



UNIVERSITY OF EMBU

**PROCEEDINGS OF THE DATA ANALYSIS WORKSHOP
USING THE R-SOFTWARE**

VENUE: COMPUTER LAB 3

DATE: 27TH JULY 2021 – 29TH JULY 2021

Rapporteur: Miss. Irene Wambui Mwangi

Edited by: Prof. Nancy Budambula

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Executive Summary

The Data Analysis Workshop on R-Software was held for three days starting 27th July 2021 and ending 29th July 2021. The workshop brought together 75 participants of whom 60 were postgraduate students. The workshop had two facilitators; Dr. Daniel Nthiwa and Mr. Joshua Muli who were introduced by the Director, Board of Postgraduate Studies (BPS). The Registrar, Academics, Research and Extension (ARE), Prof. Jackson Wachira, gave brief remarks on research. The Deputy Vice-Chancellor in charge of Academics, Research and Extension (DVC(ARE)), Prof. Kiplagat Kotut, gave welcoming remarks and invited the Vice-Chancellor University of Embu, Prof. Daniel Mugendi to open the workshop. In his opening remarks, the Vice-Chancellor (VC) noted that inadequate sample size, poor study design, poor research questions or poor objectives as well as poor or inadequate data analysis result in poor theses or low-quality publications. The workshop covered; the installation of R graphical user interface and R studio, R interface panels, variables and measurement scales, data structures used in R, common commands/functions in R, data coding and cleaning, data metafiles, data importation, merging files and data sub-setting, descriptive analysis and data exploration, inferential statistics, data visualization and other applications of R. The workshop had both theory sessions and practical sessions. The workshop was closed by the DVC (ARE), Prof. Kiplagat Kotut on, 29th July 2021.

Day One

Registration of participants as they arrived was done by the BPS secretariat. After participants had sat, Director, BPS, Prof. Nancy Budambula, made introductions, the Registrar, ARE, Prof. Jackson Wachira, made brief remarks and invited the DVC(ARE) to make welcoming remarks to the postgraduate students and invite the VC. The VC made his opening remarks and opened the three day workshop.

Theory and practical session 1: Mr. Joshua Muli

Mr. Joshua Muli guided the participants in the installation of R graphical user interface (RGUI) and R studio. He also showed the postgraduate students how to install RGUI and R studio. He explained the R interface panels and the variables and measurement scales that R software uses.

Theory and practical session 2: Dr. Daniel Nthiwa

Dr. Daniel Nthiwa taught data structures used in R, common commands/functions in R, data coding and cleaning and data metafiles. The postgraduate students wrote the commands//functions in the files they were guided to create and save. They also used two sample datasets for learning data structures, data cleaning and data metafiles.

In the afternoon, it was a full practical session for two hours and thirty minutes on what they had learnt in the theory and practical session 1 and 2.

Day Two

Registration of participants was done for Day 2 by the BPS secretariat.

Theory and practical session 3: Mr. Joshua Muli and Dr. Daniel Nthiwa

Mr. Joshua Muli data importation and showed the postgraduate students on how to import data using R. Dr. Daniel Nthiwa taught on merging data files and data sub-setting and gave a demonstration on how to merge data files and how to subset data.

Theory and practical session 4: Mr. Joshua Muli and Dr. Daniel Nthiwa

Descriptive analysis and data exploration was taught in iteration by Mr. Joshua Muli and Dr. Daniel Nthiwa. The trainers gave the postgraduate students sample data for analysis and exploration and took the students step by step on how to do descriptive analysis and data exploration.

In the afternoon, it was a full practical session for two hours and thirty minutes on what they had learnt in the theory and practical session 1, 2, 3 and 4.

Day Three

Registration of participants was done for day 3 by the BPS secretariat.

Theory and practical session 5: Mr. Joshua Muli and Dr. Daniel Nthiwa

Inferential statistics was taught in iteration by Mr. Joshua Muli and Dr. Daniel Nthiwa. The postgraduate students used provided sample data for inferential statistics and were taken through various approaches of using inferential statistics

Theory and practical session 6: Mr. Joshua Muli and Dr. Daniel Nthiwa

Mr. Joshua Muli taught on data visualization using R software followed by teaching on other applications of R by Dr. Daniel Nthiwa.

In the afternoon, it was a full practical session for two hours and thirty minutes on what they had learnt in the theory and practical session 2, 3, 5 and 6.

The DVC (ARE), Prof. Kiplagat Kotut, closed the workshop with a vote of thanks and closing prayer being done by a student.

List of Participants

Day One: 27th July 2021

1. Prof. Daniel Mugendi
2. Prof. Kiplagat Kotut
3. Prof. Jackson Wachira
4. Prof. Nancy Budambula
5. Dr. Daniel Nthiwa
6. Mr. Joshua Muli
7. Miss. Irene Mwangi
8. Mr. Gilbert Kemboi
9. Mr. John Nyaga
10. Mr. William Wachira
11. Mr. Edwin Serem
12. Mr. Elijah Njoroge
13. Mr. Joseph Wambugu
14. Mr. Shadrack Kirimi
15. Ms. Mercy Wanjiru
16. Mr. Allan Kagwi
17. Mr. Bernard Kemboi
18. Mr. Samuel Mutua
19. Mr. James Kimani
20. Ms. Gladys Kinya
21. Mr. Elishapan Mwenje
22. Ms. Monicah Muigai
23. Mr. Julius Letririo
24. Mr. Ryan Masai
25. Ms. Mary Mutesa
26. Ms. Margaret Njogu
27. Ms. Ephine Onyango
28. Ms. Lilian Munene
29. Ms. Tabitha Mwangi
30. Ms. Brenda Odoi
31. Ms. Dorcas Mokuah
32. Ms. Stella Karonji
33. Ms. Grace Kiringu
34. Mr. Victor Saoke
35. Ms. Christine Nzomo
36. Ms. Frida Nyaga
37. Ms. Agatha Njeru
38. Mr. Brian Mulonzi
39. Ms. Nancy Munubi
40. Ms. Jackline Ndegwa
41. Ms. Catherine Mumo
42. Ms. Mercy Rugendo
43. Ms. Maryliza Mukami
44. Ms. Cecilia Shinda
45. Mr. Esphorn Kibet
46. Ms. Purity Wahinya
47. Mr. Erick Ngaira
48. Mr. Dancan Muriuki
49. Mr. Rainard Mutuku
50. Ms. Naomi Mutie
51. Ms. Margaret Wachira
52. Mr. David Musyoki
53. Mr. Kelvin Wambugu
54. Mr. Elvin Otara
55. Ms. Purity Ceorge
56. Mr. George Kiriani
57. Ms. Jacqueline Gogo
58. Mr. Daniel Njiru
59. Mr. Bramuel Nyongesa
60. Mr. Amerdave Machuka
61. Mr. Kevin Macharia
62. Mr. Peter Irura
63. Ms. Bessie Murithi
64. Mr. Kelvin Wanjiku
65. Ms. Risper Muriuki
66. Ms. Milkah Keya

Day Two: 28th July 2021

1. Prof. Nancy Budambula
2. Dr. Daniel Nthiwa
3. Mr. Joshua Muli
4. Miss. Irene Mwangi
5. Mr. Gilbert Kemboi
6. Mr. Edwin Serem
7. Mr. Shadrack Kirimi
8. Mr. Elijah Njoroge
9. Mr. Joseph Wambugu
10. Ms. Mercy Wanjiru
11. Mr. Samuel Mutua
12. Mr. Elishapan Mwenje
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38. Mr. Dancan Muriuki
39. Mr. Rainard Mutuku
40. Ms. Milkah Keya
41. Ms. Purity Wahinya
42. Ms. Bessie Murithi
43. Mr. Evans Rutto
44. Mr. David Musyoki
45. Mr. Kelvin Wambugu
46. Ms. Brenda Odoi
47. Mr. Maurice Wanyonyi
48. Ms. Jacqueline Gogo
49. Mr. Jeff Kimanga
50. Mr. Bramuel Nyongesa
51. Mr. Daniel Njiru
52. Mr. James Karanja
53. Mr. Amerdave Machuka
54. Mr. Kelvin Munene
55. Mr. Kevin Macharia
56. Mr. Peter Irura
57. Mr. Berechiah Kibet
58. Mr. Lawrence Matuku
59. Mr. Jonathan Saina
60. Ms. Catherine Mumo
61. Ms. Nancy Munubi
62. Ms. Jackline Ndegwa
63. Ms. Mercy Rugendo
64. Ms. Maryliza Mukami
65. Ms. Cecilia Shinda
66. Mr. John Nyaga
67. Mr. Bernard Kemboi
68. Mr. Esphorn Kibet

Day Three: 29th July 2021

1. Prof. Kiplagat Kotut
2. Prof. Nancy Budambula
3. Dr. Daniel Nthiwa
4. Mr. Joshua Muli
5. Miss. Irene Mwangi
6. Mr. Gilbert Kemboi
7. Mr. Edwin Serem
8. Mr. Shadrack Kirimi
9. Mr. Elijah Njoroge
10. Mr. Joseph Wambugu
11. Ms. Mercy Wanjiru
12. Mr. Esphorn Kibet
13. Ms. Milkah Keya
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18. Ms. Naomi Mutie
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24. Mr. Amerdave Machuka
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26. Mr. Jonathan Saina
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60. Mr. Elvin Otara
61. Ms. Risper Muriuki
62. Ms. Purity George
63. Mr. George Kiriani
64. Ms. Bessie Murithi
65. Mr. Bramuel Nyongesa
66. Ms. Lilian Munene
67. Ms. Monicah Muigai
68. Mr. John Nyaga

Appendix 1: VC's Speech

SPEECH BY PROF. DANIEL MUGENDI NJIRU, VICE-CHANCELLOR

- Members of University Management Board
- Facilitators and Resource Persons
- Deans, Directors and Chairmen of Departments
- Academic staff
- University Librarian and library staff
- Postgraduate students
- Ladies and gentlemen

Good morning,

It is with great pleasure that I join you this morning for the first postgraduate students' workshop on data analysis. This workshop brings together about eighty postgraduate students of the University of Embu. It is my expectation that the training will equip you with hands-on skills on how to choose a study design, collect and analyze your data as well as interpret the same in manuscripts that can be published in high impact journals.

I take this opportunity to thank the organizers of this workshop the Director BPS Prof. Nancy Budambula, Dr Daniel Nthiwa a lecturer in the Department of Biological Sciences, and Mr Joshua Muli a tutorial fellow and PhD student in the Department of Biological Sciences for organizing this training.

Allow me to draw your attention to the following aspects of research that result in a poor thesis or low-quality publications.

- 1. Inadequate Sample size.**
- 2. Poor study design, poor research questions or poor objectives.**
- 3. Poor or inadequate data analysis.**

However good a study is, if the data is not well analyzed, it will result in a poor manuscript that can only be published in a low impact or sometimes predatory journal.

In view of the above, I urge all students to aim at acquiring the most out of this workshop as you will be expected to train other students on data analysis after this training.

Ladies and Gentlemen,

I wish you a very fruitful time and I hope that you will benefit immensely from this training. It is now my pleasure to declare first training for postgraduate students on data analysis officially opened.

**Thank you and God bless you all.
Prof. Daniel Mugendi Njiru, Ph.D
VICE-CHANCELLOR**

Appendix 2: Reference materials

The trainers provided diverse reference materials which were circulated to participants and other postgraduate students.