



Commission for University Education

Status of Post-Graduate Research and Training in Kenya

**Version 1
December 2016**

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December 2016.

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LIST OF ABBREVIATIONS AND ACRONYMS

CUE	Commission for University Education
EFA	Exploratory Factor Analysis
ICT	Information Communication Technology
MoE	Ministry of Education
MTP II	Vision 2030 Medium Term Plan II
NACOSTI	National Commission for Science, Technology and Innovation
QCA	Qualitative Content Analysis
R&D	Research and Development

CHAPTER ONE: UNIVERSITY RESEARCH OUTPUT AND NATIONAL RESEARCH PRIORITIES

1.1 Introduction

In 2011, Prof. Abulrazak, then CEO of the National Council of Science and Technology, remarked at a forum, “Why do we face drought, famine and floods, yet we have scientists in the country?”¹ This and similar questions challenge the role that universities should play in the development of the nation. As further challenged by the Principal Secretary for University Education, Prof. Suda in 2014, “Drylands constitute over 80% of Kenya’s land mass and occupied by about 35% of the population. This calls for transformative ... research that generates knowledge to inform development in these areas.”² But is research output related to Kenya aligned to national development priorities? Research that is well designed and executed should inform the development of policy that is effective, more efficient, and equitable. However, research output especially in developing countries, often fails to register any apparent impact.

As of December 2016, Kenya had a total of **70** universities spread throughout the country. These consist of **23** public universities and **17** private. Of the public universities, **23** are chartered and **10** are constituent colleges. For the private universities, **17** are chartered, **14** have letters of interim authority, **5** are constituent colleges, and **1** is registered. The full list is provided in Appendix A.

A key objective of development research is to improve lives, where public policy is often the key instrument in converting new knowledge to better lives and futures. For the policy making community on the other hand, systematic access to evidence-based research often improves the chances of deciding and carrying out policy that achieves the intended results and attracts strong support from the public. Researchers and policy makers, however, often do not find a common cause. Researchers can enjoy a unique advantage whenever decision makers express a real specific interest in receiving research information and guidance. Kenya's Vision 2030 provides common cause, the common blue print and road map for the country that both researchers and policy makers can hold on to. Based on Vision 2030, policy makers need timely research in the identified priority areas, while universities and research institutions are looked upon to provide this information. But have the researchers risen up to the challenge and expectation?

1.2 Kenya’s Development Blueprint, Vision 2030

Kenya's national development agenda is articulated in the nation's development blueprint,

1

Daily Nation, May 20, 2011

2

Daily Nation June 8 2014

Vision 2030. Vision 2030 has the objective of transforming Kenya into “a newly industrialising, middle-income country, providing high quality life for all its citizens, by the year 2030.”³ This will be realised through transformation of the Kenyan economy to an innovative one driven by technological innovation, a shift from knowledge-reproduction to knowledge-production, and ensuring the availability of a critical mass of well-qualified human resource to spur development. Human resource development as an essential enabler for an industrialising economy is acknowledged in Vision 2030, and can only come about as a result of quality education and training. The heart of this transformation will be the university education system that must be “focused, efficient and able to create knowledge, and deliver accessible, equitable, relevant and quality training to sustain a knowledge economy that is internationally competitive.”⁴

The national development agenda and priorities articulated in Vision 2030 is broken down into medium term plans, each covering five year periods. The country is currently in the second Medium-Term Plan (MTP II) covering the period 2013-2017. MTP II delineates the key policy actions, reforms, programmes and projects to be implemented during the period in line with the long-term objectives of Vision 2030, and the Constitution. The central theme of MTP II is *Transforming Kenya: Pathway to Devolution, Socio-Economic Development, Equity and National Unity*.

MTP II is anchored on three pillars, each with key focus areas that form part of the nation’s development agenda. The three pillars and respective focus areas are:

- i. The Political Pillar: Seeks to entrench a democratic people-centred political system. Focus areas are:
 - (a) Devolution
 - (b) Governance, and
 - (c) The rule of law.
- ii. The Economic Pillar: Focusses on seven priority areas:
 - (a) Tourism
 - (b) Trade
 - (c) Manufacturing
 - (d) Financial services
 - (e) Agriculture livestock and fisheries
 - (f) Oil and other mineral resources, and
 - (g) Business process outsourcing and IT enabled services.
- iii. The Social Pillar: Focusses on six priority areas:
 - (a) Health
 - (b) Education and training

3 Vision 2030

4 Sessional Paper No. 14 of 2012

- (c) Environment water and sanitation
- (d) Population, urbanisation and housing
- (e) Gender vulnerable groups and youth;
- (f) Sports, culture and arts.

The three pillars are anchored on seven core foundations or enablers:

- i. Infrastructure: with an emphasis on
 - (a) Accelerating ongoing infrastructure development, focusing on quality, aesthetics and functionality of the infrastructure services
 - (b) Provide a utility sector (water, sewerage and electricity) that is modern, customer oriented and technologically-enabled to provide efficient, cost-effective, and quality services to all citizens
 - (c) Create an inter-connected, technologically-advanced society with modern information and communication systems driving innovation, growth and social progress
 - (d) Protect the environment as a national asset and conserve it for the benefit of future generations and the wider international community, and
 - (e) Cultivate a social attitude of respect and care for public infrastructure facilities and services amongst all citizens.
- ii. Information and Communications Technology (ICT): in recognition of the important role ICT plays in accelerating economic growth, the government seeks to ensure a competitive telecommunications industry that is able to delivers reliable and affordable services and products.
- iii. Science, Technology and Innovation (STI): provides a focal area for wealth creation and improvement of the social welfare of the citizens and develop Kenya's international competitiveness.
- iv. Land Reforms: Policies and reforms that will address among others, proliferation of informal settlements, inadequate infrastructural services, congestion, environmental degradation, unplanned urban centres, pressure on agricultural and forest land, environmental degradation and conflicts.
- v. Public Sector Reforms: Reforms will focus on building and implementing service delivery systems that will ensure efficiency, quality, speed, convenience and dignity in service delivery.
- vi. Labour and Employment. Seeks to increase Kenya's global competitiveness through the development of healthy, motivated people with the right skills for the needs of the economy.
- vii. National Values and Ethics. The importance of national values is highlighted in the Constitution. National values build a tolerant culture based on diversity, with a preference to common nationhood.
- viii. Ending Drought Emergencies. Global climate change has made Kenya increasingly susceptible to natural disasters, primarily drought and flooding. This foundation seeks to better manage such disasters through strengthening people's resilience to drought and improving response to emerging drought

conditions.

- ix. Security, Peace Building and Conflict Resolution. Threats to security remain, especially in the face of international terrorism and domestic actors, the latter driven by relatively high unemployment rates. Security is a key enabler in attracting both domestic and foreign investment.

Key to realisation of the vision is the generation of a critical mass of research output addressing the country's major challenges and priorities, proposing solutions, and enabling the actualisation of the delineated flagship projects and programmes. Reading the mass media and listening to government officials gives the impression that universities are falling short on this crucial mission. This portion of the study sought to empirically answer the fundamental question: *Is the research output from universities aligned to Kenya's development agenda?*

1.3 Alignment of Universities Research Output to Vision 2030

A key measure of research output is publication in academic journals. Journal publications, therefore, was used as the population to determine the extent to which research on Kenya is aligned to the national development goals as delineated in Vision 2030. The team reviewed all journal publication as captured in Google Scholar that met the following criteria:

- Published between January 2015 and June 2016
- Had "Kenya" in the title, abstract or author affiliation
- No distinction was made between research carried out by Kenyan or foreign universities and research institutions

A total of 865 papers met the above criteria, and a random sample of 561 were reviewed and categorised according to the priority areas under each of the Vision 2030 pillars and foundations. Two additional categories were created: Not classified – papers that did not align to any of the Vision 2030 categories, but not business; Not classified business – non-aligned business papers. Business was singled out due to the large proportion on non-classified papers.

A summary of the number of papers within each of the broad pillars, foundations and added categories is presented in Figure 1.1. The vast majority of publications fall under the social pillar, followed by economic and the non-classified business. Drilling down into the economic pillar, as shown in Figure 1.2, a total of 13.4% of all papers fall within the priority areas of *agriculture, livestock and fisheries*. This is expected as agriculture, in its broadest sense, forms the back-bone of the Country's economy. What is surprising, however, is that despite Kenya aspiring to develop its *minerals and oil* reserves, as well as become a centre for business process outsourcing and internet technology enabled services (*BPO/ITES*), there are no papers published, that is no research output in these crucial areas.

Under the *Social Pillar*, displayed in Figure 1.3, *Health* dominates accounting for 26.9% of total publications followed a distant second within the pillar, and overall, by *Education and Training* at 11.8%. Key priority areas, *sanitation, population, housing, youth, sports, and urbanisation* have virtually no publications. There are a negligible number of publications under the *Political Pillar* with all three priority areas accounting for only 2.5% of all publications, as shown in Figure 1.4. Equally poor performance is realised under the *Foundations* where only *Science, Technology and Innovation (STI)* and *Public Sector Land Reform* manage to garner 2.5% and 2%, respectively. Other key priority areas under

the *Foundations* including ICT have also yielded dismal research output (Figure 1.5). It is worth noting that as shown in Figure 1.6 that the six priority areas – *health, environment, agriculture, livestock, fisheries* and *education & training* account for over 60% of the total research output.

From this analysis, research output from Kenya's research institutions, and those conducted by foreign institutions in Kenya are not well aligned, neither are they able to adequately meet the needs of the Country's development agenda. Whereas certain priority areas are well served, as shown in Figure 1.6, others are completely ignored.

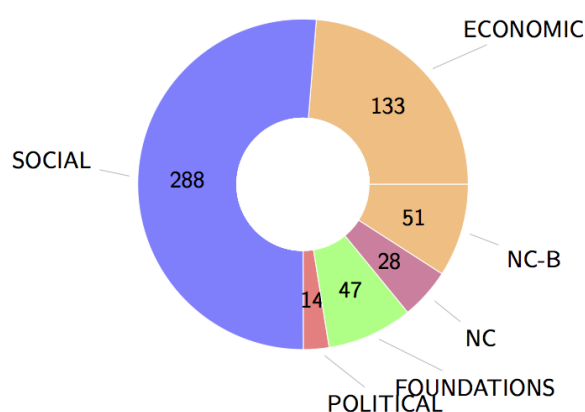


Figure 1.1 Number of papers in each broad Vision 2030 Category

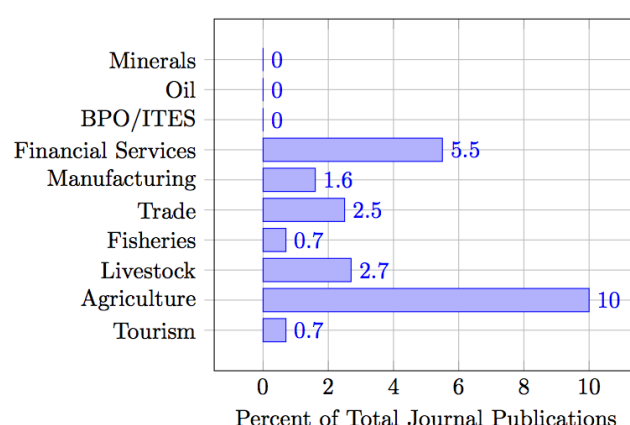


Figure 1.2 Distribution of papers under the economic pillar

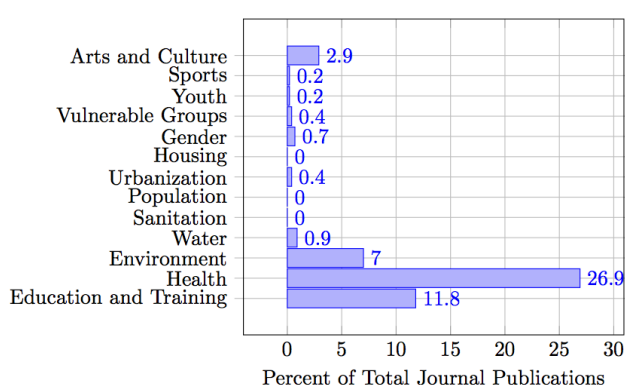


Figure 1.3 Distribution of papers under the social pillar

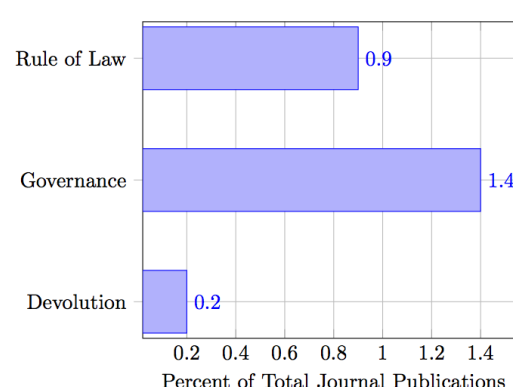


Figure 1.4 Distribution of papers under the political pillar

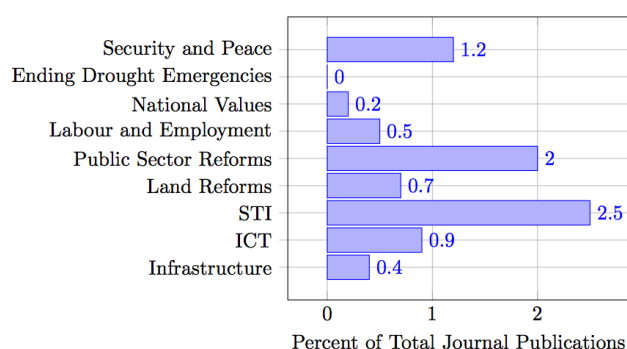


Figure 1.5 Distribution of papers under the foundations pillar

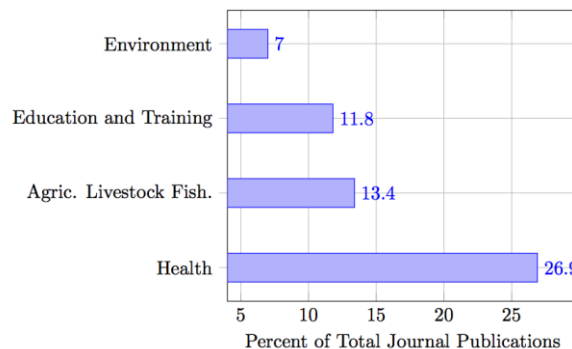


Figure 1.6 Areas covering 60% of all research

foundations

output (journals)

CHAPTER TWO: RESEARCH PROFILES OF SAMPLED INSTITUTIONS

2.1 Sampled Universities

For this part of the study, twelve universities were purposefully sampled, with an aim to seeking a balance between well established and new universities, as well as between public and private. The sample institutions were:

1. University of Nairobi*
2. Kenyatta University*
3. Egerton University
4. Maseno University*
5. Moi University
6. University of Eastern Africa, Baraton*
7. United States International University-Kenya
8. South Eastern Kenya University (SEKU)*
9. Pwani University
10. Mt. Kenya University
11. Strathmore University*
12. Technical University of Kenya*
13. Jaramogi Oginga Odinga University of Science and Technology

Despite constant reminders, responses were only received from seven institutions, marked with a star in the previous list. Each institution was asked to have the survey completed by five faculty members from each department offering post-graduate programmes. The majority of institutions did not provide the full depth (in terms of numbers of responses), with the science-based departments more responsive than the humanities and social sciences. In all there were 146 valid faculty responses received, spread over 77 departments. In terms of gender, the respondents comprised 40 women faculty members (27.4%), compared to 106 men (82.6%).

2.2 Descriptive Characteristics of the Sampled Universities

Several general metrics were collected at a departmental level from each institution. Note that these represent data only from the departments that submitted their data, which may not capture the totals for each institution. These descriptive characteristics are summarised below, presented as a gross total of the sample departments:

- Number of Female Post-Graduate Faculty – 273
- Number of Male Post-Graduate Faculty – 654
- Number currently registered Masters Students – 4136
- Number currently registered PhD Students – 796

In addition, the total number of PhD and Masters graduates for the past three years (2013, 2014 and 2015) were also collected, and are summarised in Table 2.1.

Comparison of the number of students registered for masters, vis-a-vis the number of graduates, using 2015 data yields a ratio of 3.26:1, demonstrating that about 32% of registered students graduate each year. This translates into students taking approximately three years to graduate. This is quite acceptable given that most Master students are part-time, with a full time daytime job. A similar review for the PhD students is alarming. The ratio of registered to graduates using 2015 figures yields a ratio of 13.3:1. *This translates to an average 7.5 years between registration and graduation.* Clearly well above the expected programme duration of four years.

CUE guidelines for supervision state that:⁵

“An academic staff shall be assigned students to supervise on thesis/dissertation based on a combination of his/her teaching load, administrative duties, and supervision experience and capacity. The maximum number of students an academic staff shall supervise in any given academic year shall be: Masters – 5, Doctorate - 3”

To what extent are these guidelines being followed? Information on supervision experience is from the sampled faculty is presented in Table 2.2. Descriptive statistics are presented on number of respondents, mean and standard deviation. Due to the large spread in the data, the maximum values are also provided. Recall that the number of respondents is provided to account for some faculty not providing answers to all questions. A review of the supervision load shows that the average number of students supervised per faculty member appear to be within the CUE guidelines. Noting, the large standard deviations – an indication of the spread of the data, coupled with the values for the maximum numbers demonstrates that a good number of faculty are still supervising students numbers well above the guidelines. Figures 2.1 and 2.2 display the number of faculty supervising different numbers of Masters and PhD students, respectively.

From Figure 2.1, 108 of the 138 sampled faculty are within the CUE supervision limit of 5; 30 representing 21.7%, however violate this limit, with some faculty over supervising 2-4 times the limit. For PhD students, and as shown in Figure 2.2, the level of violation is higher at 27.9%. It is expected that this situation will continue to negatively impact the quality of supervision, and this of research output. Violations were found to be spread across all broad disciplines including business, education, agriculture, public health and chemistry, amongst others.

Table 2.1 Descriptive statistics on Masters and PhD Graduates 2013-2014

Metric	2013	2014	2015
Total number of Masters Graduates	1182	1302	1267
Total number of PhD Graduates	32	51	60

⁵ CUE *Universities Standards and Guidelines*, 2014. October 2014

Table 2.2 Descriptive statistics on supervision load

Metric	Count (n)	Max.	Mean	Std. Dev.
FM102. Number of Current Masters Students as first supervisor.	140	24	4.93	7.23
FM103. Number of Current PhD students as First Supervisor.	146	9	1.79	1.96
FM104. Number of current masters students as second Supervisor	140	20	2.78	2.99
FM105. Number of PhD students as second supervisor	143	9	1.45	1.54
Fm106. Total number of Masters students supervised (Completed)	142	47	9.69	13.15
FM107. Total number of PhD students supervised (completed)	140	30	1.76	3.47

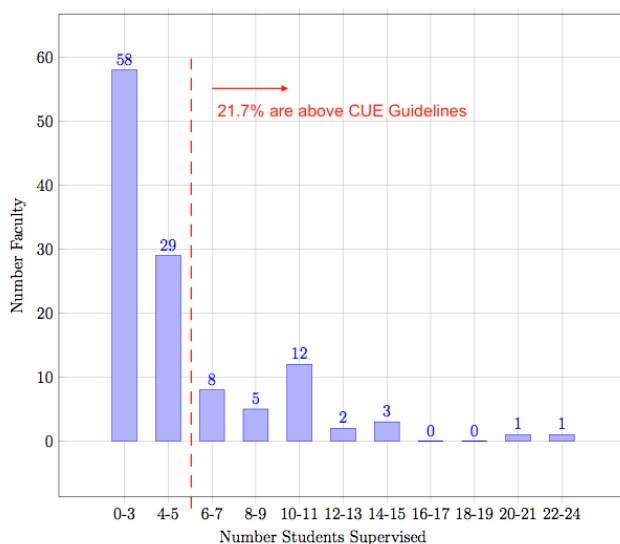


Figure 2.1 Number of faculty as first supervisor at various supervision loads for Masters students

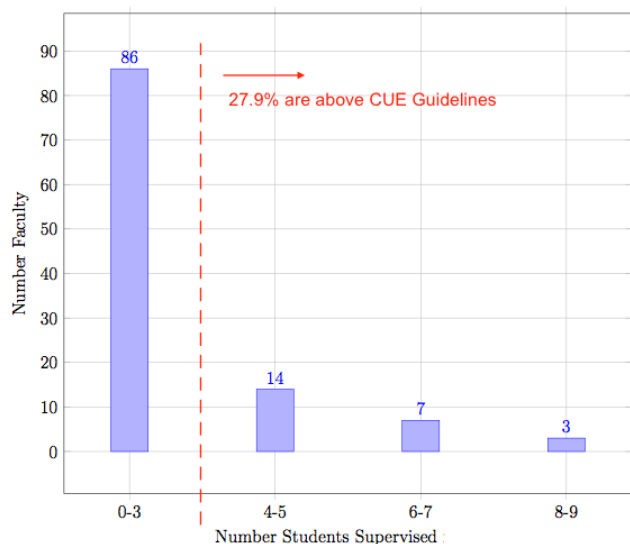


Figure 2.2 Number of faculty as first supervisor at various supervision loads for PhD students

CHAPTER THREE: CHALLENGES FACED IN PROVIDING QUALITY POST-GRADUATE SUPERVISION AND TRAINING

3.1 Introduction

Two approaches were used to determine the challenges faced by universities for supervision of post-graduate students. The first, a positivistic approach, used a structured questionnaire to pose fifteen questions covering areas where there is anecdotal evidence of challenges experienced. Anecdotal information was used as a review of the literature did not find a single article focussing on challenges faced in post-graduate research and training in Kenya.

The second approach, a phenomenological approach, used an open-ended question asking faculty to state the challenges they faced. This avenue made no pre-assumptions. Through use of grounded theory and content analysis, the responses were mined for the key themes and areas of concern. The two approaches when viewed together provide insights into challenges faced and therefore potential areas to be addressed in order to improve the quality of post-graduate research and training in Kenyan Universities. Each of the two approaches are presented separately in the following sections.

3.2 Main Thematic Areas for Challenges Faced – A Positivistic Approach

The fifteen questions posed were of the form: *To what extent does “[statement]” present a challenge to you providing quality PhD supervision.* The fifteen statements and their serial numbers are presented in Table 3.1. The latter will be used throughout the report for easy reference. Respondents selected from a 5-point likert-type scale on the the extent to which each of the fifteen statements posed a challenge to their effective supervision, where

1. Not a challenge
2. Small challenge that I can readily overcome
3. Moderate challenge that has hampered my being an effective supervisor
4. Big Challenge that is a major impediment to my being an effective supervisor
5. Very big challenge that has made it virtually impossible to be an effective supervisor

A summary of The responses to each of the questions are provided in Figures 3.1 to 3.15. Within each figure the total number of respondents, mean value and standard deviation are provided. The total number of respondents varies slight on account of some faculty not to answering all questions. In addition, the figures display the percent responses for each of the levels in the likert scale.

All post-graduate research and training programmes will face some level of challenges. To capture this, Likert levels 1 and 2 were taken to be “Acceptable”, while levels 3-5 were categorised as indicators of areas that “Require Urgent Attention.” The response levels for both of these broad categories for each question is also provided in the figures. This approach enables determination of areas require immediate interventions, and others that may not be as urgent.

Table 3.1 Statements interrogated as sources of challenges to effective PhD supervision

SN	Statement
FM108	Lack of payment for supervision of the student
FM109	Inability to attract PhD students
FM110	Management asks you to supervise and nurture an otherwise weak or disinterested student
FM111	Departmental politics in the allocation of supervisors and the management of students
FM112	Weak students who should be discontinued, not being discontinued
FM113	Students who only register as it is a condition of their employment, but otherwise lack motivation to proceed and complete programme
FM114	Students who come with scholarships that come with a research agenda that may not match yours
FM115	Lack of adequate research funding
FM116	Students who do the bare minimum to get by
FM117	Lack of a work plan and/or contract between student and supervisor
FM118	Too many students than one can comfortably manage
FM119	Weak Students.
FM120	Delays in procurement of research materials
FM121	Admission requirements for the PhD applicants allowing weak students into the programmes
FM122	Delays in receipt of research funds from the grants office

From the analysis, the following key conclusions can be drawn.

- *Lack of adequate research funding* appears to pose the biggest challenge. This view is reflected by 80% of respondents as an area that *requires urgent action*. Recent initiatives by the National Research Fund making available significant funds for research may begin to address this issue. Common sources of research funding, as identified by the faculty is presented in Table
- Other areas where over 60% of respondents expressed or indicated need urgent action include:
 - Students who only register as it is a condition of their employment, but otherwise lack motivation to proceed and complete programme

- Delays in procurement of research materials
- Weak Students
- Students who do the bare minimum to get by
- On the positive side, the area that presented the least challenge were *Departmental politics in the allocation of supervisors* with over 73% of respondents giving acceptable level ratings.
- Other areas where challenges faced are manageable and receiving *acceptable* responses of over 60% include:
 - Inability to attract PhD students
 - Management asks you to supervise and nurture an otherwise weak or disinterested student
 - Too many students than one can comfortably supervise

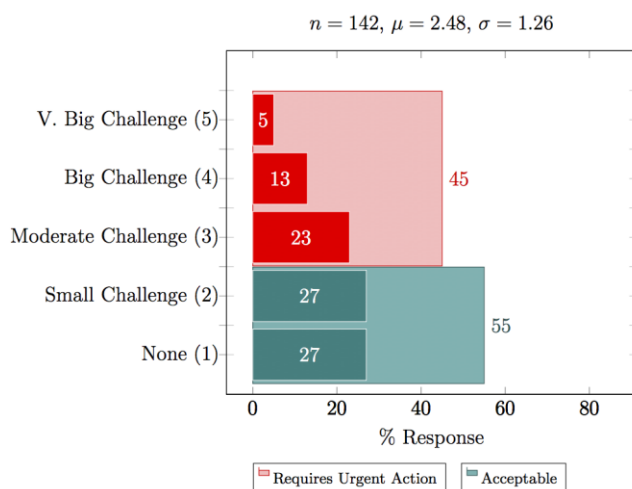


Figure 3.1 FM110 “Lack of payment for supervision of the student”

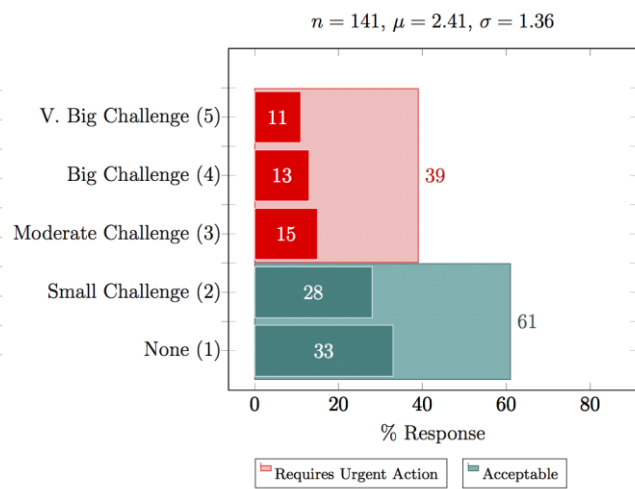


Figure 3.2 FM111 “Inability to attract PhD students”

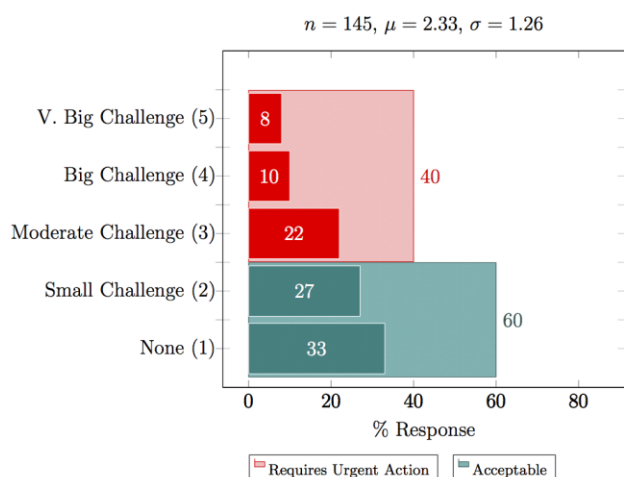


Figure 3.3 FM112 “Management asks you to supervise and nurture an otherwise weak or disinterested student”

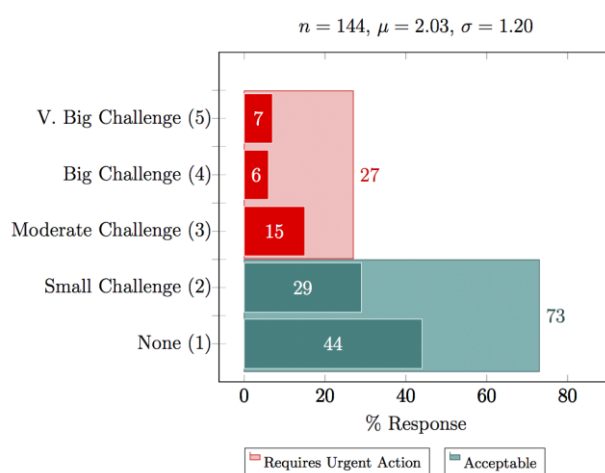


Figure 3.4 FM113 “Departmental politics in the allocation of supervisors and the management of students”

- Students who come with scholarships that come with a research agenda that may not match yours.
- It is important to note that even where the *acceptable* responses are over 60% a sizeable number of respondents felt that these areas *require urgent attention*. This also reflects the differences across institutions as well.
- The remaining areas, as shown below, exhibited a balanced split between those who are managing the challenges posed, and those who the challenges are a significant hindrance to quality supervision.

It is important to note that every institution should use these results in the context of their own location situation and make significant efforts to reduce the number of faculty who are seeking urgent action, thereby pushing the each of the items more and more to a level where the challenges presented are acceptable.

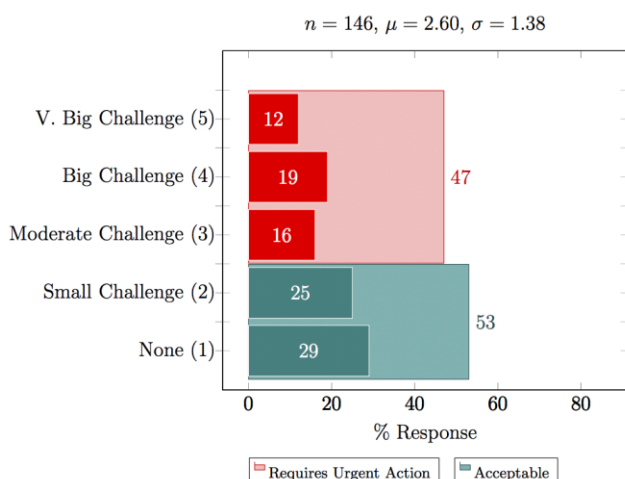


Figure 3.5 FM 114 “Weak students who should be discontinued, not being discontinued”

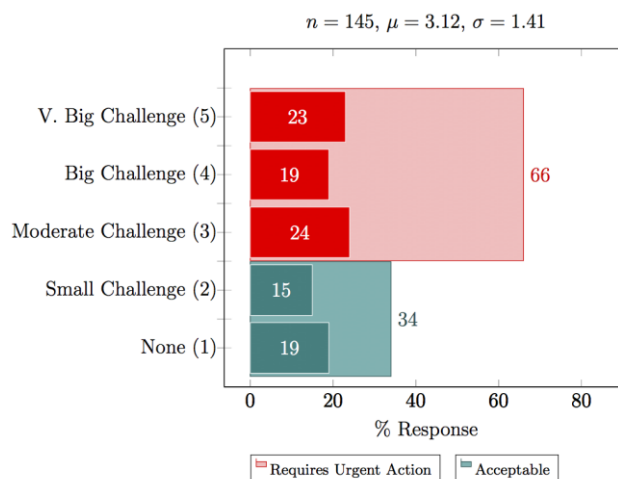


Figure 3.6 FM 115 “Students who only register as it is a condition of their employment, but otherwise lack motivation to proceed and complete programme”

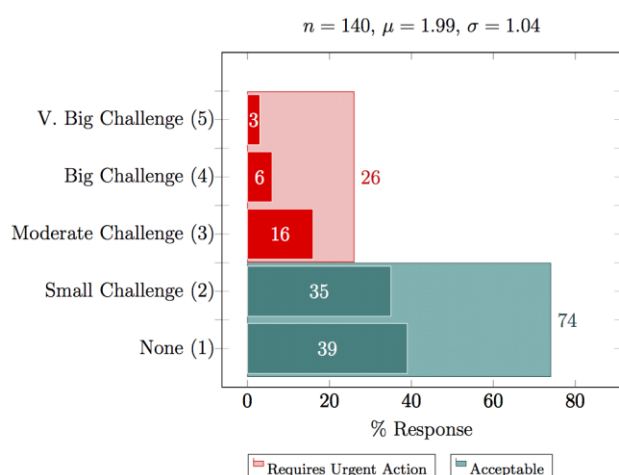


Figure 3.7 FM 116 “Students who come with scholarships that come with a research agenda that may not match yours”

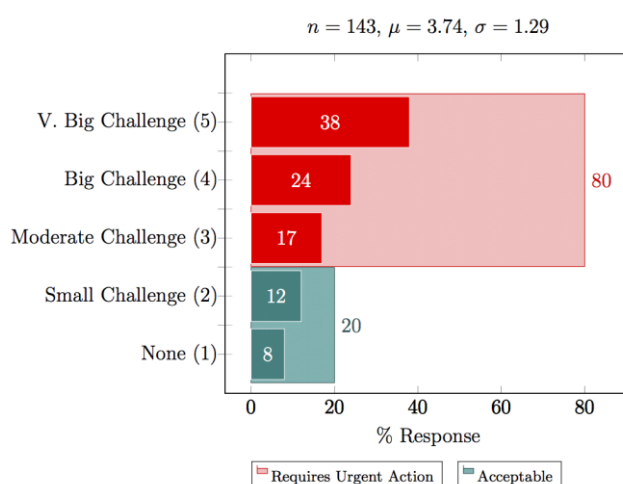


Figure 3.8 FM 117 “Lack of adequate research funding”

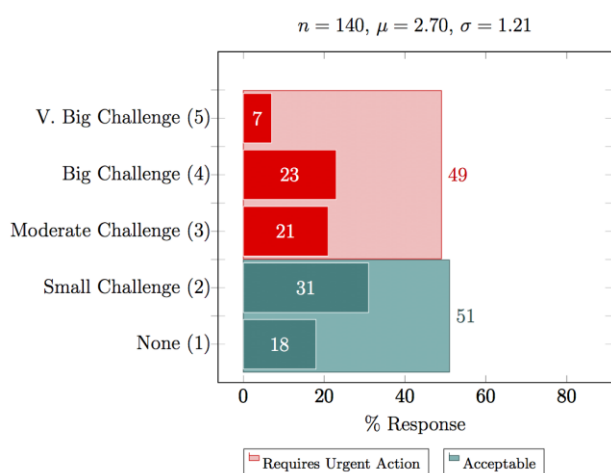


Figure 3.9 FM 118 “Lack of a work plan and/or contract between student and supervisor”

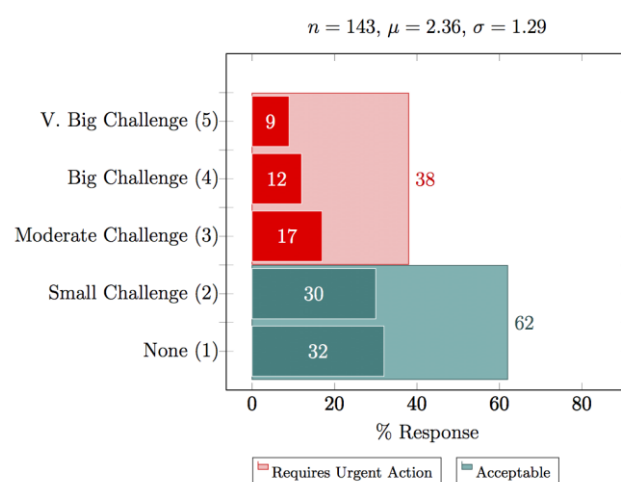


Figure 3.10 FM 119 “Too many students than one can comfortably supervise”

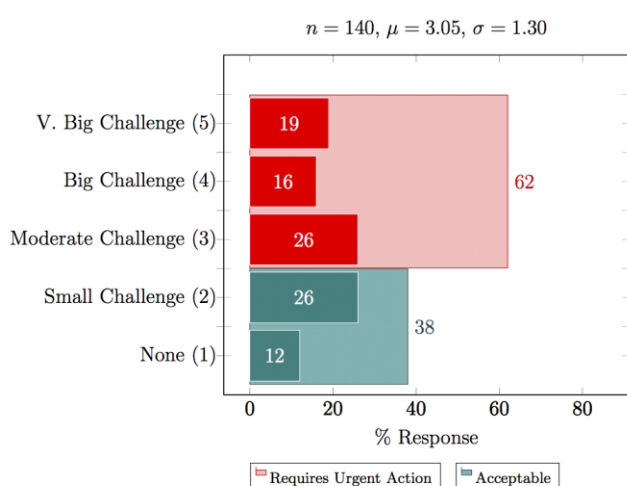


Figure 3.11 FM 120 “Weak Students”

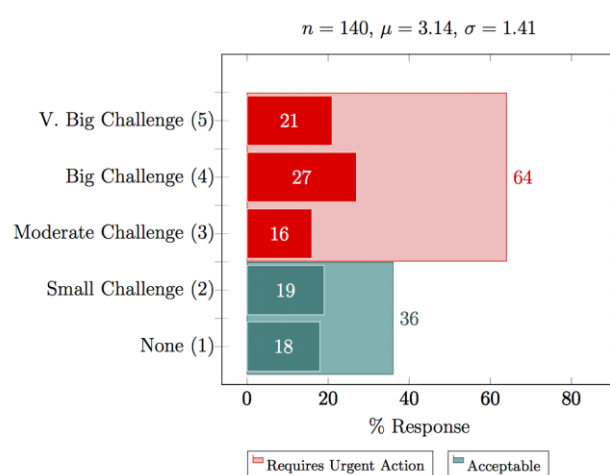


Figure 3.12 FM 121 “Delays in procurement of research materials”

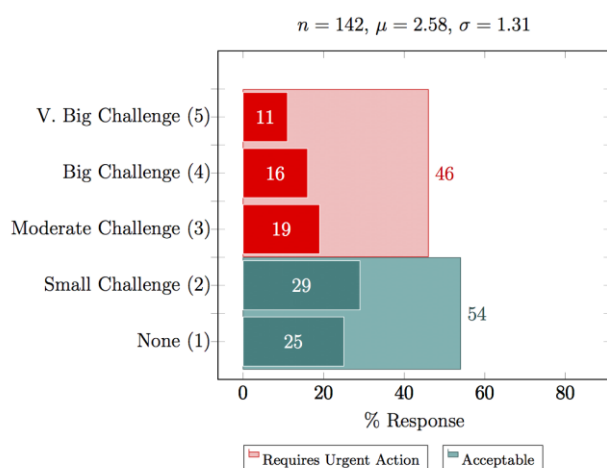


Figure 3.13 FM 122 “Admission requirements for the PhD applicants allowing weak students into the programmes”

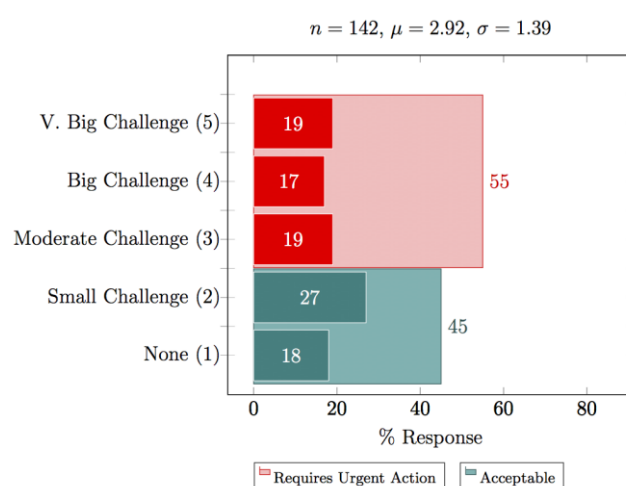


Figure 3.14 FM 123 “Delays in receipt of research funds from the grants office”

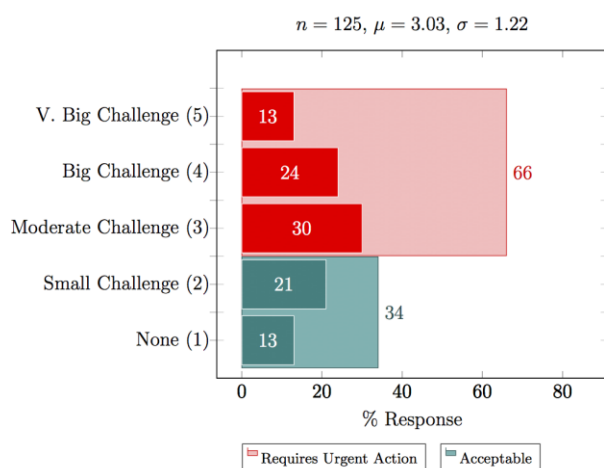


Figure 3.15 FM 124 “Students who do the bare minimum to get by”

Table 3.1 Common Sources of research funding

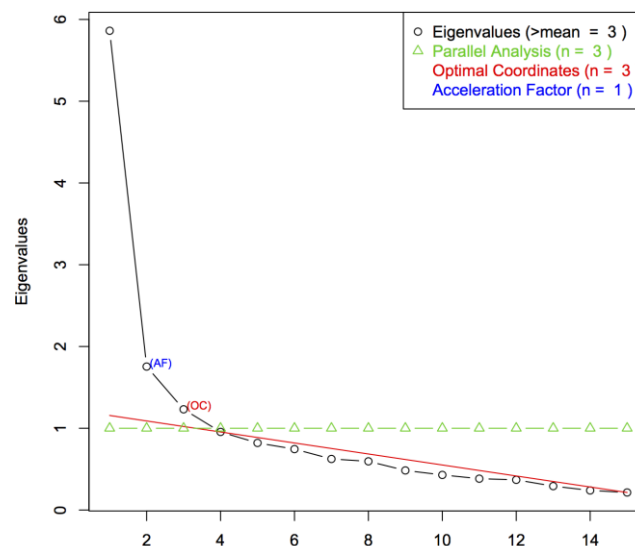
- | | |
|--|--|
| <ul style="list-style-type: none"> ● Self Sponsored ● Higher Education Loans Board (HELB) ● Internal research grants ● Partnerships with research institutes e.g. KALRO, KEMRI ● Internal programmes e.g. DAAD, Gandhi, Smarak, Third World Academy, International Foundation of Science ● University scholarships | <ul style="list-style-type: none"> ● NACOSTI ● Government Ministries as part of projects, e.g. Health, Agriculture, Defence ● Project based funding mainly from regional networks, e.g. ASARELA, RUFORUM ● International agencies -- AGRA, ICRAF, IDRC, SIDA, EU, AERC, NEWTON FUND (UK) |
|--|--|

3.2.1 Determination of Key Thematic Areas

Do the responses to the fifteen questions gravitate around a smaller set of thematic areas that may provide more insights? Do they form patterns that may be better interpreted and understood? Exploratory Factor Analysis (EFA) was used to answer these questions. Based on mathematical procedures to determine a smaller set of groups with shared variance, EFA is able to discover patterns in a set of variables.⁶ In other words, it discovers which variables best go together into descriptive categories. The EFA approach used Principal Components Analysis for the extraction of the maximum variance from the data set with each component. Rotation of the factors for better interpretation was done using the Varimax method that minimizes the number of variable with high loading on each factor.⁷

Care must be taken in the number of factors extracted. This can be done using eigenvalues and scree test. Figure 3.16 shows the scree test plot for the data. The plot maps factors (horizontal axis) with their corresponding eigenvalues (on the vertical axis). The line labelled *parallel analysis* is at the level of eigenvalue equal to one. Kaiser's criterion suggests that only factors whose eigenvalues are above 1 should be retained.⁸ From the Scree plot three factors are suggested. On carrying out the analysis there were nine, three, and three variables, clustered onto Factors 1, 2 and 3, respectively. The nine variables within one of the factors presented showed no apparent commonalities. The number of factors were therefore increased to four resulting in the corresponding thematic areas (and detailed in Table 3.2):

1. Factor 1 – Student quality, motivation and supervision alignment
2. Factor 2 – Administrative processes
3. Factor 3 – Barriers
4. Factor 4 – Management of the Supervision Process



6 Child, D. (2006) *The Essentials of Factor Analysis*, 3rd Edition, New York, NY: Continuum International Publishing Group.

7 Yong, A.G. And Pearce, S.,(2013) "A Beginner's guide to factor analysis: Focussing on Exploratory Factor Analysis", *Tutorials in Quantitative Methods for Psychology*, Vol 9 (2), pp. 79-94.

8 Kaiser, H. F. (1960). "The application of electronic computers to factor analysis." *Educational and Psychological Measurement*, Vol. 20, pp. 141-151.

Figure 3.16 Scree plot for determination of the number of factors to extract

Table 3.2 Loading of variables (questions) onto each of the four factors

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Key Themes
FM110	0.67				
FM112	0.76				
FM113	0.67			0.45	
FM116	0.52	0.39		0.32	
FM119	0.7				
FM121	0.7	0.48			
FM111	0.36				
FM114	0.38				
FM120		0.59	0.36		
FM122		0.84			
FM108			0.56		
FM109			0.58		
FM115			0.73		
FM118				0.65	
FM117				0.47	

Note: Values below 0.32 have been omitted for clarity

How then do faculty perceive challenges to supervision based on the four broad areas? A re-analysis of their responses clustered around the four factors is presented in Figures 3.17 to 3.20. Within the factors there is now less extremes in views. For all categories, however, but especially for *Factor 2 – Administrative Process*, urgent attention needs to be made to resolve the underlying issues as expressed by the responses to the variables that make up

the factor.

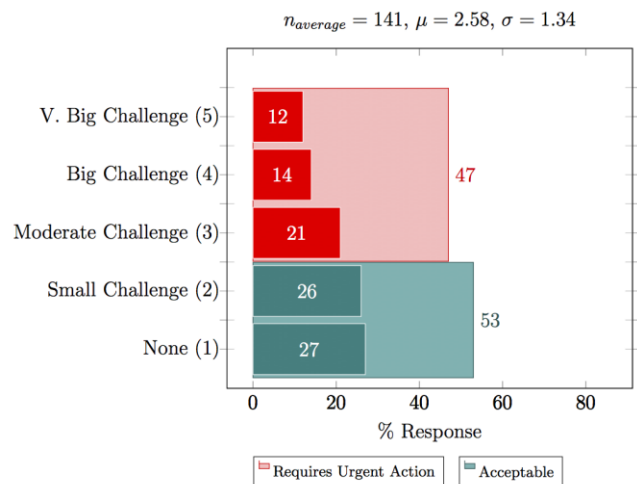


Figure 3.17 Factor 1 – Student quality, motivation and supervision alignment

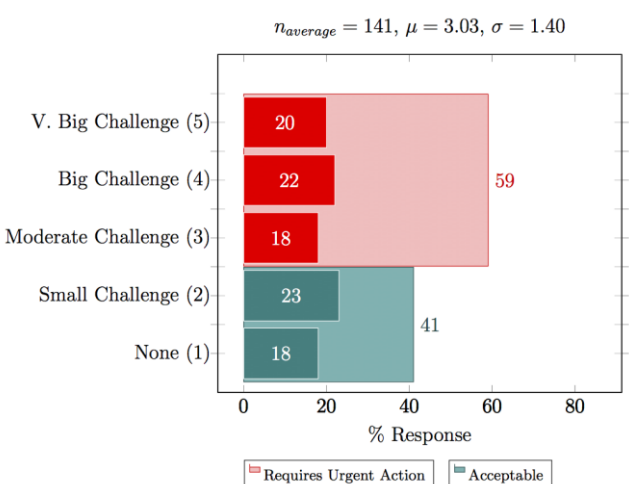


Figure 3.18 Factor 2 – Administrative processes

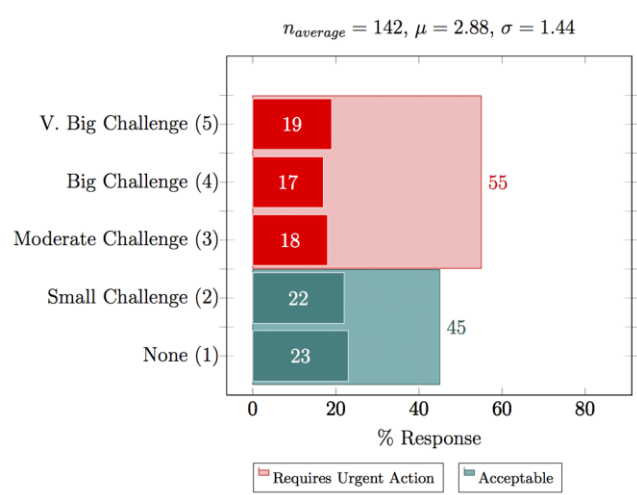


Figure 3.19 Factor 3 - Barriers

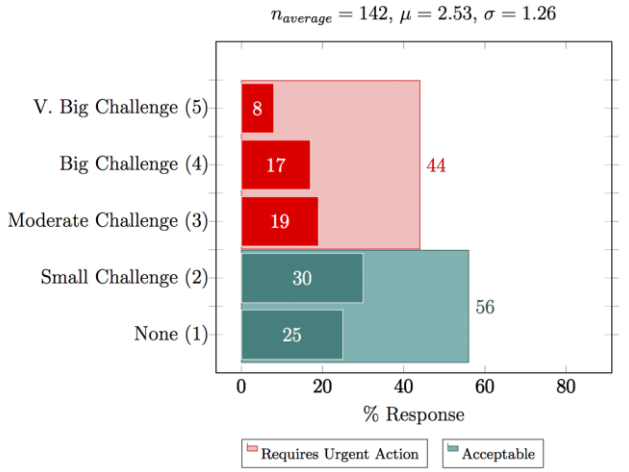


Figure 3.20 Factor 4 – Management of Supervision Process

3.3 Main Thematic Areas for Challenges Faced – Phenomenological Approach

Qualitative content analysis (QCA) was used as the phenomenological approach. QCA may be defined as “qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings.”⁹ It is inductive, “grounding the examination of topics and themes, as well as inferences drawn from them, in the data,”¹⁰ and is based on the grounded theory approach. The focus is to determine unique themes that can illustrate a range of interpretations of the issue at hand. Using QCA provide a good contrast to the positivistic approach in section 4.3 where the key themes for investigation were predetermined. With QCA, the themes that present challenges to the faculty are extracted directly from their responses. This information directly complements the positivistic results.

For this part of the study qualitative data was gathered by posing the following open-ended question: “*Please provide any comments you wish to make on the challenges you experience during Post-Graduate Supervision?*” There was no restriction placed on the number of issues that faculty could report on.

An emergent theme was taken as the unit of measure for the analysis. This could be expressed by a few words, a phrase or indeed a whole paragraph. The key focus was the expression of an idea. Development of the themes from the faculty responses used the constant comparative method. This involved the systematic comparison of text assigned to a theme, with the text already assigned to the same theme to ensure consistency, and to better understand the theoretical properties of the category. These were captured and continually updated in a coding table. The entire set of responses were analysed several times to ensure accuracy, and completeness. Where necessary, changes were made to the theme and the coding table updated accordingly.

Table 3.3 presents the 28 themes that emerged from the exercise. These were derived from a total of 154 responses. Within the table a description of each of the themes is given, when the coding was used, and an example quotation from the respondents provided to place the derived theme in better context. These themes do provide an insight into the areas of difficulties faced by faculty during post-graduate research and training, and that should be addressed by institutions. They also provide thematic areas that can be quantitatively explored further at a local institutional level, to establish which areas are at an acceptable level, and those that the institution must give urgent action in order to improve on the quality of post-graduate research and training.

The themes were further placed into a hierarchal structure with four broad categories, as shown in Table 3.4, based on their relationship amongst each other: Students, Barriers, Administrative, and Faculty. It is important to note the similarities with the previous themes derived from exploratory factor analysis. Also within the table are the actual counts of the number of times each theme was mentioned, and the corresponding level of mention as a percentage of the total. *Student* issues were mentioned almost equally with *barriers*, at 33.1% and 34.4%, respectively. Within these categories four themes stand out as a great challenge: Students not well prepared (9.7% of mentions), unmotivated students (12.3%), inadequate research facilities (14.3%) and inadequate research funds (14.9%). Though subtle in their differences, these findings correspond well with the quantitative results reported previously, especially for FM115 – Students who only register as it is a condition for their employment (66% requires urgent action, FM124 – Students who do

9 Patton, M. Q. (2002) *Qualitative Research and Evaluation Methods*. Thousand Oaks, CA: Sage.

10 Zhang, Y. and Wildemuth, B. *Qualitative Content Analysis* (Unpublished)

the minimum to get by (66%) and FM117 – Lack of adequate research funding (80%).

Table 4.3 Extraction of Themes and Typical Quotations from Open-ended Question

SN	THEME	DESCRIPTION	WHEN USED	Sample Quotes
1	Cost of programme	Money that students need to pay for the programme serving as a barrier to enrolment	Used for all references where cost of programme has been a barrier to getting students to enrol in the programme, or if they drop out as cannot continue fee payment	“The MSc programmes are new and being a new private university, the struggle of getting the best qualified candidates is proving to be a big challenge since most of the best potential candidates are not able to afford the programme fees.”
2	Students not well prepared	Students not adequately prepared for carrying PhD level work	Used in all references where students come into PHD programmes not adequately prepared for the level of rigour, including the quality of courses such as Research Methods and statistics, as well as poor writing skills.	“Many Kenyan universities are producing moderate masters’ students several of whom want to pursue PhD studies but lack requisite skills.” “There are also students who join post graduate studies but do not know the expectations and when they find the studies unmanageable, they give up or show non-commitment. Such students, would normally take a long time to finish their postgraduate studies.” “The quality of teaching research methods at postgraduate level in many of our universities is VERY wanting.”
3	Mismatch between student and supervisor	When faculty supervisors are not competent in the area for which they are supervising a student, or when conflicts arise between the	Used for all references to non-alignment of faculty areas of expertise and student research area. This could be as a result of faculty with research grants insisting on being first author, although not knowledgeable in the area. Also covers all references to conflicts between students and supervisors.	“Having a co-supervisor(s) who are not experts in the area of study contributes to the challenges.””A series of conflicts and interests between the supervisor and the students.”

SN	THEME	DESCRIPTION	WHEN USED	Sample Quotes
		supervisors and students.		
4	Timeliness of progress	Student progressing slowly, and their progress reports not submitted on time	Used for all references to slow student progress, for any of many reasons including limited consultation with supervisors, lack of proper tracking of progress system; where they do exist, progress reports not being submitted on time.	“More administrative support above departmental level is needed to emphasize the need by post-graduate students to follow timelines strictly.” “Most post-graduate students often fail to consult the supervisor when carrying out research, therefore resulting in students taking a long time to finish their work.”
5	Student availability	Students not being adequately available	Used for all references to unavailability of students due to many reasons including family obligations, working full time, etc.	“Most post-graduate students are mature with families and demands on them to 'provide' often overwhelms the.””Students treating their studies as part-time since they are adults and pre-occupied with non-academic issues.”
6	Student status	Difficulty in determining the registration status of students	Used for all references of difficulty establishing the registration status of a student, whether they are still active or not.	“Unclear status of students, whether they are bona fide/real students or just names on a list.”

SN	THEME	DESCRIPTION	WHEN USED	Sample Quotes
7	Research and supervision policies	Existing approved policies are not implemented or the lack of necessary policies	Used for all references to existing institutional policies, for example, research policy, not being followed or not developed and implemented. Also includes lack of good quality guidelines or standards on thesis or dissertation preparation and expectations	“Lack of a procedural process for supervision.”
8	Inadequate research facilities	Existing research infrastructure unable to support desired research activities	Used for all references to obsolete equipment or infrastructures including ICT systems, disrepair, lack of required research inputs, for example chemicals; office or meeting space for post-graduate students.	“Research labs are inadequate, research facilities in the lab require improvement to compete with world class universities; research equipment should be modernized.”
9	Poor coordination between departments and graduate school	Where coordination between the graduate school (or equivalent body) and the departments is a barrier	Used for all references of poor coordination of activities between the graduate school (or equivalent body) and the faculty in the departments	“Poor coordination and information between Board of Post-Graduate Studies and departments.”
10	Inadequate research funds	When a researcher does not have funds to carry out intended research activities	Used for all references that mention funding as a barrier to carrying out desired research	“A lot of research funding has moved from basic sciences to the applied sciences hence those in basic sciences like us may not attract students.”
11	Mismatch between funded research objectives and student interests	When the objectives of the funded research project do not align with the students interests	Used for all references to mismatch between funded research objectives and students’ academic interests.	“The [students] offered research funds sometimes do not share in the objectives of the project. In the process they delay the work and some are not fully committed.”

SN	THEME	DESCRIPTION	WHEN USED	Sample Quotes
12	Unmotivated students	Students that seem to lack personal drive and need to be constantly pushed	Used for all references of unmotivated students who need to be pushed, students who lack self-drive, who seem disinterested in their studies; take a long time to do corrections or to collect data; are not creative or innovative in their ideas; Using consultants to write their proposals, and thesis.	“When students do not consult supervisors in a long while let alone once a month or do not submit quarterly reports, absent students who show up at own discretion, nonchalant type.”
13	Language	Foreign students who have challenges understanding English	Used for all references where the understanding of and communicating (written and verbal) in English is a challenge.	“Inadequate academic literacy of postgraduate students whose mother tongue is not English.”
14	Procurement process	All aspects of the procurement process using research funds	Used for all references to difficulties in having research items – equipment, reagents, inputs, supplies, – procured on time, and the desired quality	“Procurement delays in purchase of chemicals; it is like a system put to frustrate research.”
15	Training on supervision	Training faculty on post-graduate student supervision	Used for all references to need for training on all aspects of post-graduate supervision and research	“Proper induction of supervisors is very essential to alleviate the problem of lack of knowledge of proper procedures to be used in supervision.”
16	Selection of research topic	Time for students to select a research topic	Used for all references to challenges and delays in students selecting their research topic.	“Delay in students getting realistic topics for study on time.”
17	Students following established guidelines	Students do not follow the institutional guidelines and procedures	Used for all references to students not following established guidelines, procedures, or regulations	“Failure by students to meet guidelines on research/course.”

SN	THEME	DESCRIPTION	WHEN USED	Sample Quotes
18	Diverse research directions from co-supervisors	Co-supervisors giving students different research directions	Used for all references to confusion of student due to different instructions and research directions given by co-supervisors	“Co-supervisors having different opinions or agendas. This tends to confuse/frustrate the student.”
19	Minimum starting cohort	Classes need a minimum number of students to be able to start	Used for all references on the inability to meet the minimum number of students before a cohort for the class to run.	“Meeting the minimum students required per session/cohort.”
20	Grant management process	All aspects of the research grant management process	Used in all references to the challenge arising from the grant management process including timely access to funds, proper accounting for funds.	“Processing of research grant imprests is a nightmare and sometimes negatively affects research and timelines.”
21	Payment for supervision	Payment to supervisors on completion of supervision	Used in all references to payment for supervision of post-graduate students by the university.	“Supervisors are not adequately facilitated to carry out post-graduate supervision.”
23	Publications	All aspects related to publication students work	Used for all references to challenges in publication emanating from student research work. This include lack of interest by students who simply need degree for promotion	“Those undertaking studies for the sake of being promoted have no interest in publications yet the supervisor cannot publish as first author.”
24	Over-burdened faculty	Workload for staff is very high, hindering adequate time for supervision	Used for all references to challenges in availability of faculty to students due to being overstretched including too many students, management responsibilities, etc.	“Supervision load is never timetabled nor counted when teaching load is distributed.””The student staff ratio is not appropriate. Too many students and very few faculty members to supervise. The administration listens to the students who complain about low

SN	THEME	DESCRIPTION	WHEN USED	Sample Quotes
				response rate from supervision but they do not listen to the staff cry on the need for more staff.”
25	Favouritism	When faculty award marks, grades or allow to pass to non-deserving students	Used for all references to faculty enabling students to proceed, or award marks and scores to non-deserving students as a favour to them.	“There is a political agenda among staff who want certain students known to them to pass during defences.”
26	Taxation on equipment	Taxes imposed on donated research equipment and consumables.	Used for all references to challenges brought on by taxes imposed on donated research items including equipment and consumables.	“Equipment and consumables bought through grants or donated taxed by KRA.”
27	Research themes/ Groups	Presence of research thematic areas or groups in the departments/schools	Used for all references of need for research thematic areas and teams/groups in the departments and schools to enable directed research.	“Lack of research themes and ongoing research projects in the department.”
28	Equitable allocation of students	Allocation of students for supervision in a manner not seen to be fair or transparent	Used for all references to unfair allocation of students for supervision; favouritism in allocation; intimidation by senior faculty during allocation.	“Scrambling over students by well-established scholars over starters.”

Table 3.4 Hierarchal Structure from Content Analysis

SN	CATEGORY AND SUB-CATEGORIES	COUNT	PERCENT
I	STUDENTS	51	33.1
	Students not well prepared	15	9.7
	Language	2	1.3
	Student availability	12	7.8
	Unmotivated students	19	12.3
	Selection of research topic	1	0.6
	Students following established guidelines	1	0.6
	Publications	1	0.6
II	BARRIERS	53	34.4
	Inadequate research funds	23	14.9
	Cost of programme	5	3.2
	Inadequate research facilities	22	14.3
	Minimum starting cohort	1	0.6
	Taxation on equipment	2	1.3
III	ADMINISTRATIVE	31	20.1
	<i>Institutional</i>	17	10.9
	Grant management process	3	1.9
	Procurement process	8	5.2
	Student status	1	0.6
	Research and supervision policies	4	2.6
	Poor coordination between departments and graduate school	1	0.6
	<i>Departmental</i>	14	8.9
	Mismatch between funded research objectives and student interests	1	0.6
	Mismatch between student and supervisor	5	3.2
	Timeliness of progress	5	3.2
	Research themes/groups	2	1.3
	Equitable allocation of students	1	0.6
IV	FACULTY	19	12.3
	Training on supervision	3	1.9
	Diverse research directions from co-supervisors	1	0.6
	Payment for supervision	7	4.5
	Over-burdened faculty	7	4.5
	Favouritism	1	0.6
	TOTAL NUMBER COMMENTS (SOME FACULTY GAVE MORE THAN ONE, OTHERS NONE)	154	100

Theme 8, inadequate research facilities, was one of the areas explored in the survey. Department heads were asked to indicate the key equipment they would need to be able to improve on their post-graduate research and training, and conduct cutting-edge research. A summary of the recurring larger equipment and facilities from the sampled departments is provided in Table 3.5. This listing can inform the efforts of the National Research Fund, who have issued a call for the purchase of research equipment that can be shared across institutions.

Table 3.5 Summary of equipment and facilities needs of sampled departments

- | | |
|--|--|
| ● Computer labs | ● X-ray diffractometer |
| ● Electron microscope | ● Laboratory space |
| ● High performance liquid chromatograph | ● Computer labs |
| ● DNA sequencer | ● Digital photogrammetric workstations |
| ● Mass spectrometer | ● Geodetic GNSS receivers |
| ● Gas liquid chromatograph | ● CAD software |
| ● Spectrophotometers | ● GIS remote sensing |
| ● Post-graduate study room | ● Rotary evaporators |
| ● NMR | ● Planning studio laboratory |
| ● Weather station | ● Ultra-violet spectrophotometer |
| ● Scanning electron microscope | ● Atomic absorption spectrophotometer |
| ● Liquid chromatograph mass spectrometer | ● Dental operating microscope |
| | ● Vickers hardness testing machine |

CHAPTER FOUR: RECOMMENDATIONS

From a sample of universities covering young and old, public and private, this study sought to determine the key issues and challenges faced in delivering quality post-graduate research and training, and obtain a snap-shop profile of the demographics and supervision loads carried by post-graduate faculty. The biggest challenge in the exercise was getting data from the institutions. Despite this, an analysis of the data reveals some key insights and provides a foundation for future investigations.

From the study, the following recommendations are made:

- 1. Graduation Timelines** – It appears that by and large, Masters students graduate within acceptable timelines. There is however a severe problem with graduate timelines for PhD students. This needs to be addressed by the Commission through participatory engagement with individual institutions to address the underlying causes, many of which were brought out in the study in Section 3.2.
- 2. Supervision Load** – From the sampled institutions, 21.7% and 27.9% of faculty are supervising students beyond the Masters and PhD CUE guidelines, respectively. This is primarily not as a result of refusal to comply, but due to insufficient faculty members to service the number of students, juxtaposed on Universities unable to afford to hire more faculty members into those departments. This contradiction needs to be addressed as a national issue if quality is to be maintained in post-graduate training. CUE can take on a leading role, working with universities and the government to seek a solution.
- 3. Student Availability and Motivation** – From both the positivistic and phenomenological approaches, student availability and motivation came up as a key issues. Student availability is as a result of most post-graduates are part-time students, full-time work, taking classes in the evenings and weekends. This is unlike most developed countries where students are full time, mainly due to scholarships and assistantships (both research and teaching) availed to them. This enables the students fully commit their time to their post-graduate work. The need for more post-graduates, especially PhDs to fill the large number of unfilled faculty positions is agreed upon. Yet very little government funding is made available. Similar to the government-sponsored programmes for undergraduates, a similar programme should be established for post-graduate students. This should be coupled with a critical look at the admission criteria, especially for PhD students, to ensure that only students who are indeed motivated for rigorous PhD work are admitted.
- 4. Management of Research Grants and Procurement** – Universities must put in place strategies to ensure management of research grants and procurement from research funds is separated from the mainstream financial and procurement processes of the university. Even for universities with separate grants offices, their faculty expressed concern at the major delays in accessing funds. These separate units should have staff experienced in grant management, familiar with funder requirements, and sensitive to the timeliness of their work in order for researchers to meet the agreed upon research project timelines. Those in procurement, within these separate units, should be well-versed in the requirements and needs of the researchers in their institutions. Not having to constantly follow up on funds or procurements will allow researchers to focus their attention on their academic work and students.

5. **Themes on research challenges** – The study has presented the first detailed and broad investigation into challenges to post-graduate supervision and training as perceived by the faculty members. These themes as detailed in Table 4.3 presented areas for institutions, individually and the Commission, collectively can address and improve on quality.
6. **Tracking performance** - A dynamic data base needs to be established by CUE that allows for a constant input of the variables used in this study by all Universities. This should be integrated in the Performance Contract as one of the required indicators. This will allow for monitoring of the research arena in all universities.
7. **Information access** - The results from this study, the Supervision Policy and the Code of Conduct need to be availed immediately online with a window for feedback so that these documents can be constantly improved.

Annex 1: Universities Serial Numbers

Serial Number	Year of Establishment	Name of University
Public Chartered Universities		
1	1970	University of Nairobi
2	1984	Moi University
3	1984	Kenyatta University
4	1987	Egerton University
5	1994	Jomo Kenyatta University of Agriculture & Technology
6	2001	Maseno University (Maseno)
7	2007	Dedan Kimathi University of Technology
8	2007	Chuka University
9	2007	Technical University of Kenya
10	2007	Technical University of Mombasa
11	2007	Pwani University
12	2007	Kisii University
13	2007	Masinde Muliro University
14	2008	Maasai Mara University
15	2008	South Eastern Kenya University
16	2008	Meru University of Science and Technology
17	2008	Multimedia University of Kenya
18	2009	Jaramogi Oginga Odinga University of Science and Technology
19	2009	Laikipia University
20	2009	University of Kabianga
21	2010	University of Eldoret
22	2010	Karatina University
23	2011	Kibabii University
Public University Constituent Colleges		
24	2011	Embu University College (UoN)
25	2011	Kirinyaga University College (JKUAT)
26	2011	Garissa University College (MU)
27	2011	Murang'a University College (JKUAT)
28	2011	Machakos University College (KU)
29	2011	Rongo University College (MU)
30	2011	Taita Taveta University College (JKUAT)
31	2011	The Co-operative University College of Kenya (JKUAT)
32	2015	Kaimosi Friends University College (MMUST)
33	2015	Alupe University College (MU)
Private Chartered Universities		
34	1989	University of Eastern Africa, Baraton
35	1989	Catholic University of Eastern Africa (CUEA)
36	1989	Daystar University

Serial Number	Year of Establishment	Name of University
37	1989	Scotts Christian Universty
38	1989	United States International University
39	1989	St. Paul's University
40	1989	Pan Africa Christian University
41	1989	Africa International University
42	1989	Kenya Highlands Evangelical University
43	1993	Africa Nazarene University
44	1997	Kenya Methodist University
45	2002	Strathmore University
46	2002	Kabarak University
47	2006	Great Lakes University of Kisumu
48	2007	KCA University
49	2008	Mouny Kenya University
50	2008	Adventist University of Africa
Private University Constituent Colleges		
51	1993	Hekima University College (constituent CUEA)
52	1997	Tangaza University College (CUEA)
53	2002	Marist International University College (CUEA)
54	2010	Regina Pacis University College (CUEA)
55	2012	Uzima University College (CUEA)
Institutions with Letter of Interim Authority (LIA)		
56	2002	Kiriri Women's University of Science & Technology
57	2002	Aga Khan University
58	2006	GRETSA University
59	2007	Presbyterian University of East Africa
60	2009	Inoorero University
61	2010	The East African University
62	2011	GENCO University
63	2011	Management University of Africa
64	2012	Riara University
65	2012	Pioneer International University
66	2013	UMMA University
67	2014	International Leadership University
68	2014	Zetech University
69	2015	Lukenya University
Registered Private University		
70	1989	KAG – EAST University