain* relationships between or among phenomena, or *predict* how one phenomenon affects another
- *Descriptive theories* “describe or classify specific dimensions or characteristics of individuals, groups, situations, or events by summarizing the commonalities found in discrete observations
- *To test descriptive theories, researchers conduct descriptive research studies*

# *Types of Theories & Types of Research*

## *Explanatory theories*

specify relationships among the dimensions or characteristics of individuals, groups, situations, or events

➤ *Explanatory theories are tested by using **correlational research***

*Predictive theories* are intended to predict  
“precise relationships between the dimensions or  
characteristics of a phenomenon or differences  
between groups”

➤ *Predictive theories are tested through Experimental or  
quasi-experimental research designs*

# *Critiquing the theoretical framework*

1. Is the theoretical framework clearly identified?
2. Is the theoretical framework consistent with what is being studied?
3. Are the concepts clearly and operationally defined? Do they reflect the area of investigation?
4. Was sufficient literature reviewed to support the proposed relationships?
5. Is the theoretical basis for hypothesis formulation clearly articulated? Is it logical?

## *Critiquing the theoretical framework*

6. Are the relationships among propositions clearly defined?
7. If the theory is borrowed from a discipline other than “your discipline”, are the data related specifically to “your discipline”?
8. Does the instrument used to measure the variables, consistent with the theoretical framework?
9. Are the study findings related to the theoretical rationale?

# *Conceptual Framework*

## Definition:

- A conceptual framework represents the researcher's synthesis of literature on how to explain a phenomenon.
- It maps out the actions required in the course of the study given his previous knowledge of other researchers' point of view and his observations on the subject of research.

## Miles and Huberman (1994)

“A conceptual framework explains, either graphically or in narrative form [both are much preferred], the main things to be studied – the key factors, constructs or variables – and the presumed relationships among them”.

❖ Using a diagram of the topic is literally worth more than 10,000 words.

### **Step by Step Guide on How to Make the Conceptual Framework**

- Choose your topic.
- Do a literature review.
- Isolate the important variables.
- Generate the conceptual framework.

## Independent Variables

**Entry Barriers**  
-Strict Entry Regulations  
-Entry Fees  
-Expensive to Acquire entry Vehicles

**Human capital/ Competencies**  
-Education  
-Managerial Experience  
-Industry Experience  
-Business Training

**Operational Barriers**  
-Mungiki operations  
-Police harassment  
-Unfaithful crews  
-Highway thieves

**Entrepreneurial traits**  
-Risk taking  
-Tolerance  
-Creativity  
-Responsiveness to Criticisms  
-Self confident  
-Getting Along with Others  
-Knowledge of Markets

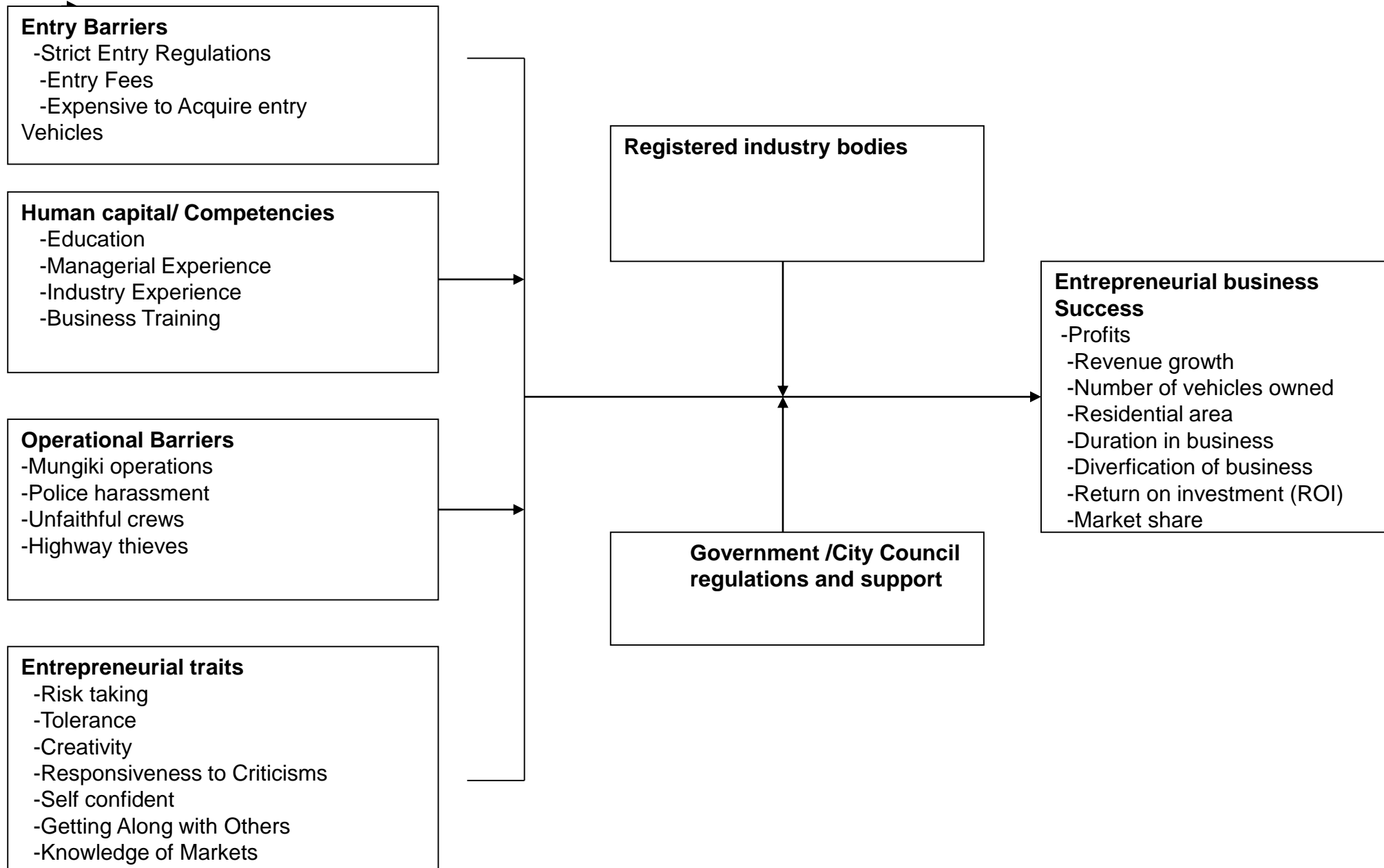
## Moderating Variables

**Registered industry bodies**

**Government /City Council regulations and support**

## Dependent Variable

**Entrepreneurial business Success**  
-Profits  
-Revenue growth  
-Number of vehicles owned  
-Residential area  
-Duration in business  
-Diverfication of business  
-Return on investment (ROI)  
-Market share



## Operationalization of variables

- Imprecise variables which cannot be measured are broken down into observable behavior or characteristics.

Example:

- The concept of thirst is abstract which we cannot measure. If a person is thirsty, then we can determine his level of thirst through the amount of fluid he drinks to quench his thirst.
- Reduction of abstract concepts to render them measurable in a tangible way is **operationalizing the concepts.**
- Operationalizing is done by looking at behavioral dimensions, facets or properties denoted by concept. These are then developed into measurable and observable element so as to develop index of measurement.

## Steps of operationalizing a concept:

- Definition of construct to measure
- Content of measure: Instrument which actually measures the concept one wants.
- Response format: 5 points likert scale, 7 point likert based on “strongly disagree” to “strongly agree”
- Assessing the validity and reliability of measurement scale.

## Operationalization: dimensions and elements

- Example of thirst and need for cognition shows that abstract constructs are operationalized by observable and measurable elements.
  - In some cases, only one item is needed for measurement such as thirst.
  - un-dimensional constructs such as recognition requires at least 34 items, one less item will cause invalidity of measurement.
  - If a construct has more than one dimension, we have to make sure that questions or items that adequately represent these dimensions are included in our measure.

**Table 3.7 Operationalization of Research variables**

| Dependent variable                          |                                                                                                                                                                   |                                  |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Variable                                    | Operationalization of Research variables                                                                                                                          | Measure                          |
| <b>Business Success</b>                     | Profits, Revenue growth, Number of vehicles owned, Residential area, Duration in business, Diversification of business, Return on investment (ROI), Market share. | <b>Quantitative measurements</b> |
| Independent variables                       |                                                                                                                                                                   |                                  |
| <b>Entry Exit Barriers</b>                  | Entry Regulations, Entry Fees, Easy Acquisitions of entry Vehicles,                                                                                               | <b>5-point likert scale</b>      |
| <b>Human capital / Competencies</b>         | Education, Managerial Experience, Industry Experience, Business Training.                                                                                         | <b>5-point likert scale</b>      |
| <b>Personal Traits</b>                      | Risk taking, Tolerance, Creative, Responsive to Criticism, Self confident, Getting Along with Others, Knowledge of Markets.                                       | <b>5-point likert scale</b>      |
| <b>Operational Barriers</b>                 | Mungiki operations, Police harassment, Unfaithful crews, Highway thieves                                                                                          | <b>5-point likert scale</b>      |
| Moderating variables                        |                                                                                                                                                                   |                                  |
| <b>Government policies and regulations.</b> | Law and Order, Good Working Environments, Security Measures and Helping People Start their own small Businesses.                                                  | <b>5-point likert scale</b>      |
| <b>Registered</b>                           | <b>Fair Route Allocations, Law and Order, Fair Business Practice and</b>                                                                                          | <b>5-point likert scale</b>      |

# References

- i. Miles, M. B. & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks: Sage.
- ii. Hart C. (1998): *Doing a Literature Review.* London, Sage.
- iii. Jennings G. (2001): *Tourism Research.* Australia, John Wiley and Sons.
- iv. Maslow A (1954): "Motivation and Personality." New York: Harper.
- v. Miles, M. B., & Huberman, M. A. (1994): "Qualitative Data Analysis: An Expanded Sourcebook" (2<sup>nd</sup> edition). Beverley Hills, Sage.
- vi. Rogers, E.M. (2003): "Diffusion of Innovations." 5<sup>th</sup> Edition. London, Simon and Schuster.
- vii. Smyth R. (2004): "Exploring the Usefulness of a Conceptual Framework as a Research Tool: A Researcher's Reflections." *Issues In Educational Research*, Volume 14.
- viii. Yin R. K. (1994): "Case Study Research: Design and Methods." (2<sup>nd</sup> edition) California, Sage.

*Thank You*

*Dr Robert Mathenge Mutwiri(Ph.D)*

# **APPENDIX 7**

**Prof Nancy Budambula**

**Director, BPS**

**University of Embu**

**April 2018**

**2<sup>nd</sup> Proposal and Thesis Workshop**  
**University of Embu**  
**26<sup>th</sup> April 2018**

**The Results Chapter**

Prof Nancy Budambula  
Director, BPS

# The Results: An Examiners Perspective

What the Results Chapter is not

From an examiners perspective **it is not:**

- Photo album
- Collection of figures or tables
- Collection of bar graphs and percentages
- Hurried addendum to proposal
- Repeat of methodology

# What is a results chapter?

- Backbone of the thesis.
- Carries the findings of the study.
- Frequently the longest chapter in the thesis.
- Carries most marks where thesis and project reports are ranked.

Most challenging to write.

- From methods data is generated:
  - ✓ Data must be analysed.
  - ✓ Findings of study must be communicated to the reader in the Results Chapter.

# What is a results chapter? Cont...

- Generates the publication.
- Often is the basis on which a thesis is judged.
  - ✓ Did it generate new knowledge?
  - ✓ Did it interpret existing knowledge in a new way?
- Provides data for each objective
  - Arrange data objective by objective

# Important aspects of a Results Chapter- pay attention

- ✓ Research design, appropriate tools of analysis.
- ✓ Is the data from an appropriate sample size?
- ✓ Statistically sound?
- ✓ If not statistical data-
  - What is appropriate tool of analysis?
  - What is the “gold standard” in the discipline?
  - Software and inbuilt statistical tools
- ✓ Can the data be replicated?
- ✓ Data on Control group/experiments

# Clarity and detail in reporting results

- State the result, then support with an illustration- table, plate, figure.
- **Illustrations**
  - ✓ must be introduced before they appear.
  - ✓ must be of good quality.
  - ✓ must be able to stand alone- legend/title must be descriptive should have information on what, where, when.
- should appear immediately they are mentioned on the same page or next page, not much later.
- Quantify results- avoid very high, most, few.
- Word significant – be accompanied by a statistic, at what P value?

## Clarity and detail in reporting results Cont..

- Report results objective by objective.
- Subtopics in results to reflect objectives,
- Avoid too many repetitive illustrations that can be synthesized into one.
- In some cases graphs can be drawn on the same axis. Tables can be combined.
- Some large tables on several pages can be split or moved to appendices. – Use your common sense.
- Avoid statements like.. this is a graph.

# Invest in preparing the Results Chapter

- Do not write a hurried addendum to the research proposal.
- Refer to journals which have published similar work and examine the methods used in analysis and style of reporting results.
- Postgraduate- go beyond bar charts and percentages.
- Deliberate effort to find tools that have been used to synthesize the data in other studies.
- Invest time and money in learning how to analyse the data, use software and attend training if necessary. **Short courses available.**

# **APPENDIX 8**

**Prof Nancy Budambula  
Director, BPS  
University of Embu  
April 2018**

**2<sup>nd</sup> Proposal and Thesis Workshop**  
**University of Embu**  
**26<sup>th</sup> April 2018**

**Discussion Chapter**  
**Prof Nancy Budambula**  
**Director, BPS**

# Observations about Discussion

## From an examiners Diary-

- Most students do not write a discussion chapter,
  - present something that is not a discussion.
  - repeat the results or methods.
  - provide a list of similar studies/repeat literature review.
  - provide a list of authors who did previous work.
  - Write it hurriedly.
- General observation <30% percent write it correctly.

# Importance of Discussion Chapter

- 2<sup>nd</sup> most important chapter after results.
- Often carries the second highest proportion of marks.
- Interprets the results without repeating the results chapter.
- Provides opportunity to show mastery of subject.
- Provides opportunity to demonstrate or explain contribution to knowledge.
- How long should it be?

# Conclusions

- Discussion is incomplete without conclusions.
- Based on the data obtained, draw a conclusion for each objective.
- For Compound objectives two or three conclusions can be drawn

Based on your conclusions, do you accept or reject the hypotheses?

# Recommendations

- Based on your conclusions make recommendations.
- Recommendations need to be directed eg to policy maker, researchers etc

# Avoid these kind of sentences

- Budambula (2009) said
- Maina (2012) also said
- Another researcher Otieno in (2011) said
- Researchers in India Patel and Shah (1980) Patel
- According to Koech and Wafula (2015)
- Postgraduate students demonstrate ability to write correct English statements.

## Remember

- ❑ Referencing must be done well and will be checked. **Do not blame software**
- ❑ Appendices are part of the thesis and must be well done with appropriate titles.

# THEMATIC THESIS

GENERAL INTRODUCTION

THEMATIC CHAPTERS

Each chapter with its Literature Review, Materials and Methods, Results, Discussion

SYNTHESIS/ OR GENERAL DISCUSSION

REFERENCES

The presentations/discussions apply to respective section

# **APPENDIX 9**

**Prof Nancy Budambula**

**Director, BPS**

**University of Embu**

**April 2018**

**2<sup>nd</sup> Proposal and Thesis Workshop**  
**University of Embu**  
**26<sup>th</sup> April 2018**

**Thesis/Report writing and Examination**

**Prof Nancy Budambula**

**Director, BPS**

# Thesis or Project Report Writing

- Deliberate, systematic, planned, continuous.
- Start writing when you start collecting data. Write every day, synthesize every week. You are already writing the Methods.
- To be a good writer you must be a good reader.
- Pay attention to style, grammar, punctuation and details.
- Learn from others, read peer reviewed journals.
- As you write, read and compare with what has been published in the area.
- Create time and space for writing.

# Time and space to write

- Time to sacrifice.
  - Retreat from daily routine.
  - Continuity and targets
- My approach to reading my students work, chapter by chapter in this order Results, Discussion, Methodology, Introduction and Literature. – then full draft.
- Masters should take 6 weeks to 2 months to write, PhD 2 to 3 months to write thesis.

**Well started Objectives and Statement of the problem key to a good thesis**

# Examination of Thesis/Project Report

- The Thesis/Project Report is an examination. You must prepare well.
- If you are lazy, **Remember** – Examiners are not lazy
- The examination is in the details including punctuation, labels, references.
- Avoid annoying the examiners.

## **Thesis Defense/ *viva voce* with living voice**

- ✓ Final examination for thesis. Not time to be passive.
- ✓ You must prepare well.
- ✓ Be alert and articulate.
- ✓ Focus on Results and their interpretation/discussion
- ✓ At defense one must demonstrate mastery of subject and new contribution(s) to science/knowledge.

# Possible defense outcomes

1. Award without corrections. <1%
2. Award subject to minor corrections-resubmit 3 months/4months for MSc/PhD.-no new examination required.
3. Award subject to major corrections-resubmit 6months/8months for MSc/PhD. -no new examination required. **Slippery ground**
4. Revise and resubmit for examination 6/8-12 months\***dangerous place to be**(only one resubmission is allowed).
5. Do not award.

Aim to finish in category 1 or 2.

# **APPENDIX 10**

**PROF KIPLAGAT KOTUT**

**DVC ARE**

**UNIVERSITY OF EMBU**

**APRIL 2018**



# UNIVERSITY OF EMBU

## PROPOSAL AND THESIS WRITING WORKSHOP APRIL 25, 2018

P.O. BOX 6-60100, EMBU, KENYA

EMAIL: [dvc.are@embuni.ac.ke](mailto:dvc.are@embuni.ac.ke)

WEBSITE: [www.embuni.ac.ke](http://www.embuni.ac.ke)

*Knowledge Transforms*

The slide features a white background with several realistic water droplets of various sizes scattered in the corners. The droplets have highlights and shadows, giving them a three-dimensional appearance. The main text is centered in a bold, black, sans-serif font.

# **WRITING A WINNING ABSTRACT**



# WHAT IS AN ABSTRACT?

- A brief summary of a research article, thesis, review, conference proceeding etc. For a Thesis - a summary of the whole thesis.
- Presents all the major elements of one's work in a highly condensed form.
- Because it is presented at the beginning of the thesis, it is likely the first substantive description of your work read by any person interested in your work.
- This applies to an external examiner too and gives room for early judgement. It is often used to help the reader quickly ascertain the paper's purpose.



# **KEY PARTS OF AN ABSTRACT.**

# CHARACTERIZATION, ENZYMATIC ACTIVITY, AND SECONDARY METABOLITES OF FUNGAL ISOLATES FROM LAKE SONACHI IN KENYA

NDWIGAH F. IRERI, BOGA I.HAMADI, WANYOIKE WANJIRU AND ROMANO KACHIRU

The soda lakes of Kenya provide an extreme environment where diverse groups of microorganisms thrive. They are characterized by great variation in temperature, halophilic and alkaliphilic- extreme conditions. Lake Sonachi has been the study site for this research. The study sought to isolate, characterize and identify fungi, screen for potential exo-enzymes and secondary metabolites production that may be of industrial application. Malt extract agar was used in the isolation of fungi and six (6) isolates were recovered. Inhibition zones were used to measure the enzymatic and antimicrobial activity of the isolates. GC-MS analysis was done on the filtrates extracted from the fungi to identify secondary metabolites. Molecular characterization of the 18S rDNA was done using fungal primers and sequencing PCR products. A phylogenetic tree was inferred using neighbor-joining method. The fungal isolates were aligned to different genera, *Acremonium* sp., *Scopulariopsis* sp., *Verticillium* sp., *Fusarium* sp. and *Paecilomyces* sp. The fungal isolates produce different types of enzymes (cellulases, proteases, pectinases and lipases) and metabolites (acids, ketones, quinones, alcohols, esters etc). Antimicrobial assay showed that most of the fungal isolates produced inhibition zones ranging from 0.1 to 4mm, an indication of presence of compounds with antimicrobial activity against most of the test organisms, *E. coli*, *B. subtilis*, *S. aureus* etc., used in this study. Results indicate that Lake Sonachi, a soda lake has fungal species that are capable of producing enzymes and metabolites with antimicrobial activity.

**Keywords:** characterization, enzymatic activity, antimicrobial activity and, secondary metabolite.

# MAJOR ASPECTS OF AN ABSTRACT:

## 1. FROM THE INTRODUCTION

➤ The *question(s) you investigated* (or purpose).

*Recommendation:*

- State the purpose very clearly in the first or second sentence.

# CHARACTERIZATION, ENZYMATIC ACTIVITY, AND SECONDARY METABOLITES OF FUNGAL ISOLATES FROM LAKE SONACHI IN KENYA

NDWIGAH F. IRERI, BOGA I.HAMADI, WANYOIKE WANJIRU AND ROMANO KACHIRU

The soda lakes of Kenya provide an extreme environment where diverse groups of microorganisms thrive. They are characterized by great variation in temperature, halophilic and alkaliphilic- extreme conditions. Lake Sonachi has been the study site for this research. The study sought to isolate, characterize and identify fungi, screen for potential exo-enzymes and secondary metabolites production that may be of industrial application.

# MAJOR ASPECTS OF AN ABSTRACT (CONT):

## 2. FROM METHODS

➤ The *experimental design and methods* used

### *Recommendation:*

- Clearly express the basic design of the study.
- Name or briefly describe the basic methodology used without going into excessive detail - be sure to indicate the key techniques used

# CHARACTERIZATION, ENZYMATIC ACTIVITY, AND SECONDARY METABOLITES OF FUNGAL ISOLATES FROM LAKE SONACHI IN KENYA

NDWIGAH F. IRERI, BOGA I.HAMADI, WANYOIKE WANJIRU AND ROMANO KACHIRU

**Malt extract agar was used in the isolation of fungi and six (6) isolates were recovered. Inhibition zones were used to measure the enzymatic and antimicrobial activity of the isolates. GC-MS analysis was done on the filtrates extracted from the fungi to identify secondary metabolites. Molecular characterization of the 18s rDNA was done using fungal primers and sequencing PCR products. Phylogenetic tree was inferred using neighbour-joining method. The fungal isolates were aligned to different genera, *Acrimonies* sp., *Scopulariopsis* sp., *Verticilium* sp. *Fusarium* sp. and *Paecilomyces* sp.**

## MAJOR ASPECTS OF AN ABSTRACT (CONT):

### 3. FROM RESULTS

➤ **The major findings including key quantitative results, or trends.**

#### *Recommendation:*

- Report those results which answer the questions you were asking
- Identify trends, relative change or differences, etc.

# CHARACTERIZATION, ENZYMATIC ACTIVITY, AND SECONDARY METABOLITES OF FUNGAL ISOLATES FROM LAKE SONACHI IN KENYA

NDWIGAH F. IRERI, BOGA I.HAMADI, WANYOIKE WANJIRU AND ROMANO KACHIRU

The fungal isolates produce different types of enzymes (cellulases, proteases, pectinases and lipases) and metabolites (acids, ketones, quinones, alcohols, esters etc). Antimicrobial assay showed that most of the fungal isolates produced inhibition zones ranging from 0.1 to 4 mm, an indication of presence of compounds with antimicrobial activity against most of the test organisms, *E. Coli*, *B. Subtilis*, *S. Aureas* etc., used in this study.

# THE FOLLOWING ARE THE MAJOR ASPECTS OF AN ABSTRACT (CONT):

## 4. FROM DISCUSSION

- A brief summary of your **interpretations** and **conclusions**.

### *Recommendation:*

- Clearly state the implications of the answers your results gave you.

# CHARACTERIZATION, ENZYMATIC ACTIVITY, AND SECONDARY METABOLITES OF FUNGAL ISOLATES FROM LAKE SONACHI IN KENYA

NDWIGAH F. IRERI, BOGA I.HAMADI, WANYOIKE WANJIRU AND ROMANO KACHIRU

Results indicate that lake Sonachi, a soda lake has fungal species that are capable of producing enzymes and metabolites with antimicrobial activity.

Keywords: characterization, enzymatic activity, antimicrobial activity and secondary metabolite.

**\*KEYWORDS** - *Words or phrases that capture the most important aspects of a paper*



# WRITING AN ABSTRACT.

- Information in an abstract is usually presented in one paragraph.
- Compared to the title of one's work, which can only make the simplest statement about the content the work, an Abstract allows you to elaborate more on each major aspect of the paper.

## **STEPS TO FOLLOW WHEN WRITING YOUR FIRST ABSTRACT:**

- 1. Take whole sentences or key phrases from each section and put them in a sequence which summarizes the paper.**
- 2. Set about revising or adding words to make it all cohesive and clear.**

## STEPS TO FOLLOW WHEN WRITING YOUR FIRST ABSTRACT (CONT):

3. *Once you have the completed abstract, check to make sure that the information in the abstract completely agrees with what is written in the paper.*
4. *Confirm that **all** the information appearing the abstract actually appears in the body of the paper.*
5. *As you become more proficient you will most likely compose the abstract from scratch.*

## **DETERMINING THE ADEQUACY OF AN ABSTRACT:**

- Assume you are another researcher in the same field and that the abstract is is the only part of the paper available;
- Is the amount of information presented adequate?
- Does the abstract communicate the whole story about the study?
  - If the answer is “yes” then the abstract is okay
  - If the answer is "no" then the abstract needs to be revised.

## **SIZE OF AN ABSTRACT:**

- The length of an abstract may vary according to discipline or type of report
- An abstract should be kept to between 200 to 300 words maximum. This is a typical standard length for journal abstracts.
- Most journals prescribe the length of the same.

## **NOTE:**

1. Although it is the first section of your paper, an Abstract must be written last since it will summarize the paper.
2. Your statements on each aspect (or segment) of the paper should be limited to two or three sentences, if possible.

## **NOTE (CONT):**

3. Use concise, but complete, sentences, and get to the point quickly.
4. Use past tense.

## **THE ABSTRACT SHOULD NOT CONTAIN;**

- Lengthy background information,
- References to other literature [say something like, "current research shows that..." or "studies have indicated..."],
- Using ellipticals [i.e., ending with "..."] or incomplete sentences,
- Abbreviations, jargon, or terms that may be confusing to the reader, and
- Any sort of image, illustration, figure, or table, or references to them



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