Scaling Up Training in Forestry and Environmental Courses in Kenya: Reflection on Challenges and Opportunities in Newly Established Universities

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Abstract

The period 2011-2012 observed expanded University education in Kenya. Some newly established Universities launched curricula and training in forestry, agroforestry and other environmental courses which are universally known pillars of sustainable development and social wellbeing. This paper presents information on student's admissions and enrolment in these programmes as well as challenges and opportunities in curricula delivery, form a national opinion and derive areas of improvement and recommendations. Findings in this paper contribute to streamlining forestry and environmental education, research and training while addressing emerging issues and challenges of the 21st century. Data was collected from University of Kabianga between 2011/2012 and 2015/2016 academic years. Data from University of Eldoret, Moi University, South Eastern Kenya University and Karatina University were used for comparison purposes. Statistics on students' admissions and enrolment from 2004/2005 to 2014/2015 were used to cover periods before and after expansion of Universities. The study revealed a positive strong correlation between increasing the number of Universities on the levels of students' admissions and rate of enrolment in Kenya. Diversification of programmes within any given University also indicated positive effect on levels of students' admissions and enrolment rates. However, high rates of late reporting and deferment of courses hint at University education challenges to be addressed. Kenyan Universities also face challenges in staffing, capacity for staff development, inadequate facilities, specialized field laboratories and internship opportunities. In short and midterm, promotion of digital learning platform such as video conferencing would enhance sharing of scarce academic staff, while purposive increased scholarships, exchange programmes and exchequer facilitation to support mobility to the field and develop field facilities for selected specializations would motivate the society and enhance relevant quality education.

Key words: Admissions, Enrolment, Professionalism, Scholarships, Specializations

Introduction

The forestry and environmental management sector in Kenya face challenges in building capacity for sustainable utilization and management of resources (Republic of Kenya, 2014). Objective 3.3 (i) of the 2014 Forest Policy in Kenya advocates for intensifying support to forestry research, education, communication and public awareness. Further, Chapter two, article 2.1.1 (g) acknowledges insufficient scientific information for technological development and informed decision-making as one of the key challenges of the forestry sector in the country. Therefore, the policy reiterates the need to give high priority to investment in forestry research, training and education. Quality forest management begins from having a strong educational foundation; and the right tools and resources (Society of American Foresters, 2015). During this era where forestry profession and allied courses are among the least preferred courses by the current generation in Kenya and elsewhere, there is a need to streamline and support forestry and environmental education through effective training and research with a view of reducing environmental challenges and attracting students to these disciplines.

Justification

To redeem the standard of forestry profession and allied programmes for the wellbeing of mankind and for sustainable development, there is need for self-evaluation of training institutions to align the curricula to relevant issues and enhance their popularity in the society and among stakeholders. Similar self-evaluation is needed by the employers, funding institutions and mainstream Government departments. Indeed, deep reflection is required from all the people concerned and touched by the degrading state of environment, forests and natural resources therein, water resources, biological diversity, tourism and wildlife as well as climate change and livelihoods issues in urban, rural, high potential and low potential areas including arid and semi-arid environments.

Purpose and Objectives of this Study

The purpose of this study was to inform and derive areas of improvement and recommendations, which authors believe will contribute to streamlining forestry education, research and training in addressing emerging forestry issues and challenges of the 21st century.

The following three objectives were addressed in this study to:

(i)   Analyze expansion of training in forestry and environmental courses in Kenya;

(ii) Identify challenges within newly established Universities offering forestry and environmental courses;

(iii) Determine opportunities to scale up quality training, research and innovation in forestry and environmental courses in newly established Universities.

Historical Perspective of Forestry and Environmental Education in Kenya

Bachelor of Science (B.Sc.) in Forestry programme for East African students (Kenya, Uganda and the United Republic of Tanzania) started in 1970 in the University of East Africa (now Makerere University) in Uganda. In 1973, the Government of the United Republic of Tanzania started a Department of Forestry at Morogoro Campus of the University of Dar es Salaam. Later, in 1984, the Department was elevated to full faculty status following the upgrading of the Morogoro Campus into a full fledged University, Sokoine University of Agriculture. Following the collapse of the East African Community and political unrest in Uganda, Kenyan students pursuing forestry in Makerere University Uganda were transfered to Department of Forestry at Morogoro Campus of the University of Dar es Salaam.

In 1977, Kenya started its own forestry degree programme at the University of Nairobi, using the curriculum borrowed from the Department of Forestry at Morogoro. In October 1984, the Department of Forestry at the University of Nairobi was transfered to Eldoret and was the pioneer program in the newly established Moi University. At the same time, BSc in Wood Science curriculum was introduced. In 2005, BSc Agroforestry and Rural Development curriculum was introduced in Moi University. Until 2011, training in BSc Forestry, BSc. Agroforestry and BSc. Wood Science was mainly done in Moi University at Chepkoilel University College (now University of Eldoret). To a limited extent, a few other Universities were teaching subjects in Forestry or Agroforestry. Moi University kept on reviewing its curricula in forestry to meet emerging needs and challenges. It expanded training in BSc Forestry and Agroforestry by establishing Campuses that evolved into Constituent Colleges and later Chartered Universities. University of Eldoret inherited the already existing Forestry, Wood Science and Agroforestry programmes of Moi University. The University of Kabianga and

University of Eldoret have been reviewing their curricula jointly to ensure international standards of mainstream forestry and agroforestry training are maintained and meet the country's and employers' expectations. The forestry curricula in University of Kabianga and University of Eldoret retain the backbone or traditional forestry courses while embracing emerging issues. Related to forestry and agroforestry, different curricula for environmental degree programmes have been developed by many other Universities in Kenya. In most institutions, environmental and forestry courses are housed and managed in different Schools / Faculties. At the University of Kabianga, they are managed under the same school to enhance multi-disciplinarity, maximize synergy of disciplines and optimize resources in delivery of the curricula.

Streamlining Forestry Training in Expanded University Education

During the period 2008-2016, University education in Kenya expanded to increase access to higher education and training of much needed skilled manpower to drive the national agenda of sustainable development and social wellbeing of citizenry. Environment and forestry are such universally well-known pillars of the above agenda. Environment, forests and trees outside forests are key ingredients for sustainable development and social well-being (UNASYLVA, 2015). There is a strong need for qualified and dedicated human resource to drive quality research and innovations to support knowledge-based policy making as well as management decision making to address emerging challenges of climate change and management of natural resources as well as persistent environmental degradation.

At present, Kenya has 70 chartered Universities and Constituent Colleges (33 public and 37 private) distributed across the Republic (KUCCPS, 2017). Most of the public Universities offer environmental and natural resource management courses but it is only University of Kabianga in Kericho County, University of Eldoret in Uasin Gishu County, South Eastern Kenya University in Kitui County, Maseno University in Kisumu County, Maasai Mara University in Narok County, Kenyatta University in Nairobi County, Karatina University in Nyeri County, and Egerton University in Nakuru County that offer full curricula of forestry and agroforestry programmes. No private institution so far has ventured into offering such courses that are labelled "unattractive" and require high capital for infrastructure and curriculum delivery.

Private Universities, driven by profit margins, shy away from these programmes that require heavy capital but attract low number of self-sponsored students.

From the list, a few of the newly established public Universities foresaw the need to strengthen this facet of social pillar of Vision 2030 by strategically launching curricula and training in forestry, agroforestry and other environmental courses.

Two questions are addressed in this paper: How meaningful is the expansion of Universities in Kenya on forestry, agro-forestry and environmental courses? and what capacity do newly established Universities have to offer such specialized courses

Conceptual framework and Study variables

The rate of University expansion in Kenya in the study period can be related to rate of growth of forestry and related courses. Two scenarios can count for this relationship. One could be as a result of former colleges that have had parent Universities offering these courses and had inherited such programmes. This is the case with University of Kabianga and Karatina University for example. The second case could be an influence of the geographical location of the University such as the version of the programme being offered at Maasai Mara which deals with forest resources and wildlife management; or the need for forestry intervention to address environmental situation such as the scenario of dry land forestry being emphasized in South Eastern Kenya University (SEKU) in Kitui. Increase in admission numbers can be attributed to increased numbers of student who qualify to join University and this can impact on enrolment. These may not however translate to popularising the programmes. It is opined that a wider geographical spread of Universities may popularize the programmes they offer and the specialization by Universities could strengthen training of human resource that would make a great impact in addressing specific challenges facing the society in the wider forestry, natural resources and environment sectors.

This study sought to examine University expansion in Kenya in relation to training in forestry and allied programmes. Statistics of students admitted by the Government into forestry and related programmes and the enrolment rates of the admitted students were used as a measure of popularity of these programmes over time, between 2004 and 2014 (before and after expansion of Universities). The impact of increasing number of Universities and that of diversifying

specializations on the admissions and actual enrolment in forestry and allied programmes were also evaluated.

Methodology

This paper is based on a self-assessment of five public Universities offering degrees in forestry, agro-forestry and allied environmental programmes in Kenya.

Sampled Universities

Five Kenyan Public Universities which offer forestry and related programmes were sampled to participate in this study but four provided feedback. These are University of Eldoret (UoE) and Moi University (MU) from Uasin Gishu County, University of Kabianga (UoK) from Kericho County, South Eastern Kenya University (SEKU) from Kitui County and Karatina University from Nyeri County.

Data collection

Data on chartered Universities and the clustering of Bachelors courses were obtained from Commission for University Education (CUE, 2017) and Kenya Universities and Colleges Central Placement Service (KUCCPS, 2017). Data on students' placements and reporting in courses under study were obtained from the four sampled Universities' records. Four informants from different institutions were provided with excel spreadsheet matrix online to fill in required details and to enable comparative quantitative data analysis. In addition an online questionnaire was designed and distributed for capturing qualitative information. The following 7 out of 13 academic years (54%) were sampled to generate time series data between 2004/2005 and 2015/2016: 2004/2005, 2006/2007, 2008/2009, 2010/2011, 2011/2012, 2012/2013, 2014/2015. Experts' views on challenges and opportunities in forestry education and training in Kenya were captured and documented.

Data analysis and interpretation

Geographical location of Universities was done using Google map and GIS software. The collation and analysis of information was done using simple statistical tools in MS Excel. Tabulated averages and percentage summaries as well as illustrations using bar charts and line

graphs were produced from MS Excel. To appreciate the rate of increase in admitted number of students as the number of Universities increased, we used the period when only one University offered Forestry programs as a bench mark. This initial period is from 2004 to 2007 when only Moi University (at former Chepkoilel Campus) was teaching Forestry and Wood Science degree programmes and thereafter in 2005 BSc Agroforestry. Regression analysis tool in SPSS was used to model the progressive increase of admitted students in forestry related programmes as the number of institutions offering those programmes increased. Based on feedback from informants, authors derived current needs that should be addressed by the Government and other stakeholders to enhance quality teaching.

Results and Discussion

Training in forestry and environmental courses in Expanded University Education

There exists 70 Universities and Constituent Colleges among which 36 are public. Table 1 shows the distribution of public universities across the Kenyan territory and indicates where forestry, agroforestry and environmental courses are presently.

According to KUCCPS database, 55% of Public Universities in Kenya (18 out of 33) train in diverse environmental studies courses. Five (5) Public Universities out of the 36 offer forestry courses and two (2) Universities (University of Kabianga and University of Eldoret) offer BSc in Agroforestry and Rural Development. A few other Universities such as Maseno, Kenyatta and Egerton teach Agroforestry as subjects or options within wider the environmental or natural resource management programmes. Thirty (30) different names have been used to capture undergraduate degree programmes under the cluster of environmental sciences such as; Bachelor of Environmental Planning & Management, Bachelor of Environmental Studies and Bachelor of Science (Agroforestry & Rural Development) that are found at University of Kabianga.

Table 1

Distribution of Forestry and Environmental related courses across Public Universities* in Kenya (CUE, 2017; KUCCPS, 2017)

Public University	Offering Forestry	Offering Agroforestry & Rural Development	Offering Environmental courses
University Of Nairobi			
Kenyatta University			
Moi University			
Egerton University			
Jomo Kenyatta University of Agriculture and Technology			
Maseno University			
Masinde Murilo University Of Science & Technology			
Technical University Of Kenya			
Technical University Of Mombasa			
Dedan Kimathi University Of Technology			
Pwani University			
Chuka University			
Kisii University			
Maasai Mara University			
Meru University Of Science And Technology			
South Eastern Kenya University			
Jaramogi Oginga Odinga University Of Science And Technology			
University Of Kabianga			
Multimedia University Of Kenya			
Laikipia University			
Karatina University			
University Of Eldoret			
Kibabii University			
Taita Taveta University			
Muranga University of Technology			
Kirinyaga University			
Co-Operative University Of Kenya			
Garissa University College			
Rongo University			
Embu University			
Machakos University			
Kaimosi Friends University College			
Alupe University College			

***Accredited Universities in Kenya as at October 2016.**

Thirty eight (38) different names have been used by different Universities for courses falling under natural resources management cluster. This cluster includes Bachelor of Science (Environmental Conservation and Natural Resources Management), Bachelor of Science (Forestry), Bachelor of Science (Integrated Forest Resources Management) and Bachelor of Science in Forestry Ecosystem Management courses. It is observed that, within the same County, different Universities name closely related programmes differently which leads to the question of standardization and quality assurance. Why modification of names? To what extent does the content vary among close but distinctly named programmes? How does this translate into professionalism? There is need to ensure that each programme meets minimum requirements for a course in a given profession such as Forestry, Agroforestry, environmental planning, environmental conservation and environmental education among others. The task remains to determine who should set the standards and when.

Scaling up training in forestry and environmental courses in Kenya

Students' admissions

Level of placement of students increased as the Universities offering the courses increased as shown in Table 2. Statistics revealed that increasing the number of Universities / University Colleges offering forestry related programmes enhanced students' placement by Government by up to 133%. This sharp and progressive increase of nationwide admissions in relation to number of Universities follows a perfect third order polynomial function (cubic function) as shown in Figure 1.

$Y = 2x^3 - 23.5x^2 + 131.5x + 17$ ($R^2 = 1.0$, $p < 0.001$); where

Y= average number of students admitted by Government in forestry and related courses per year;

x = number of Universities / University colleges accredited to offer the same courses stated in Y.

Table 2

Students' *admissions into forestry and related courses between 2004 and 2014 in various Universities of Kenya*

Ac. Year	No. Univ.	Av.adm. /yr	%	% increase	Institutions
2004-2007	1	127	100		Moi University
2008-2009	2	202	159	59	UoE, UoK
2010-2011	3	254	200	100	UoE, UoK, SEKU
2011-2014	4	295	232	132	UoE, UoK, SEKU, Karatina University

Data on 2014/2015 were not reported. The percentage annual admissions across academic years were calculated using 2004- 2007 Academic Year average as the baseline record (denominator). Increment in percent for a given period was done with reference to the average of the period when one institution was offering forestry related programmes. For example, 100 x [annual average value of 2008-2009 Academic years (202) - annual average value of 2004-2007 Academic years (127)] divided by baseline record (127) equals 59%.

The chart shows the equation $y = 2x^3 - 23.5x^2 + 131.5x + 17$ and $R^2 = 1$.

Axis labels: "Average no. of admitted students per year in the country" (y-axis) and "No. of universities offering forestry related programmes" (x-axis).
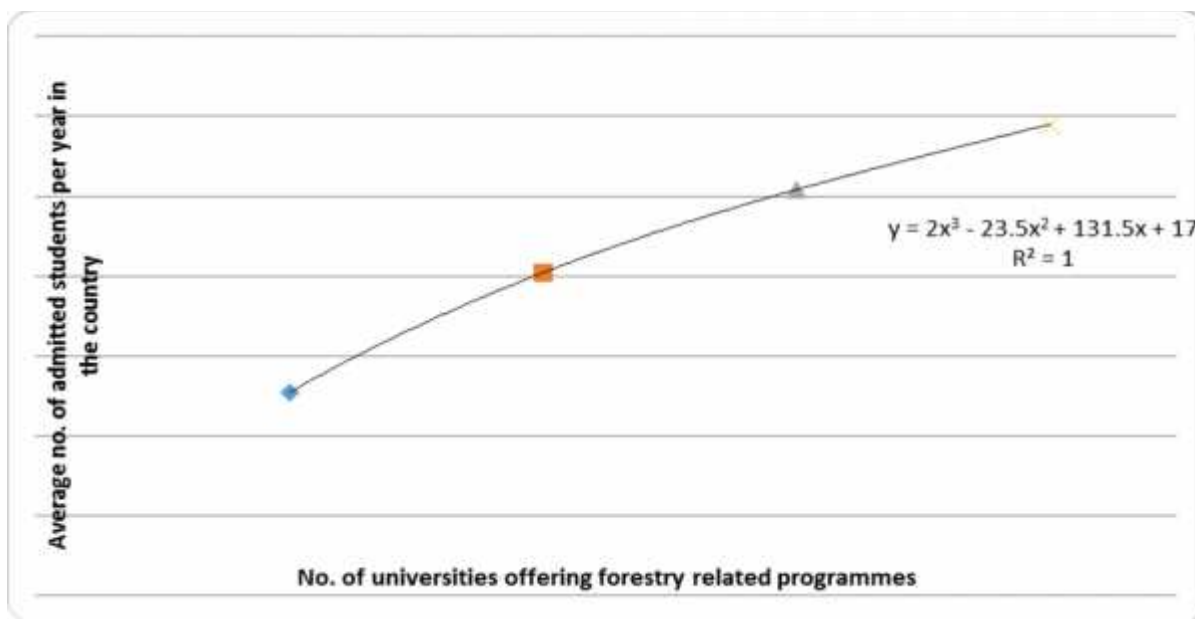
Figure 1. Trend of students admitted by the Government in Forestry and related degree programmes

Students' enrolment from 2004 to 2014

The percentages of those who enrolled (reported) out of those admitted in various Universities for forestry and related courses are generally lower than 50 % as shown in Figure 2. It was noted that students' placements (admissions) did not necessarily translate into actual number of students registered or enrolled into the course; some students transferred into other programmes on reporting while others did not report at all into the programmes they were admitted in.
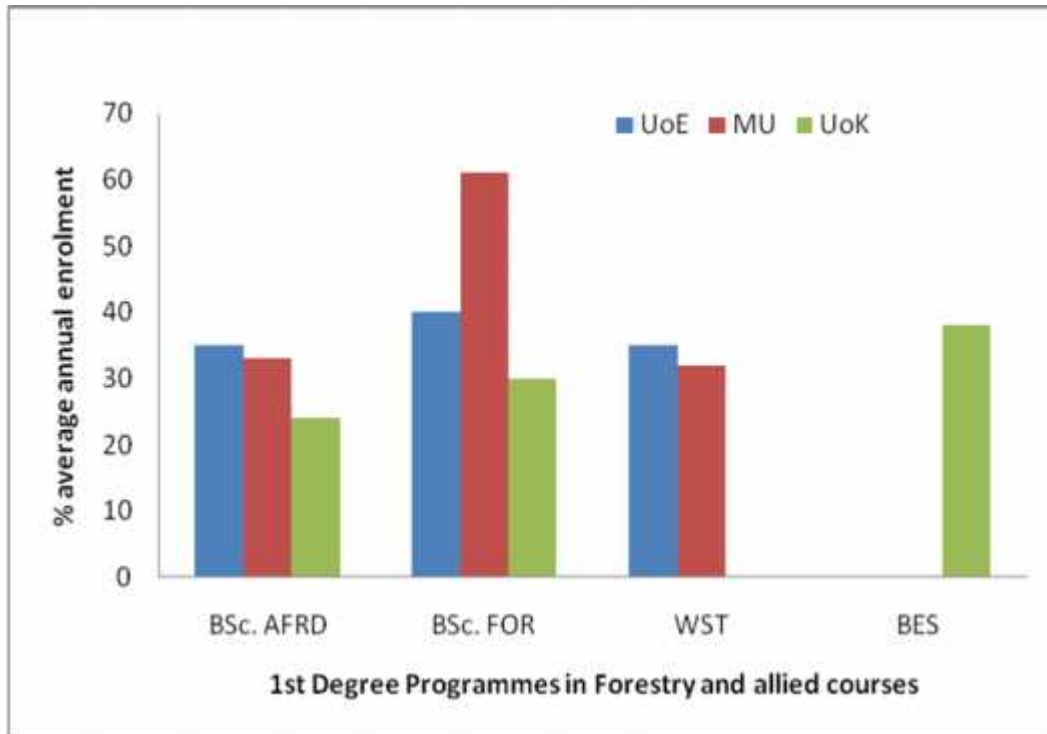

Figure 2. Enrolment rates in Agroforestry and Rural Development (AFRD), Forestry (FOR), Wood Science and Technology (WST) and Bachelor of Environmental Studies (BES) across Moi University (MU), University of Eldoret (UoE), University of Kabianga (UoK) from 2004 to 2014

Forestry in Kenya was more accepted before 2010 (Moi University with mean 61% turn up) than it is today (less than 50 % in University of Kabianga and University of Eldoret). Unlike at the University of Kabianga (started: 2011), programmes offered at Moi University (started: 1984) and University of Eldoret (started: 1990) have been in existence for long. Rate of enrolment at University of Kabianga is expected to increase as the University gets more and more known and popular. The overall declining rate of uptake of forestry related courses is neither recent nor unique to Kenya. Similar scenario was globally reported in an international workshop on forestry

education that was held in 2007 (Temu and Ogweno, 2008). Nyland (2008) also reported the decline in forestry education enrolment in North America. Several factors contribute to the decline including emergence of more lucrative and descent jobs. Challenges facing forestry training then remain nearly the same today, a decade later. Concerted efforts are still needed to motivate young generations to value and join nature-based professions and also to re-focus training curricula to embrace emerging and attractive technologies such ICT.

Matching admissions and enrolment rates in declaring capacity

Based on past records, experiences and statistics, there emerges a strategy to enhance class attendance in forestry and related courses. Figure 3 shows how class sizes in BSc Forestry, BSc Agroforestry and Rural Development and Bachelor of Environmental Studies at University of Kabianga (UoK) are nearly balanced (average class size of 20) by strategically managing the enrolment rates and number of students admitted into the various programmes. Declared capacity gives room (allowance) to those who might not take up the courses they are called for. For example, Agroforestry and Rural Development is given highest admission number because it has the lowest rate of enrolment. Having established the trend, the size of the class can now be envisaged to increase across the board by enhancing marketing of the programmes, increasing number of admitted students and or combining both strategies. Moi University (MU) no longer offers the courses being analysed having passed them over to various new Universities it nurtured.

The trend at University of Eldoret (UoE) shows Wood Science and Technology (now named Wood Science and Industrial processes) as the most disadvantaged programme in students' enrolment. This programme is critical in promoting wood-based industries and is only offered at University of Eldoret. There is need to enhance the student numbers, by applying similar strategy as used in University of Kabianga. Also we note that Agroforestry and Rural Development is a relatively new discipline being offered only in University of Kabianga and University of Eldoret. There is need to endeavour in promoting the same in both institutions by increasing the numbers and capitation for the same. Agroforestry professionals are being channeled out to be leaders in driving the development of technologies to enhance tree cover and tree resources on farm and

other landscapes outside forests for sustainable conservation of agro and pastoral ecosystems while improving livelihoods of same land owners through multiple tree products and services.
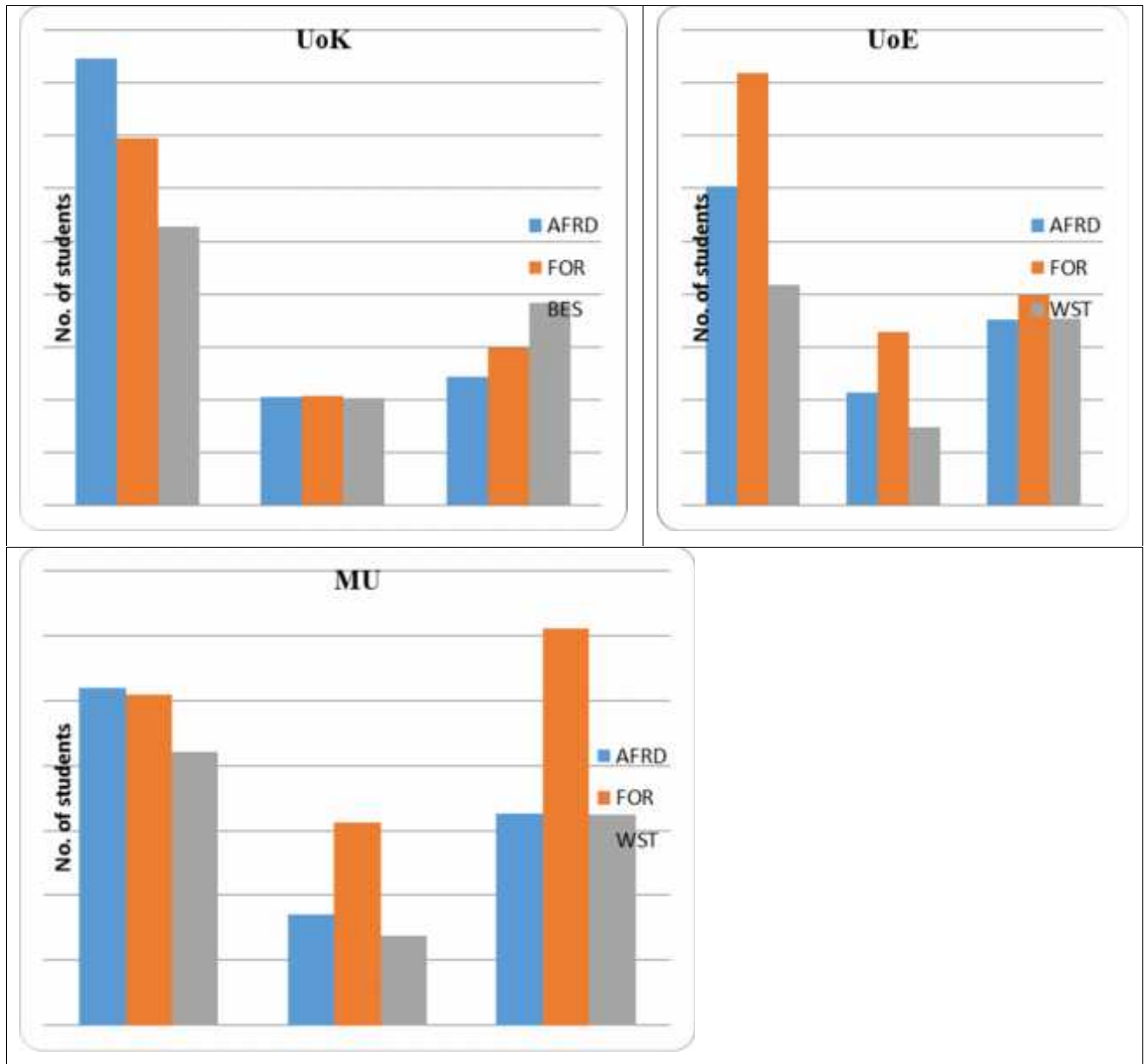

Figure 3. Average annual admissions and enrolment in Forestry & Environmental Courses between 2012 and 2014 (UoK, UoE and MU)

Impact of Diversifying Programs on Admissions and Enrolment

Results of this study revealed that institutions with more diversified programmes related to forestry have more admissions and enrolments in the same areas of specialization combined (Appendix 1). Correlation between the average number of students admitted and enrolled annually in forestry and related programmes and the number of forestry and related programs was positive, very high and significant (Figure 4).
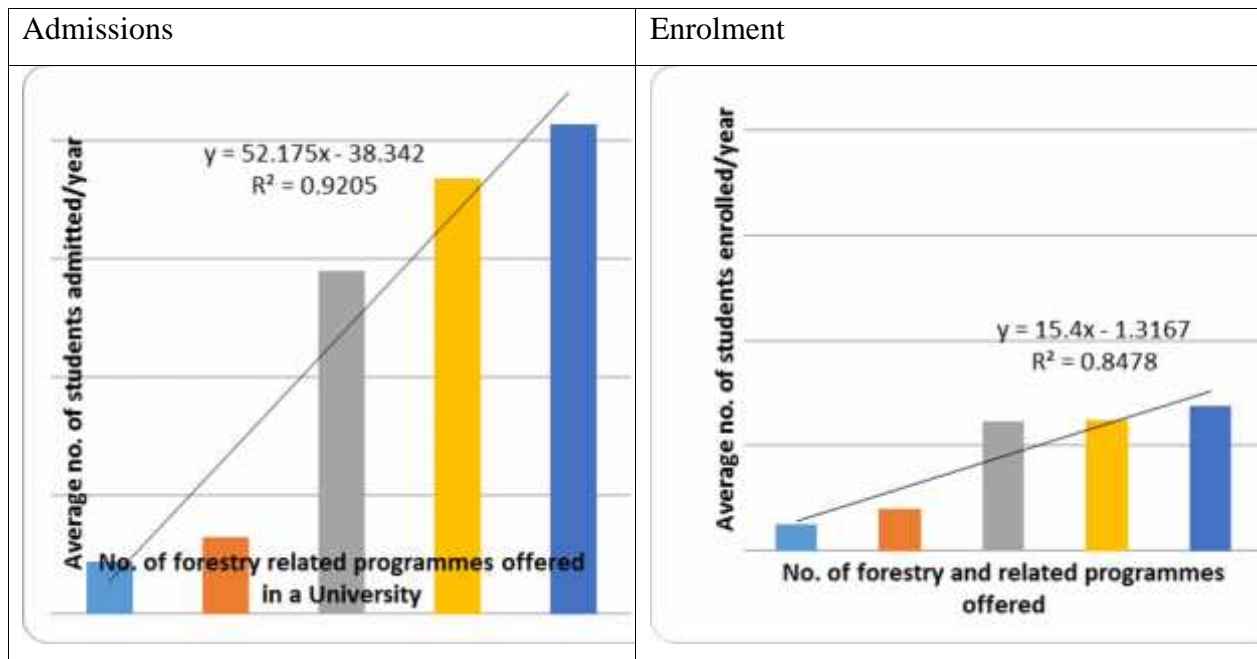
Admissions	Enrolment

Figure 4. Correlation between the average number of students <u>admitted</u> and <u>enrolled</u> annually in forestry programs and the number of forestry and related programs in Kenya (n = 4 Universities).

On whether institutions should duplicate or diversify Forestry Curricula, there is a view that it would be good to diversify so that each University builds on its strength and be recognized as a centre of excellence for the same. Harmonization (duplication) of curricula has shown a weakness of having staff moving away at the least frustration and some students opting to stay around their homes, hence compromising the universality of the University institutions. It would perhaps be efficient to put in place a system of coordination of programmes in the country to ensure that each University becomes a known centre of excellence in specialized areas of forestry as opposed to one general degree course. Each institution could offer forestry degrees with different emphasis such as B.Sc. in Forestry (Community Forestry), BSc in Forestry (Agroforestry and Rural Development), BSc in Forestry (Industrial Forestry), BSc in Forestry (Environmental Forestry), BSc Forestry (Conservation Forestry), BSc (Urban Forestry) etc.

This rebranding could enhance popularity and relevance of the courses, professionalism and perhaps create more opportunities for foresters in the currently diverse job market. Environmental studies in Kenya have already embraced this diversification with several options on offer.

Forestry education challenges in Kenyan Universities

Inadequate facilities

The level of students' exposure to practical skills is good in the Curriculum but problems of facilities often play havoc to the good intentions. There was common expression about the lack of model forests in forestry training institutions, lack of adequate laboratory and field equipment among others. There is need for enhanced practical training and research skills to back up adequately articulated content in curricula. Funding is required for specialized laboratories (GIS, Studio labs, Green houses, and Seed technology) and field teaching facilities as well as adequate means of transport for field visits.

Staffing

Currently staff development scheme in sampled Universities is weak, and in some lacking. The ratio of external lecturers to internal lecturers is very high. The country is experiencing scarcity of expertise in many specialized fields of forestry that include Forest engineering, forest harvesting, Silviculture, Dendrology, Forest policy and law, Forest economics, Forest mensuration, Forest inventory, Forest entomology, Forest pathology, forest fire management as well as in environmental planning and management. There is need for Universities and the country as a whole to seek strategic partnerships to support postgraduate (Masters and PhD) curricula development and training of faculty in these fields.

Public Perception of lack of job opportunities

Environment and allied sectors are no longer employing their graduates in this era when food shortages, climate change and water scarcity are real and threatening humanity. Public perception of lack of job opportunities in the sector would be changed by taking specific measures towards promoting forestry and related courses in primary and secondary education as well as a profession. The deliberate engagement of University graduates across all sectors to

provide leadership in solving current and real forestry, environmental and natural resources management problems would see more people pursuing these "neglected" careers to University level. There is need to enhance incentives to promote not only the practice of forestry but also and foremost to motivate the youth in schools to purposively choose forestry and related disciplines as a career of their choice. There is also need to back the rich theories in curricula with relevant practical technological skills to increase returns in forestry and environmental management by enhancing the multipurpose of forest systems.

Opportunities to promote Forestry popularity and related disciplines in Education

Forestry is a specialized field of study with unique career opportunities. The following interventions have been identified as avenues towards the promotion of forestry education popularity in Kenya and are in concurrence with the National Forest Policy (Republic of Kenya, 2014):

i. Expanding the modern communication system up to including rural areas where most foresters operate in forest stations;

ii. Creating incentives for production and performance by innovating a diversity of a rewarding system in the sector such as increasing chances for upward mobility;

iii. Sealing corruption loopholes in the practice of the profession;

iv. Creating opportunities for long and open distance learning;

v. Review curricula to reflect the broad nature of forestry, to capture all the emerging issues and provide specialization options;

vi. Support infrastructural development to enhance learning, that is, invest more in forestry education;

vii. Regulate and standardize the forestry curricula by setting some minimum requirements in content while removing a lot of duplication of curricula and increasing diversity of specializations which address the real challenges of the 21st century and embrace use of ICT;

viii. Maintain healthy and vibrant linkages between institutions such as inter-Universities linkages; researchers- Kenya Forest Service –Universities linkages, linkages between Universities, industries and professional bodies and

ix.　Increase awareness through outreach activities by concerted efforts from all stakeholders; increase engagement of graduates to tackle emerging issues of environmental concerns through internships, volunteer programmes and conventional jobs and Pooling scarce resources together: innovative teaching models, co-researching.

Conclusion

The study revealed a positive strong correlation between increasing the number of Universities training in forestry and related programmes on the levels of students admissions and the rate of enrolment in Kenya. Diversification of programmes within any given University also indicated positive effect on levels of students' admissions and enrolment rates. The identified forestry education challenges in Kenyan Universities include low staffing, lack of adequate resources for staff development and inadequate facilities, few institutions offering forestry related courses, low enrolment of students, inadequate infrastructural development and learning facilities, rare internship opportunities to motivate young graduates. This study identified the following as opportunities towards promoting forestry and related disciplines in Kenya:

i) Raising its popularity among primary and secondary schools, parents and the public at large;

ii) Promoting and rewarding professionalism, innovative ways and means of curriculum delivery;

iii) Support for infrastructural development to enhance quality learning;

iv) Regulating and standardizing forestry and related curricula by setting minimum requirements for prerequisites and required professional subjects in curriculum content while promoting diversity of specializations which address the real challenges of the 21st century and embrace use of ICT and

v) Maintaining vibrant linkages between Universities, industries and other stakeholders.

This study recommends that there should be:

i) National rebranding of curricula for BSc training in forestry and related environmental courses to create and support centres of excellence, enhance more diverse (specializations) of programmes to create more opportunities for professionals and satisfy the demands for competent experts on the job markets, locally and internationally;

ii) Internal and external institutional support for infrastructural development including learning facilities; equipped laboratories, field equipment and model tree nurseries. Deliberate action to enhance ex-chequer capitation for young institutions to support academic and research infrastructure and

iii) Motivation of professionals in forestry and related disciplines through provision of internship opportunities to young graduates, and continual improvement of working conditions. Future studies to look at the rate of completion and placements of graduates in the various job market outlets are also recommended.

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Appendix 1

The change in average number of students admitted or enrolled per year as the number of Forestry and related programmes changes

Admissions

Programmes / Options	Mean number of students admitted per year per institution				
	UoK	UoE	MU	Karatina	SEKU
BSc. Agroforestry & Rural Development	84.8	60.5	52.0		
BSc. Forestry	69.5	82.0	51.0	22.0	32.5
B. Environmental Studies	52.8				
BSc. Wood Science and Technology		41.8	42.2		
Total No. students per year	**207.0**	**184.3**	**145.2**	**22.0**	**32.5**
No. of options /Programmes	**3**	**3**	**3**	**1**	**1**

Enrolled

Programmes / Options	Mean number of students enrolled per year per institution				
	UoK	UoE	MU	Karatina	SEKU
BSc. Agroforestry & Rural Development	20.5	21.2	17.0		
BSc. Forestry	20.8	32.7	31.2	19.7	12.8
B. Environmental Studies	20.2				
BSc. Wood Science and Technology		14.8	13.7		
Total No. students per year	**61.5**	**68.7**	**61.9**	**19.7**	**12.8**
No. of options /Programmes	**3**	**3**	**3**	**1**	**1**

Knowledge and Attitude of Secondary School Students and Other Stake-Holders about TVET
Dr. Arun Datta

Abstract

Kenya envisions to become an industrialized nation by 2030. Besides the entrepreneur, the human input for industry is in the form of management and skilled workforce. Technical and Vocational Education and Training (TVET) is geared towards that. National policies and Visions can be achieved if the population concerned, comprehends and is willing to work in that direction. In the case of tertiary (higher) education, it is the school leavers who should understand what TVET stands for and be willing to pursue it. A brief survey was conducted in April, 2015, involving a few secondary school students, teachers, Parent- Teacher Association (PTA) and Board of Governors (BOG) members. Most of the parents, PTA and BOG members were aware of TVET and associated it with easy employability. However, they felt that such jobs are low and don't pay well. The general impression was that TVET programs are for those who don't do well in Kenya Certificate of Secondary Education (KCSE). The students were found to be completely confused and even ignorant, even if some of them had vocational guidance. A degree qualification is seen as prestigious, well-paying and desirous. Most students have vague, wrong or no knowledge about what TVET entails. They want to become professionals and a degree is the only, certain way. It was concluded that there is a strong need to make school leavers aware of the options and to portray TVET in a positive light. If the TVET institutions can attract students with analytical abilities, they can fulfill their mandate better and the National goals can be achieved.

Introduction

Besides the entrepreneur, the human input for industry is in the form of management and skilled workforce, at different skill-levels. The dictionary defines skill as *an ability to do something well, especially because you have learnt and practiced it.* There is requirement of people with a variety of skills, with ability to do; *hands-on,* and do it well. I stress on 'doing well' because the world is competitive and very small. The competitive edge favors the countries whose labors'

skills can compete internationally. Not only compete but also innovate. It is because the world is changing fast. On one side the technology, which produces goods and on the other side the needs, fashions and tastes of people who consume them. In situations where *change* is the only *constant,* innovation carries the day.

Education, in itself is good to have. But if it is aimed at personal or national goals, just *any* is not good enough. The nation, parents and community invest in a young person; they are the stakeholders, whose interests should be kept in mind. Of-course the person's own interests, ambitions and capabilities are primary.

It is the national policies that determine the possible future demand for specific skills. It is also the national ambitions that shape the type of education provided by the educational institutions. National policies and Visions can be achieved if the population concerned comprehends and is willing to work in that direction. In the case of tertiary education, it is the secondary school leavers. Kenya's Vision 2030 demands a large number of technologists and technicians with innovative capabilities. There are many Technical and Vocational Education and Training (TVET) institutions for that purpose. Technical University of Kenya (TUK) is one of the leading providers of TVET education. To fulfill its mandate in line with national goals, it must attract the bright school leavers with analytical abilities and potential for innovations.

There is need to find out what the school leavers know about TVET programs and their attitudes towards technical vs. degree courses. There is also need for a wholesome survey to assess the extent to which all the stakeholders comprehend TVET programs, their relevance to the job market and the overall National goals.

Literature Review

A World Bank Policy Paper was published in 1991. It studied the subject of TVET and its impact on productive employment. It stressed the need to reform the public TVET systems. It was noted that in Africa, there is low economic growth, high population and expansion of labor force. Substantial investment had been made in coming up with data from thematic and country case-studies. Such studies are conducted by UNESCO, International Institute of Educational Planning,

ILO and its International Training Centre, the German Adult Education association and the National Institute of Technology in Oslo, Norway.

The areas covered by such studies include the role of training when there is not enough employment. They question the importance of training within the enterprises and the need for states to intervene. It is estimated that there are 7 to 10 million new entrants in the labor market in Africa. This is inclusive of the large number of school-leavers. Eighty-five percent (85%) of these new-comers are absorbed by the informal sector. Unfortunately most of the public universities do not keep pace with the economic and social needs. Moreover the certification agencies are quite rigid making curriculum development difficult.

The studies stress the need to improve public information about training systems. However there is no study done to assess the current state and level of knowledge that the school-leavers, their parents, teachers or their advisors have on TVET programs, in Kenya. This study is the first of the type to provide data on such knowledge.

Hypothesis

The hypothesis involves four different groups:

NATION: It requires manpower which can help achieve industrialization. Vision 2030 can materialize into reality by TVET programs.

COMMUNITY: A young skilled person who is conversant with local language, customs, values and aspirations is a dream of every community. They are the link between modern, "hands on" technology and the real society.

FAMILY: Majority of Kenyans are financially challenged, although a middle class is emerging, it is an effort for a family to provide for tertiary education. Even if tuition is provided by the Government, there are many expenses involved. A tertiary program that is just long enough to make one economically independent without compromising future academic growth is ideal.

THE CANDIDATE: A majority of them are not aware of all of their options. Entering a university is considered an accomplishment in itself. A good KCSE grade decides for them. The assumption is that a university degree automatically translates into a life of luxury. They don't fully comprehend the relationship between education, training and wealth-creation.

Justification for Research

Kenya's vision is to be a middle income country by the year 2030. To achieve this vision, the country requires skilled personnel to run the industries. According to African Development Bank's Country Strategy Paper, 2014 – 2018, Kenya has an estimated gap of approximately 30,000 engineers, 90,000 technicians and 400,000 artisans. For one to become a technician or an artisan, they have to go through middle level colleges or technical universities. The capacity of the over 50 middle level colleges that offer diploma programs is about 44,828 students. However, according to KUCCPS, only 11,523 students this year indicated to join these colleges. There seems to be a strong pursuit for university degrees at the expense of producing a workforce that will meet the needs and aspirations of the country.

The Kenya Engineering Registration Board estimates that for the country to attain the middle income status the ratio of engineers, technicians and artisans should be 1:12:60. Currently there is a huge gap as the ratio stands at 1:3:13 and TVET programs can play a big role in reducing the gap. The gap is too wide and needs narrowing down. This study seeks to investigate the knowledge of secondary school students and their attitudes towards TVET programs and also seek insights of the school heads, BOG and PTA members. The information will be useful in strategizing to create awareness of the TVET programs.

Indirect Benefits

A degree holder is analytical but has lesser 'hands-on' training and inclination. If the TVET institutions attract better (C+, B+, A) candidates, with analytical abilities, they will produce skilled diploma and B.Tech. holders who can reason and innovate. Better intake improves the quality of graduates. Such workforce can bring forth an industrialized Nation.

Way forward

After the hypothesis is confirmed, the students would be guided and counseled. The counseling and guidance message can be in the form of booklets and CDs for schools. Private sector partners can be found who can sponsor short films of the same for TV stations to air in public interest. For optimum impact, counseling and vocational guidance have to be backed by research.

Methodology

Study design

This was a cross-sectional study. In a cross-section study data was collected at one point in time from the individuals sampled. Contact with the study participants occurred only during data collection and the variables of interest were measured once at a specific point in time. In a relatively short duration of time, the design could be used to collect information from a large group.

Target population

The target population for the study was secondary school students, school heads, BOG members and PTA members. The secondary schools students were those in form three and form four. Any PTA and BOG member in each selected secondary school was included as a key informant in the survey although priority was given to the chairmen.

Study area

The study was conducted in secondary schools in Kenya.

Sample size

For the quantitative method the following formula has been used for sample size calculation:

$$n = \frac{Z^2 PQ}{d^2}$$

Where: n is the sample size; Z(1.96) is the standard normal deviation corresponding to 95% confidence interval; P is the proportion of secondary school students in Kenya with knowledge of TVET programs; Q= 1-P; d is the precision of the study (5%).

Since there is no similar study that have been conducted in Kenya p is unknown and therefore it is assumed that there exist equal chance of finding secondary school students with knowledge just as those who do not have knowledge of TVET program, hence p is 50%. Therefore:

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384$$

A sample size of 384 of secondary school students was used. For the qualitative method, one school head, one BOG member and one PTA member from each school was enrolled into the study. This means the total number of school heads, BOG and PTA members were nine.

Sampling technique

Multi-stage sampling has been used to select the secondary school students who participated in the survey. First, cluster sampling technique was used to select the secondary schools to participate in the survey. Then systematic sampling technique was used to select the secondary school students who participated in the survey. The sampling frame was the form three and form four students in the secondary schools and the class registers were used to determine the sampling interval. Purposive sampling was used for school heads, BOG member and PTA member selection.

Research instruments

The data collection tools used in this study, were a structured questionnaire and key informant interview (KII) guide (Appendix A). The structured questionnaire had questions on form three and form four students' knowledge and attitudes towards TVET. The KII had questions for the secondary school heads, BOG and PTA members.

Data collection

This study utilized mixed methods (both qualitative and quantitative) to assess the knowledge and attitudes of secondary school students and other stakeholders towards TVET programs in Kenya. In-depth interviews were used to collect the qualitative data. The quantitative data was collected through structured questionnaires.

Data processing and analysis

Quantitative data obtained was entered and analyzed using Statistical Package for Social Sciences (SPSS) software version 21. Bar graphs and frequency tables have been used to summarize the data. The qualitative data has been analyzed using Nvivo 10.

Ethical considerations

The names of the study participants will remain anonymous and have not been collected during data collection. Approval to conduct the survey was sought from NACOSTI, Ministry of Education and from the respective secondary schools administrations.

Results
Demographic characteristics of secondary school students

A total of 407 students from eight secondary schools filled the questionnaire (Figure 1). Majority 95.8% (n = 390) were form three students and a few (4.2%, n = 17) were form fours.
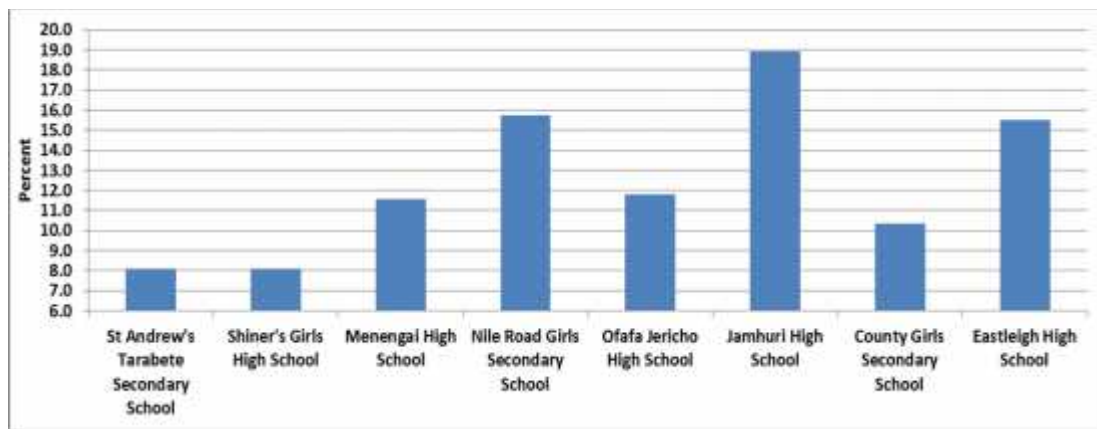

Figure 1. Secondary schools that participated in the study (n=407)

More male students (61.4%, n = 250) compared to females (38.6%, n = 157) participated in the study (Table 1). Slightly more than half (53.1%, n = 216) had 17, slightly below a third (30.2%, n = 123) had 18 and above, 16% (n = 65) had 16 while 0.7% (n = 3) had 15 years. Only 391 students indicated their religion. Most (59.6%, n = 233) were Protestant, 23.3% (n = 91) Catholics, 14.6% (n = 57) Muslims and others (2.6%, n = 10). A total of 381 students indicated the highest level of education of father and/or mother. Most (57.5%, n = 219) had either of the parent with tertiary level of education, a quarter (24.9%, n = 95) with secondary, 11% (n = 42) primary and a few 6.6% (n = 25) with none. A few 8.8% (n = 33) had family members enrolled in TVET while majority 91.2% (n = 343) did not. With regard to family monthly income half (49.9%, n = 176) of the respondents indicated more than 20000, 20.4% (n = 72) between 10000 and 20000, 15.9% (n = 56) between 5000 and 10000 while 13.9% (n = 49) had less than 5000 Kenyan Shillings.

Table 1a

Demographic characteristic of secondary school student

Characteristic	Frequency	Percent
Gender		
Male	250	61.4
Female	157	38.6
Total	**407**	**100**
Age		
15 Years	3	0.7
16 Years	65	16
17 Years	216	53.1
18 years and above	123	30.2
Total	**407**	**100**
Religion		
Protestant	233	59.6
Catholic	91	23.3
Muslim	57	14.6
Others	10	2.6
Total	**391**	**100**

Table 1b

Demographic characteristic of secondary school student

Characteristic	Frequency	Percent
Father's and/or mother's highest education		
None	25	6.6
Primary	42	11
Secondary	95	24.9
Tertiary	219	57.5
Total	**381**	**100**
Family member enrolment in TVET		
Yes	33	8.8
No	343	91.2
Total	**376**	**100**
Family monthly income		
Less than 5,000	49	13.9
5,000 - 10,000	56	15.9
10,001 – 20,000	72	20.4
20,000 and above	176	49.9
Total	**353**	**100**

Education pathway

Responses from the survey revealed that majority 86.7% (n = 353) of the respondents preferred joining University, 10.3% (n = 42) Technical College and 0.7% (n = 3) Vocational Centre after secondary education (Figure 2). Moreover, 31.7% (n = 129) indicated that other people affect their decision on the field to enrol and they include: family (52.7, n = 68), friends and neighbours (31%, n = 40), school (8.5%, n = 11) and others (7.8%, n = 10).
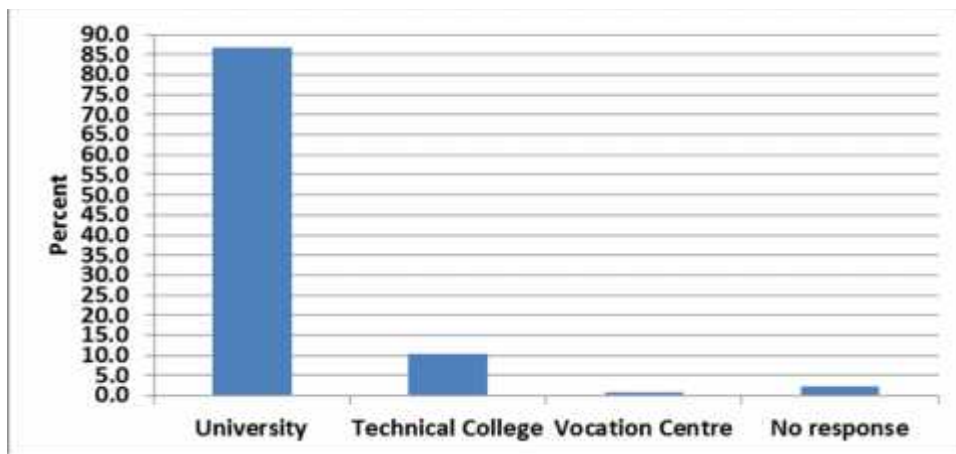

Figure 2. Desired institution to join after form four (n = 407)

Most (72%, n = 293) of the respondents indicated they were provided with guidance and counseling (Figure 3). According to the respondents career guidance and counseling was provided by parents (31.9%, n = 130), teachers (24.8%, n = 101), motivational speakers (3.4%, n = 14), pastors (1%, n = 4), mentors (1%, n = 4), friends (0.7%, n = 3) and others (12.6%, n = 37). However, only 19.1% (n = 56) indicated that the career guidance and counseling included TVET programs.
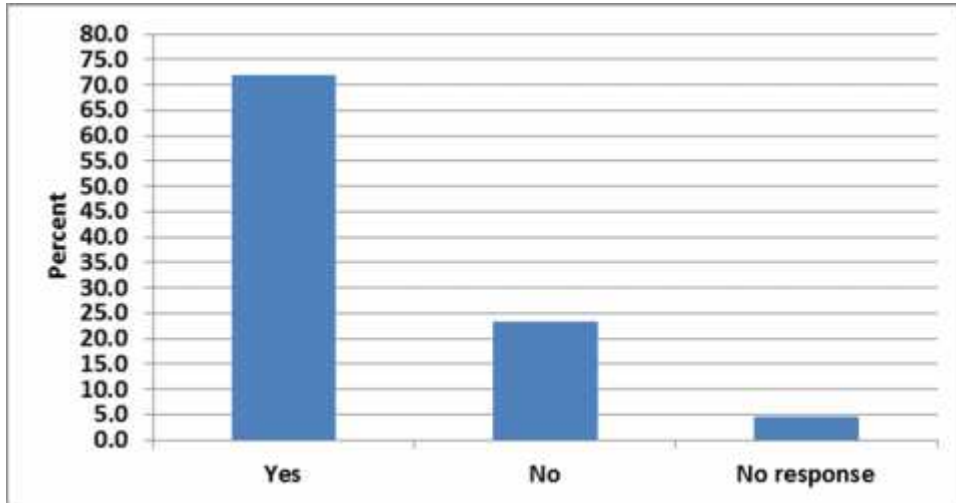
Figure 3. Provided with career guidance and counselling (n = 407)

Future career pathways of the respondents

Over half (55.6%, n = 219) of the respondents intend to have professional and private sector (17.5%, n = 69) careers in future (Figure 4). This is an indication of their preference to white-collar jobs which is not surprising considering 86.7% (n = 353) had intention of joining university.
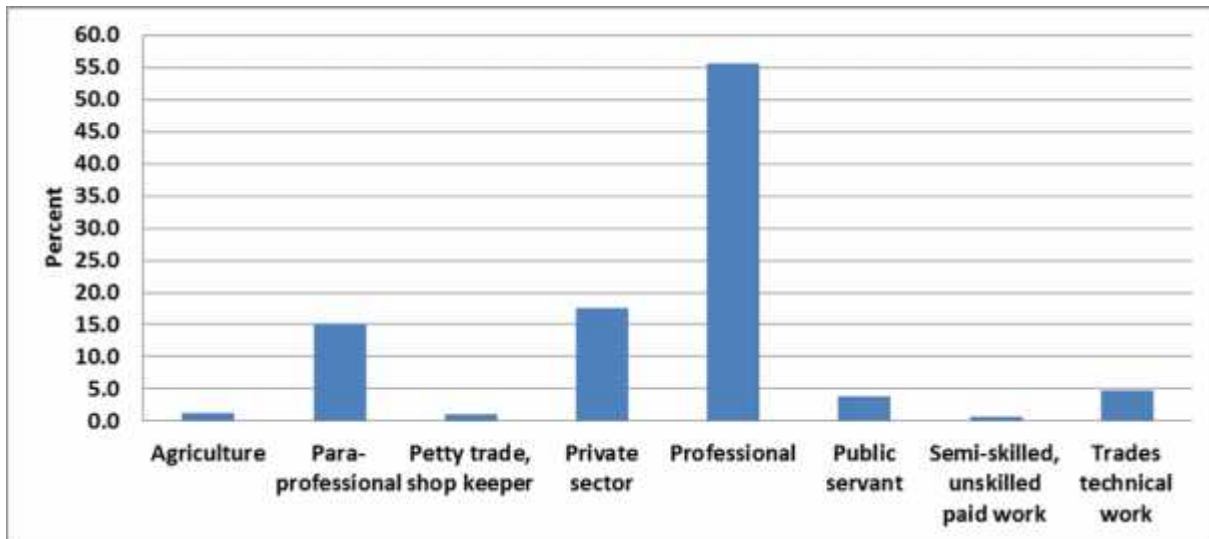

Figure 4. Dream job of the respondents (n=394)

Interestingly, only 15.2% (n = 60) of the respondents selected Para-professional careers in future. Most of the Para-professional jobs require technical skills that are acquired through TVET subjects. However, 70% (n = 42) of respondents that selected Para-professional career had no idea or had just heard about TVET with little knowledge of what it is all about (Figure 5).
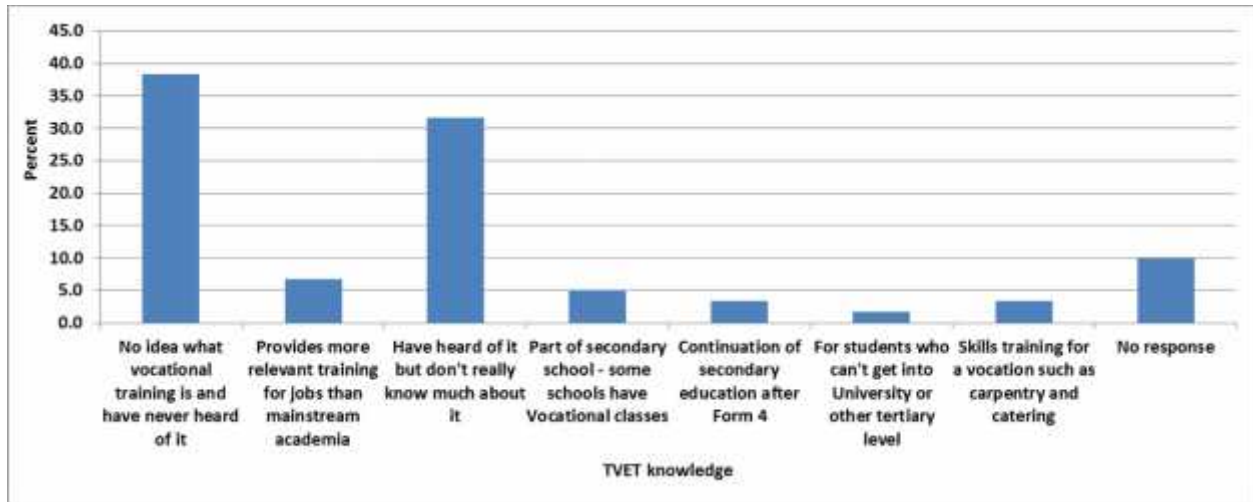

Figure 5. TVET knowledge distribution among respondents who selected Para-professional careers in future (n = 60)

Majority of the respondents had personal interest (69%, n = 281) and earning good income (11.8%, n = 48) as the motivation for chosen career (Figure 6).
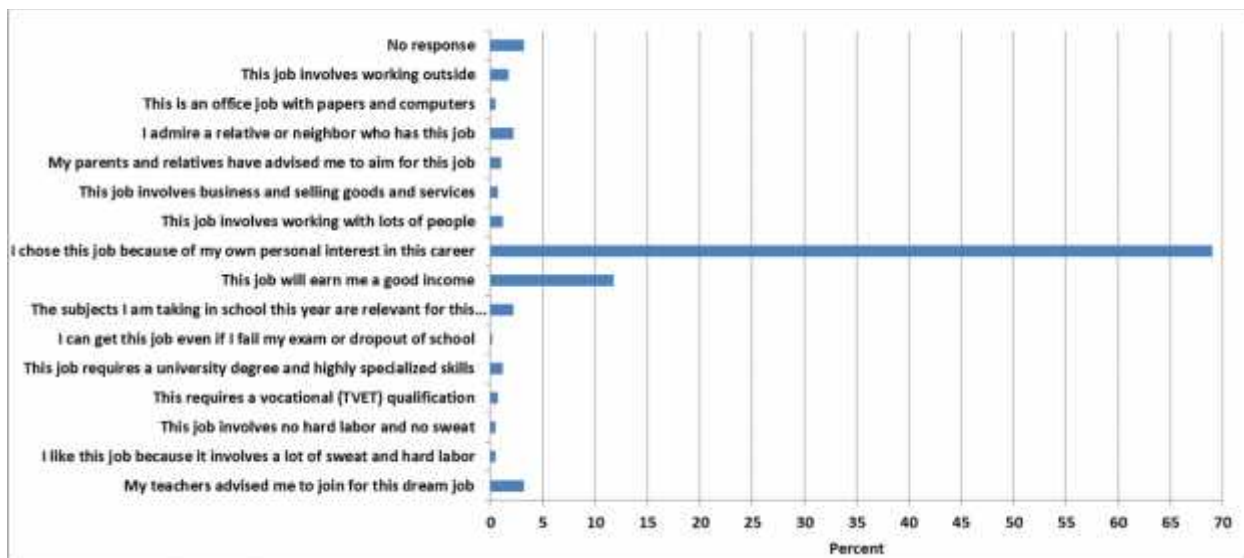
Figure 6. Reason for selected future career (n = 407)

TVET knowledge and awareness

Respondents were asked what they knew about TVET. About 42.8% (n = 174) indicated they had no idea and had never heard of it while a third (33.9%, n = 138) had heard about TVET but had little knowledge of it (Figure 7).
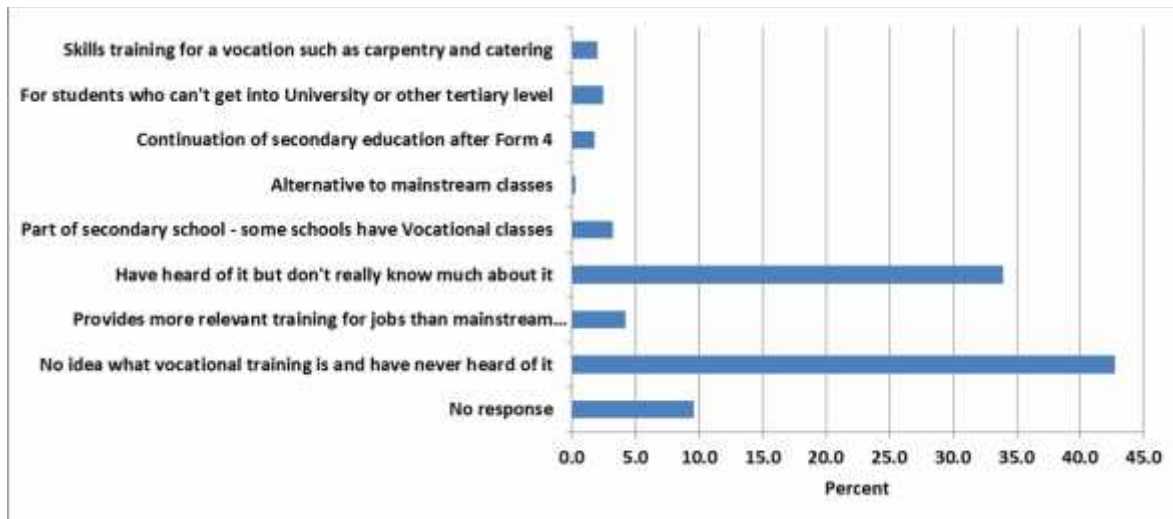
Figure 7. What respondents know about TVET (n = 407)

Respondents indicated that Technical Institutions (44.7%, n = 182) and Universities as where TVET courses are offered while 39.8% (n = 162) responded they don't know (Table 2). With regard to qualifications for one to join TVET courses only 17.7% (n = 72) indicted the correct response of 'C and above'. A high number of respondents indicated that TVET focuses on acquisition of employable (68.8%, n = 280) and practical skills (60.9%, n =248).

Table 2

Respondents' *knowledge on TVET*

Statement	Frequency	Percent
Where TVET courses are offered		
Universities	32	7.9
Technical Institutions	182	44.7
I don't know	162	39.8
No response	31	7.6
Qualifications for one to join TVET courses		
B+ and above	13	3.2
C and above	72	17.7
C and below	25	6.1
I don't know	267	65.6
No response	30	7.4
TVET curriculum focuses on acquisition of employable skills		
Yes	248	60.9
No	66	16.2
No response	93	22.9
TVET focuses on acquisition of practical skills		
Yes	280	68.8
No	37	9.1
No response	90	22.1
Total	**407**	**100**

After scoring the knowledge responses with a score range of 0 – 6, three-quarters (75.2%, n = 306) had poor knowledge, 15.5% (n = 63) fair knowledge while only 9.3% (n = 38) had good knowledge about TVET (Figure 8). The low knowledge may be attributed to lack of awareness on TVET as indicated by slightly more than half (52.3%, n = 213) of the respondents. That notwithstanding, 55.3% (n = 225) of the respondents expressed their desire to join TVET schools or centres.
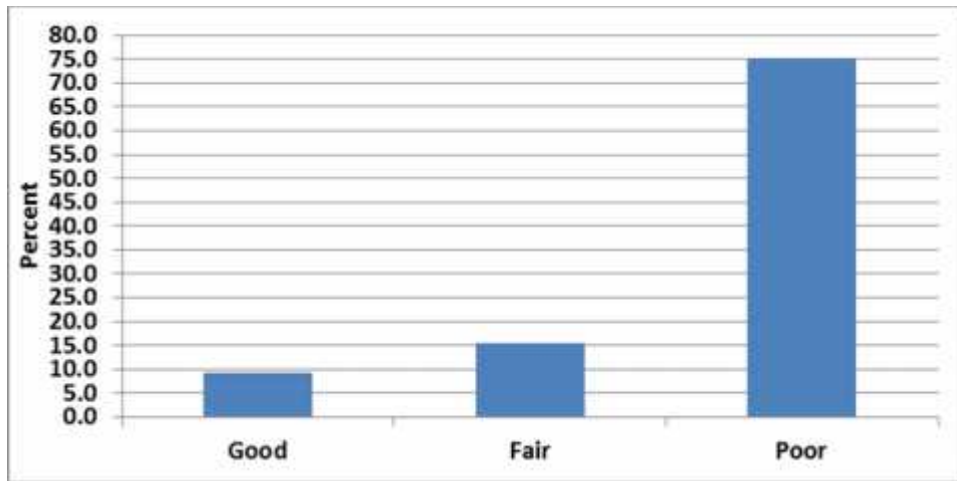
Figure 8. TVET knowledge score (n = 407)

Attitudes towards TVET

On a Likert scale respondents attitude towards TVET ranged from strongly disagree to strongly agree (Figures 9, 10 and 11). Only 348 (85.5%) responded to the attitude questions. A high proportion of the respondents were uncertain on hands-on approach (41.6%, n = 139) and high status (36.1%, n = 125) of TVET courses. Moreover a cumulative total of 56% (n = 191) of the respondents agreed and strongly agreed that academic courses have high status even though only 31.6% (n = 108) accumulatively agreed and strongly agreed that they are important than vocational. Responses from the survey revealed more than half of respondents accumulatively disagreed and strongly disagreed that people with degrees get the best jobs (53.4%, n = 186), make more money (53.6%, n = 183) and that TVET courses are difficult (60.4%, n = 204).

Figure 8. Attitude toward TVET (a)

With regard to higher recognition of university than TVET qualifications, a cumulative 56.2% (n = 199) either agreed or strongly agreed. The respondents think the s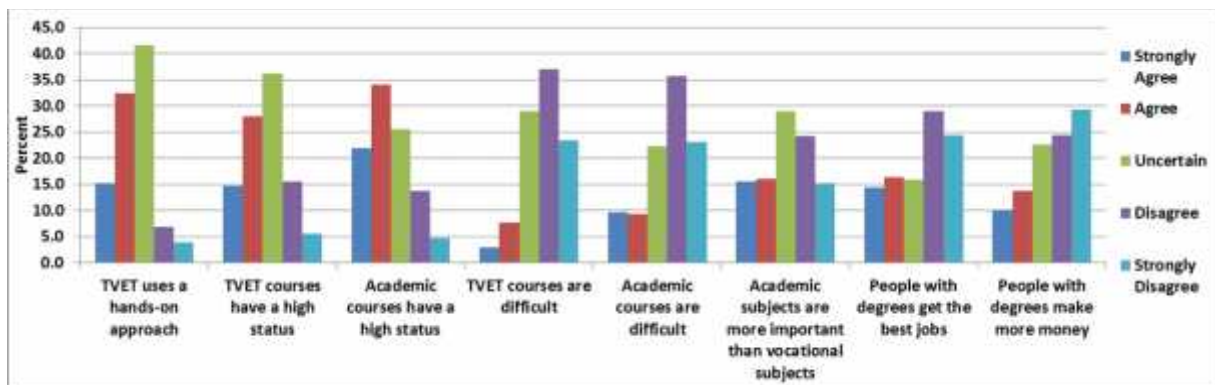ociety view those who pursue academic courses brighter than vocational. More respondents indicated agreed or strongly agreed that people think those pursuing degrees (48.1%, n = 172) are bright than those pursuing vocational course (18.6%, n = 65). About 34.7% (n = 120) agreed and 17.1% (n = 59) that TVET is an alternative for those unable to find a job while 29% (n = 102) agreed and 27% (n = 95) strongly agreed it is considered a second chance for those who want to further their education. More than half (56%, n = 195) strongly disagreed that TVET courses are designed to suit males and not females while 16.4% (n = 58) agreed and 21.5% (n = 76) strongly agreed that getting employed is more important that getting a degree.
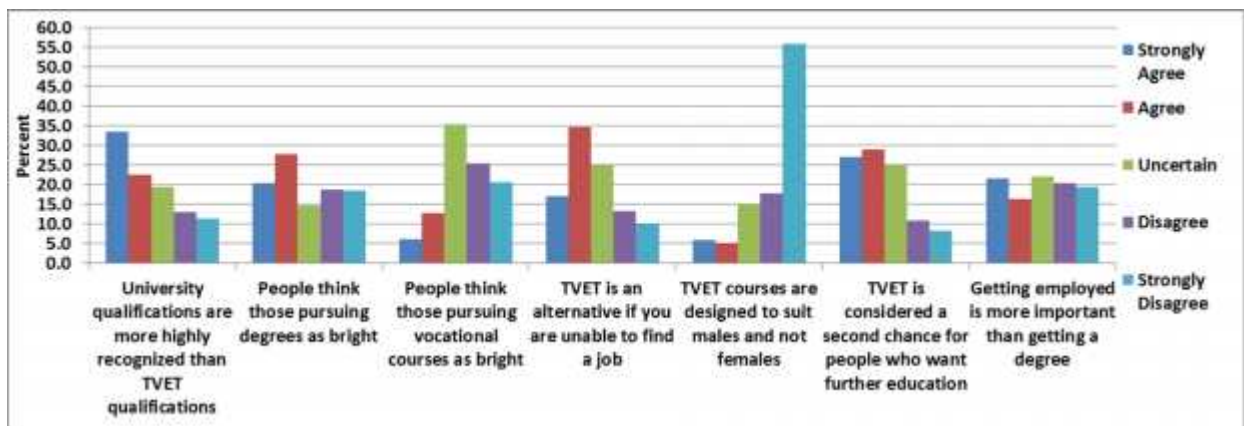
Figure 9. Attitude toward TVET (b)

Slightly more than a quarter (26.1%, n = 91) strongly agreed and a fifth (20.9%, n = 73) agreed that lack of highly-skilled technical manpower means poor infrastructure and institutions although 24.1% (n = 84) disagreed and 39% (n = 136) strongly disagreed that its shortage does not affect the economy. A higher proportion of the respondents were uncertain that there are more jobs available for TVET than degrees holders (39.3%, n = 134) and there are better self-employment opportunities for TVET graduates (37.9%, n = 130). Higher proportion (35.2%, n = 120) of the respondents agreed one can join degree program while a third (33.3%, n = 115) were uncertain whether lesser capital is required to start a business after TVET.
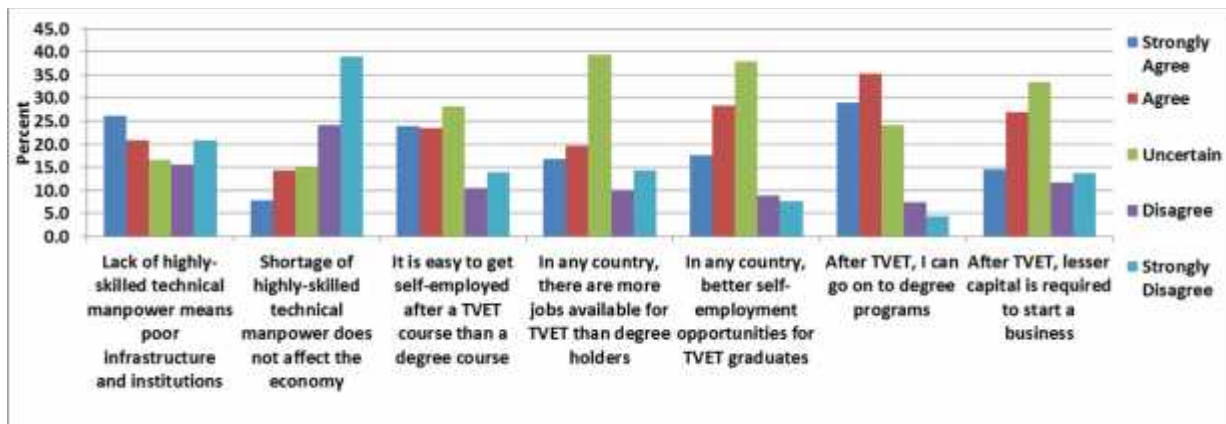
Figure 10. Attitude toward TVET (c)

The 23 attitude statements were scored with a score range of 0 – 92. A high proportion 57.2% (n = 199) of the respondents had fair attitudes, 40.8% (n = 142) had poor attitudes while 2% (n = 7) had good attitudes (Figure 11). This indicated that the respondents had negative attitudes towards TVET.
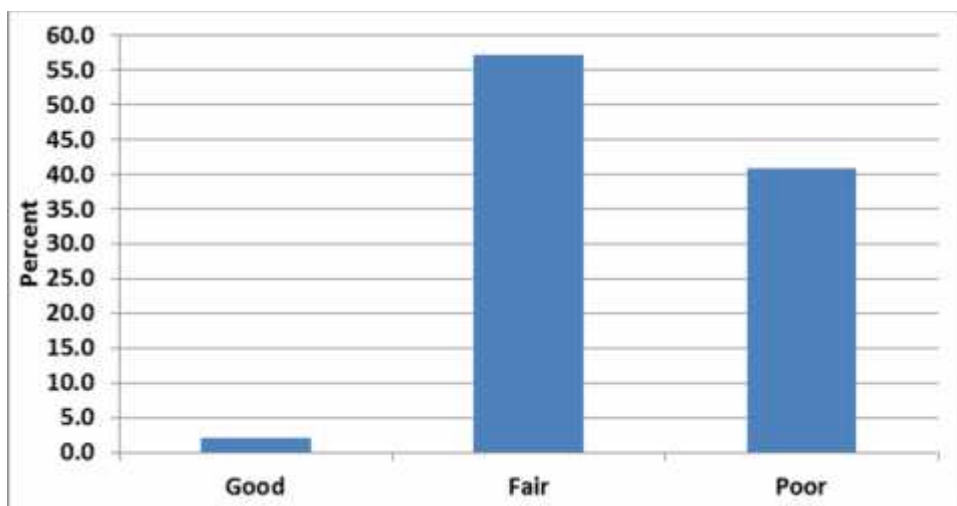
Figure 12. Attitude toward TVET scores (n = 348)

BOG and PTA members' knowledge and attitude towards TVET

Most of the parents, BOG and PTA members were familiar with TVET. Mr. Mwendwa, a BOG member described TVET as '*Hands-on experience, you know, education training that is hands on. Not theory, education ……..that is primarily practical as opposed to theory*'. They appreciated the role TVET played in providing youths with employable skills. They indicated

that the public has a negative attitude towards TVET since they preferred white collar jobs and associate TVET with odd jobs that are hard and dirty with low returns. A high number indicated that failures are the ones who join TVET centres and the decision to enroll is made by the student and the parent. The education system focuses more on those who join universities who are the minority and leave the majority to make their own career pathway. They indicated there is need to guide students into TVET programs to gain employable skills. They blamed the Government for not providing adequate resources to run TVET programs. They suggested that the curriculum should be revised to accommodate technical courses if Kenya is to achieve Vision 2030 besides establishment of more technical centres.

Teachers' knowledge and attitudes towards TVET

Teachers indicated that they don't have information to share with students on TVET. Despite display of information on TVET on careers day, very few show interest or interact with it, indicating that the students have a negative attitude towards TVET. They indicated that TVET could cater for those who fail to join university. According to secondary school principals and teachers the public has a positive attitude towards TVET but they lack information to guide the young students. It was indicated that there were no guidance and awareness programs to guide students into TVET at secondary school level. It was suggested that awareness on TVET should be created right from Form one, so that the students could make informed decision by the time they are through with secondary education.

Summary of Findings

The Form three and Form four students aged between 15 and 18 who were interviewed came from reasonably varied backgrounds. This was in terms of religious beliefs, economic strata, location and parents' educational levels. Some of them were from private schools but the majority were from public schools. Close to 90% of them wanted to join some University to pursue degree programs. Most of the respondents indicated that they were given career counseling. This was mostly from their parents. Over half wanted to have professional and private sector jobs. The 15% who showed interest in para-professional jobs, requiring technical skills, had little knowledge about TVET.

Most of the respondents claimed a personal interest in their choice of career, with almost no knowledge of the career path or qualifications required for it. A little explanation is provided by some of them saying that it is remuneration that guides their choice. Almost 50 % had never heard of TVET. Majority of those who had heard, had no idea of what it entails. Interestingly, many associated TVET with easy employability. However employability was not on their mind at all while answering the questionnaire.

In terms of attitude, high status was associated with degree course. TVET was seen either as lower or of unknown social standing. However, TVET was viewed as a second option in terms of jobs. Some of them were aware that skilled manpower is required for infrastructure development. Still, they could not associate it with opportunities. BOG and PTA members had mixed knowledge about TVET. They thought of TVET in terms of white or blue collar jobs only. The different cadres of technological personnel like artisans, technicians or technologists were the same for them. The head teachers or teachers, although aware, were not qualified enough to guide the students on the opportunities available. Most importantly, the attitude towards TVET is negative, inferior and 'menial'. It does not associate with creativity, innovation and pride. Most students did not show an eagerness to start earning and assisting their parents economically.

Hypothesis testing results

Candidates' actual responses matched with and validate, the hypothesis. PTA members represented the family in this brief survey. Their own knowledge seemed limited on this subject. Hypothesis about the economics of such education could not be established. BOG members represented the community. Again, their own views on TVET education were not grounded on knowledge and so, could not validate or otherwise, the hypothesis. There is need for a larger survey, particularly for other stake-holders than students, to establish the hypothesis. Under the heading of 'justification for research', the hypothesis about what the Nation needs, has been addressed.

Way forward

The sample size was rather small, considering the total number of secondary school-goers. However, from the responses received, it seems to be representative. It shows a sense of incoherence in the respondents' mind. They know that there is some correlation between education and economic returns and lifestyle. Surprisingly, there does exist some sort of career-guidance but it does not achieve its goals.

Despite the fact that a national goal or Vision exists, it has not rationally been translated into advice. The Nation wishes to be industrialized and the ratio of engineers to technologists and to technicians and artisans is proposed. It clearly demands a very large number of TVET graduates. This fact means a very high demand for such graduates and so employment opportunities. There is a mind-set that people in higher economic strata are white-collared only and that dignity is associated with them. Advertisements for luxury items and popular media strengthens such a view. The teenage mind gets influenced easily. In general, there is a lack of appreciation for honest, wholesome living with family, social and National values. Emphasis is on economic and not on holistic life. Teenagers are not motivated to help families or be patriotic. The way forward would include the following:

1. Inculcate a sense of patriotism. To understand, respect and follow national goals.
2. Give family values. Kenya is aspiring to be a middle-level economy. That means a majority of Kenyan house-holds are middle or low middle income level. Students should aspire for courses that are short (1 or 2 years), provide job opportunities so that they can support themselves, reduce burden on families and finance further studies. There is need to associate pride with being self-made and independent.
3. They should have pride in working with hands, be creative and innovative. There should be an eagerness to understand the workings and systems. The approach should be hands-on. Students should be encouraged to read success stories of entrepreneurs and inventors who excelled by such an approach.
4. Schools should have days set aside for teachers and parents to discuss career-routes available which are down to earth, available and achievable. Both the groups to be on the 'same page'.

5. The Government Ministries concerned, should produce spoken and visual material to be aired which advises the youth in an interesting way. For example, sports is intelligent, manual and physical activity; TVET programs prepare you for economic, intelligent, manual and physical activities; both can lead to success!

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Author's Profile

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Equity in Students' Enrolment in Public Universities in Kenya: An Analysis of Undergraduates with Disabilities

Dr. Beatrice Bunyasi Awori and Judith Chepkorir

Abstract

While access to higher education for the marginalized group is well established worldwide as a means to alleviating poverty towards an overall goal of achieving a sustainable society, equity in enrolment among students with disabilities in public universities is still a major challenge. This study examined equity in enrolment of students with disabilities (SWDs) in Kenyatta University and Maseno University. The study was limited to students with visual, hearing and physical disability. The study adopted a mixed method approach of enquiry and targeted all undergraduate SWDs (both regular and institutional-based) who were on session when data collection was being done in 2016. The target population was small and the study examined the entire target population of eighty two (82) students with disabilities comprising of seventy seven (77) regular students and fifteen (15) institutional based students. In order to address the research questions, quantitative data was collected using questionnaire and analyzed using descriptive statistics with the help of SPSS software. The findings revealed that there is a big discrepancy in enrolment per gender, programme of study, field of study and type of sponsorship. For instance, among SWDs who pursued the first degree, most of them at (68%) were self-sponsored while (32%) were direct entry students. In addition, majority of these learners at (50%) were registered in Education, while the remaining (17%) were registered in other courses. This findings point out the need to put in place explicit disability gender-based affirmative action which will encourage female SWDs to enroll in these institutions of higher learning.

Key words: Equity, Enrolment, Public Universities, Students with disabilities

Introduction

Access to higher education for the marginalized group is well established worldwide as a means to alleviating poverty towards an overall goal of achieving a sustainable society. Disability is recognized as one of the least visible yet most potent factors in educational marginalization (EFA Global Monitoring Report 2010). However, a dominant problem in the education of students with disabilities (SWDs) is that, despite the fact that most of them go through primary and secondary education, very limited number are included in higher institutions of learning (UNESCO, 2004).

As a result, disability having been identified as a disadvantaged equity group, there has been ongoing focus on increasing their access and retention to completion in post-secondary education both locally and internationally. Consequently most studies have attempted to identify the concerns of students with disabilities that challenge and jeopardize their retention in postsecondary education (The Youth Advisory committee of the National Council on Disability, 2003.

Most studies reveal that while the population of the general population of students in higher education has been on the rise, students with disability continue to be disadvantaged in terms of their access to and participation in these institutions of higher learning. A study by the National Center for Education Statistics, (2000) revealed that students with disability have a particularly low participation ratio of 0.48, with the participation ratio reflecting the share of places to estimate proportion of the population with students with disability represented 5.2 per cent of all domestic undergraduates, which is below the national reference target of their population share of 8 per cent. In terms of programmes of study, the study further established that only 15 per cent of people with disability have a bachelor degree or higher, compared to 26 per cent for individuals without disability. This exclusion per disability is also noted per gender. A study by OECD, (2003) indicates that disabled women and girls access to education is affected not only by their gender and disability, but also their type of disability among other factors.

The low enrolment rates of these learners may be attributed to several factors. This include curriculum barriers, which prevent them from attaining public university entry grade which forces them to enroll as parallel students, most of which they cannot afford as most of them come from poor economic background (Mugo et al., 2010). In addition, lack of adapted infrastructure in most public universities have prevented them from enrolling SWDs (Johnstone, 2004; Riddel et.al. (2005).

In Kenya, studies also reveal that participation of SWDs in higher education is very limited. A study by Wawire, (2008) established that inclusion of PWDs in six public universities in Kenya represented only 0.175% of the total university enrolments with the majority of this small population being included in only two public universities; Kenyatta University and Maseno University. In an attempt to curb these challenges, several affirmative action policies have been put in place. For instance, despite limited resources for public higher education, Governments and institutions developed a number of mechanisms to maintain access to higher education. Specific mechanisms include need-based scholarships and large-scale student loan programmes (Joshi, 2006). However, inadequate Government financial support to address the cost of higher education has exacerbated the exclusion of SWDs who lack finance to enroll to higher institutions of learning (Johnstone, 2004). As a result, there is need to lessen financial barriers to higher education participation for SWDs if sustainable society everywhere in the world is to be attained (Sawyer, 2002).

Statement of the Problem

Despite the fact that inclusion of SWDs spread over decades, their access, retention and completion in the mainstream higher institutions of learning is very limited. Out of about 115 million school-going population of SWDs world-wide, less than 40 million (35%) are included in higher institutions of learning. In Africa, out of the total 10% population of persons with disabilities, less than 1% is included in these institutions of higher learning, out of which the majority drop out during their first year (UNESCO, 2004). In Kenya, inclusion of SWDs in six public universities represents only 0.175% of the total university enrolments (Wawire, 2008).

While most of these studies focused on the general enrolment rates of students with disabilities, limited studies have examined the stratification in their enrolment per their demographic characteristics. In this paper, we examine equity in student's enrolment in Kenyatta University per demographic characteristics in Kenya. Using the variables of gender, mode of study, type of attendance, discipline of study, type of disability and field of study, we discuss how disability related limitations generate disadvantage and therefore a different experience in participation in higher education for students with disabilities.

Purpose of the Study

The purpose of this study was to establish equity in enrolment of students with visual, hearing and physical disabilities enrolled in Kenyatta University and Maseno University per demographic characteristics.

Objectives of the Study

i. Establish equity in enrolment of undergraduate students with disabilities per gender

ii. Establish equity in enrolment of undergraduate students with disabilities per field of study

iii. Establish equity in enrolment of undergraduate students with disabilities at per program of study

iv. Establish equity in enrolment of undergraduate students with disabilities at per type of sponsorship

Conceptual Framework

Independent Variables	Intervening Variables	Dependent Variable

▪ Gender ▪ Field of study ▪ Program of study ▪ Type of sponsorship	▪ Policy on inclusion ▪ Institutional responsiveness to inclusion	Enrolment of SWDs in Public University
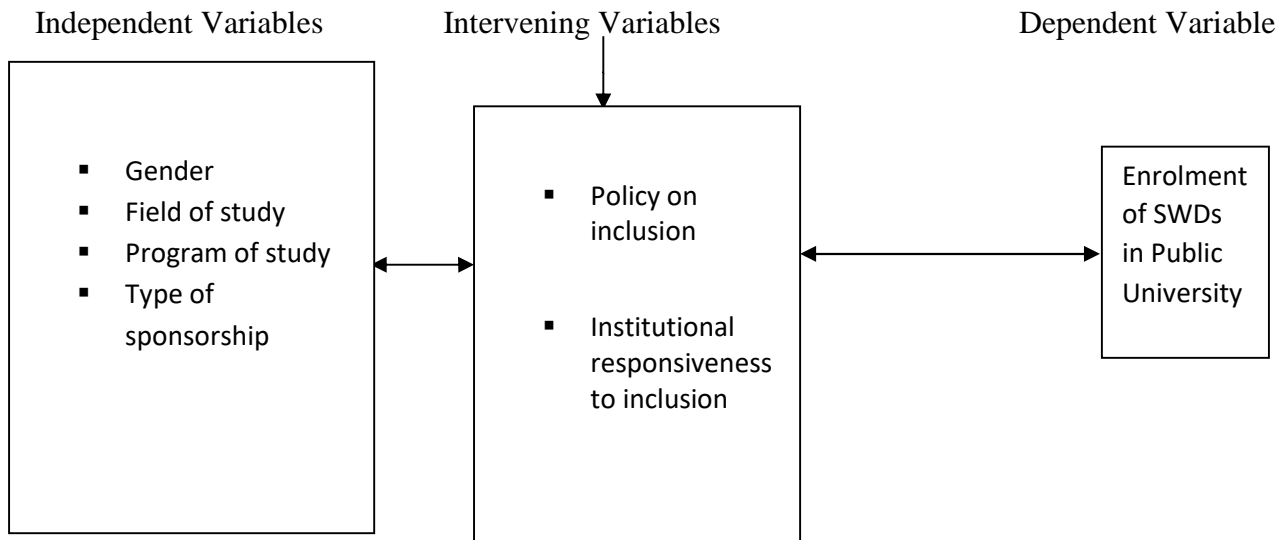
Figure 1. Equity in Enrolment of SWDs in Public universities in Kenya, 2016

Research Methodology

The study adopted a mixed method research design which employs both qualitative and quantitative methods. Qualitative method was used to collect data on regular and support services required for inclusion while quantitative method was used to collect data on cost of these requirements. This design was considered appropriate because it enabled the triangulation of results which ensured that the strengths of one method overcome the weaknesses of the other method thus strengthening quality and reliability of the findings.

Study Variables

The independent variables included the type of disability, regular and support provision, type of sponsorship and the amount of available financial support, the dependent variable was equity in enrolment of SWDs in public universities.

Location of the Study

The study was carried out at Kenyatta University main campus and Maseno University. Kenyatta University is located in Kahawa, about 23 Kilometers from Nairobi's City Centre, along the Nairobi-Thika road. This locale was selected purposively because it is the only public university

that integrates the highest number of SWDs into various degree programmes in Kenya. It is also the only university that has established a disability office known as KUDSO (Kenyatta University Disability Students Office) which is mainly concerned with the provision and other affairs of SWDs in the university. Maseno University is located in Kisumu County, approximately 5 km from Kisumu city centre.

Target Population

The study targeted all undergraduate (regular and institutional-based) SWDs who were on session when the data was being collected between August and December 2016. This comprised 85 students enrolled in regular education programme: 62, 21 and 2 students with visual, physical and hearing impairments respectively. It also comprised of 30 students enrolled in institutional-based programmes: 18 students with visual impairments, 7 students with physical disabilities and 5 students with hearing disabilities.

Sampling Techniques and Sample Size

Sampling Techniques

The study adopted a stratified random sampling technique. The total number of SWDs who were registered by the two universities at the time when the data was being collected was first classified per programme of study and was further classified according to the type of disability. The population sample of more than twenty students per disability category was sampled but populations of less than twenty students were all examined.

Sample Size

A total of 60 students with visual, hearing and physical disabilities were sampled as presented in Table 1.

Table 1

Sample Size of SWDs

Category of SWDs	VI	HI	PH	Total
SWDs enrolled in REG	21	2	7	30
SWDs enrolled in IBP	18	5	7	30
Total	**39**	**7**	**14**	**60**

Research Instruments

Questionnaire and interviews were used to collect data. Questionnaires were developed based on the research questions and they were used to gather information on the cost of support provisions and regular learning needs required for effective inclusion and the available level of funding for university education from the SWDs. Interview schedules were also used to collect data regarding regular and special learning needs required for inclusion of SWDs. This method calls for direct contact between the researcher and the respondent (Kothari, 2004). Interviews with students with hearing impairments were conducted with the help of sign language interpreter.

Pilot Study

Before the actual study, a pilot study was conducted in the University of Nairobi. The population sample comprised twenty (20) students with disabilities; ten (10) with visual impairments, seven (7) with physical disabilities and three (3) with hearing impairments. The same instrument was administered to the same group of respondents after one month. The findings were analyzed and compared to establish validity and reliability of the instruments.

Validity

The validity of the instrument was tested through content validity and criterion validity. The test items of the research instruments were examined carefully with the guidance of the experts to ensure that they exhaustively answered the research questions and met the expectations of the research while the criterion validity was determined by subjecting the instrument to a pilot study.

Reliability

Reliability of the instruments was determined through test-retest method. The instruments were administered to the respondents and analyzed. After one month, the same instruments were

administered to the same respondents and analyzed. The Spearman Rank Order was then used to compute the Correlation Co-efficient of the two answers. This helped in determining the extent to which the contents were consistent in producing similar results. Using the Pearson Product Moment Formula, a correlation of 0.05 confidence interval level was used to determine the reliability of the items in questionnaires. The internal consistency value of 0.98 was established and indicated the reliability of the instruments.

Data Collection Procedures

After the acquisition of a research permit from the Ministry of Education, Science and Technology, the data were collected by the researcher using questionnaires and interviews. First, the researcher made a courtesy call to sample population of SWDs two weeks before data collection using the list and contacts obtained from Kenyatta University Students with Disability Office (KUSDO) and Maseno University to seek their consent. All SWDs who expressed willingness to participate in the study were also contacted to arrange an appointment in a quiet place on campus or any other place according to their preference after two weeks of the first contact and one week before the data collection.

During data collection, the purpose and procedure of the study were explained to the students before they responded to the questionnaires. The print questionnaires were converted to Braille for students who were totally blind while the font size of the questionnaires was magnified for persons with low vision to enhance their eligibility by the resource room assistance. The students then answered the research questionnaires individually within approximately forty minutes. The researcher personally administered the questionnaires and assisted the students by clarifying the questions where need be. Researcher also conducted interviews with SWDs which assisted in triangulating the results.

Data Analysis

Quantitative data was computed with the help of Statistical Package for Social Sciences (SPSS) version 13.1 computer software. Interview data were converted into a write-up based on concepts embedded in each interview question and the data obtained were then summarized, coded and analyzed using ATLAS.ti software package.

Results and Discussions

Enrolment per Type of Disabling Condition

Students with disabilities were also asked to indicate the type of the disabling condition. Figure 2 represents the findings.

Type of Disabling Condition

Category	Value
Physical Disability	27
Hearing Impaired	8
Visually Impaired	65
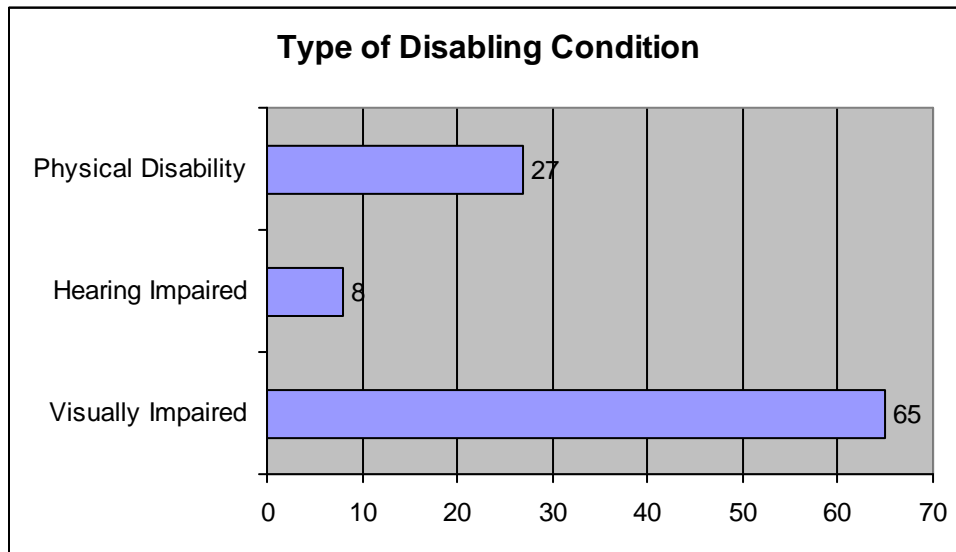
Figure 2. Enrolment per type of disabling condition

The result shows that the type of disability reported and registered in Kenyatta and Maseno Universities is visual, hearing and physical disabilities. The findings further revealed that the majority of this group of learners at 65% was visually impaired, as compared to students with physically disabilities representing 27% and students with hearing impairment representing only 8%. This findings revealed that students with hearing impairment are falling through the crack in university education system. This findings supports the findings by Jorgensen, Ferraro, Fichten, and Havel (2009) who established that factors such as demographic background among other factors affects access and retention of students enrolled in higher education and effects vary from one student sub-population including the type disabilities. This also supported the findings by Mugo, Oranga and Singal (2010) which established that SWDs are falling through the crack of higher education with the enrolment of students with hearing impairments being very limited. These findings suggest the need to put in place affirmative action to promote enrolment of students with hearing impairments in Kenyan public universities.

Enrolment per Gender

Fostered by a complex web of cultural, psychological, economic, historical, and political factors, gender imbalance in higher education is widespread across the developing world (Tefferra & Altbach, 2004). A study by Mama (2003) further established that this gender imbalance is magnified at higher quality and public institutions. Most studies reveal that this gender parity in these institutions of higher learning is mainly in favor of male students than female students with disabilities.

Data from Kenyatta University and Maseno University revealed that the composition of students with disabilities enrolled in both regular and institutional-based mode of study varied per gender. The findings revealed that the gender of the persons with visual, hearing and physical disabilities is in favor of male than female students as shown in the Figure below.
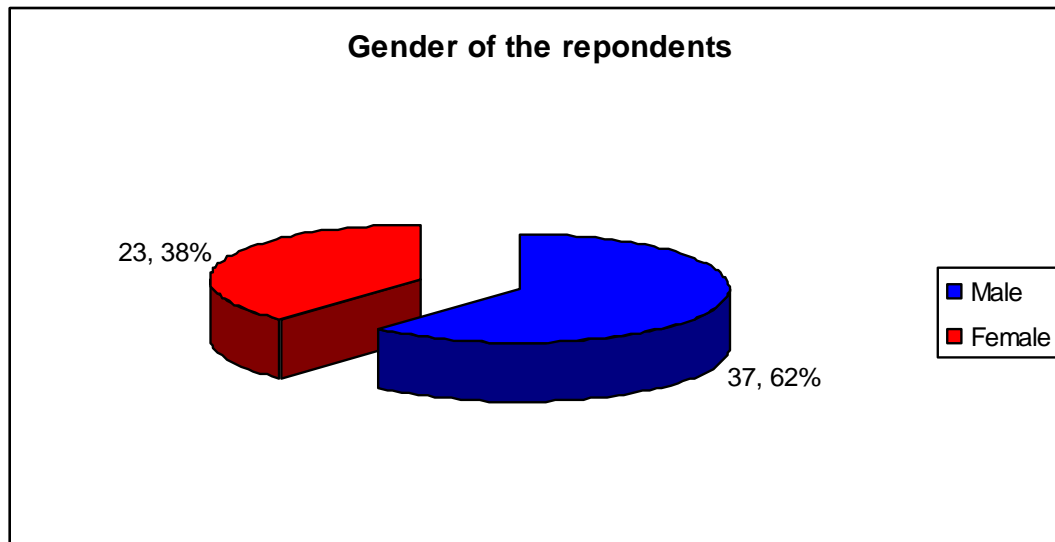
Figure 3. Enrolment per of SWDs per Gender

From Figure 3, it can be seen that 38% of the respondents were female while 62% were male. However, the finding contradict the findings by Jorgensen, Ferraro, Fichten, and Havel (2009) who established that when the age and entry grade of SWDs are controlled, male students dropped out at substantially higher rates than females.

This implies that very few female SWD enroll to public universities in Kenya. This may be attributed to the fact that female SWDs face double discrimination generates disadvantage, and

therefore a different experience in participation in higher education as compared to male students with disabilities. This finding points out the need instituted explicit disability gender based affirmative action policies which may include reduction of the cutoff score for admission to public universities and disability gender-based scholarships in order to encourage female SWDs to enroll in these institutions of higher learning.

Enrolment per Field of Study

The students were asked to indicate the course they are pursuing, the field and program of study and if self or Government sponsored. Table 2 presents the findings.

Table 2

Enrolment per Field of Study

Field of study	No. of students	%
Social Science	7	7
Science	2	3
Business/Commerce	1	3
Education	50	83
Social Science	7	5

Study findings revealed that while students with visual, hearing and physical disabilities not restricted in their choice of field of study, majority of the respondents (83%), were registered in education while the remaining (17%) were registered in social science representing (7%), Science representing (3%), Business/Commerce representing (3%) and social sciences representing (5%). This may imply that majority of SWDs tend to major in humanities courses that are well adapted to meet their learning needs as compared to science subjects. This finding support the finding by Mama (2003), who established that females which includes female SWDs are much less likely to enroll in math, science and business, and more likely to enroll in teaching and nursing.

The findings revealed that the significant discrepancy in enrolment per field of study experienced by the non-disabled students in public universities is more pronounced among female SWDs and therefore enrolment of SWDs in science and business courses is wanting. This findings point out the need to put in place explicit disability gender based affirmative action which will encourage female SWDs to enroll in science and business courses.

Enrolment per Program of Study

The students were asked to indicate the program of study and if self or Government sponsored. The following table presents the findings. Table 4 presents the findings.

Table 3

Enrolment per Program of Study

Program of study	No. of Students	%
Regular	77	84
Institutional based programme	15	16
Total	**92**	**100**

Study findings revealed that out of a total of ninety two (92) students with disabilities comprising, seventy seven (77) students representing 84% were enrolled in regular education programme while fifteen (15) students representing 16% were enrolled in institutional based programme.

Enrolment per Type of Sponsorship

The students were asked to indicate if they were either self or Government sponsored. Figure 4 presents the findings.
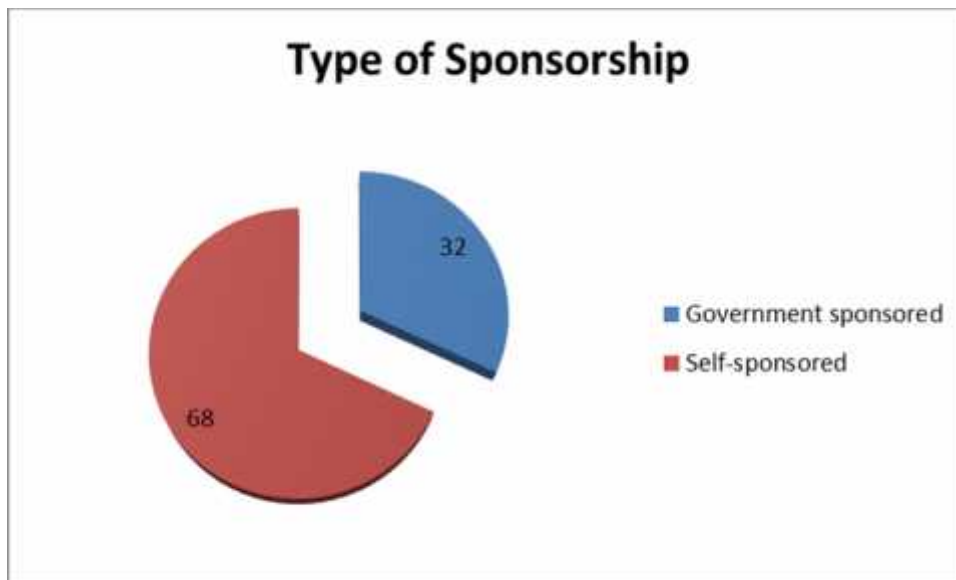
Figure 4. Enrolment per Type of Sponsorship

According to Figure 4, majority of students with visual, hearing and physical disabilities at 68% were self-sponsored while only 32% were enrolled as Government sponsored. This finding implies that majority of SWDs relies on Government financial support for their university education.

Summary

The findings reveal that there is disparity in enrolment of SWDs enrolled in public university and that it varies across gender, mode of study, type of attendance, discipline of study and field of study. The findings revealed that among the learners who pursued the first degree, most of them at (68%) were self-sponsored while (32%) were direct entry students. In terms of field of study, majority of these learners at (50%) were registered in education while the remaining (17%) were registered in other courses. In terms of programme of study, majority at eighty two (82%) were enrolled in regular education programme as compared to those enrolled in enrolled in institutional based programme while majority at 68% were enrolled in self-sponsored programmes as compared to those enrolled through Government sponsored programmes.

Conclusion

The findings revealed that there was a big discrepancy in enrolment per gender, programme of study, field of study and type of sponsorship. For instance, among SWDs who pursued the first degree, most of them at (68%) were self-sponsored while (32%) were direct entry students. In addition, majority of these learners at (50%) were registered in education while the remaining (17%) were registered in other courses. This findings point out the need to put in place explicit disability gender based affirmative action which will encourage female SWDs to enroll in these institutions of higher learning.

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An Analysis of Gender Dynamics and Staffing in the University Sector in Kenya

Prof. Jackson Too, Alice Kande and Silas Oure

Abstract

Over the years the clarion call to increase enrolments of girls at all school levels has been significant. Indeed, the just concluded Millennium Development Goals (MDGs) number three advocated for gender parity in school enrolment by 2015. Although good progress has been made in improving female representation in the different sectors in the country; data from universities has revealed that there are glaring disparities in qualification, rank and academic progression (CUE, 2016). Current data indicates that, of the total teaching staff of 16,301; 68% are male while 32% are female. That is, there are twice as many male teaching staff in the university as there are female. Of the academic staff with PhD qualification, 3,287 (27%) are male while 1,061 (9%) were female; those with masters are 3,885 (32%) male, while 2,068 (17%) are female (CUE, 2016). It is quite apparent from these statistics that female staff are not adequately represented in the university sector. More worrying is the distribution in ranks in the university: while there are 1,403 (9%) male Professors in the University, there are only 265 (2%) female Professors. The male Professors are more than four times the number of female Professors. The same pattern applies to the distribution of Senior Lecturer position. Most of the female staff in the university are concentrated in the lower ranks (Assistant Lecturer and Graduate Assistant). This scenario presents a challenge to any effort of trying to correct these imbalances. For female staff to make progress up the academic ladder, they must be in possession of a doctoral degree and it is in that level where they are least represented.

Key words: Academics, Staff Ratio, Gender, Career, Cluster, Disparity,

Introduction

University education is a critical component of human resource development. With the convergent impacts of globalization, the increasing importance of knowledge as a main driver of growth, and the information and communication revolution, an educated populace is vital in today's world. There is growing evidence that university education is critical to a country's efforts to increase social capital and promote social cohesion which is an important determinant of economic growth and development. It is pertinent to note that for a university to be globally

competitive and address the challenges of the 21st century, the programmes offered should be aligned to the dictates of the market to ensure quality and relevance. According to the Education For All National Review Report of 2015, enrolment in African countries has climbed sharply over the last 15 years, growing approximately 170% from 3.53 million students in 1999 (2.25 million in sub-Saharan Africa and 1.28 million in North Africa) to 9.54 million in 2012 (6.34 million in sub-Saharan and 3.2 million in North Africa).

Despite the overall increase of enrolment, female students enrolment continues to be threatened by cultural, social and economic factors (Beutel & Nelson, 2006). The spillover effect is the low levels of transition in tertiary institutions. According to Bunyi (2003) these can be attributed to a number of factors including; higher dropout rates, and poor performance of girls at the primary and secondary levels. In turn fewer females are accepted in institutions of higher learning. Other factors that exacerbate the gender gap in education include, insecurity, religion, child headed households, high levels of poverty, sexual abuse and long distances to schools. According to a study conducted by the African Population and Health Research Centre, girls are more affected by poverty, a factor that encourages early marriage (Mumah, Kabiru, Izugbara, & Mukiira, 2014).

In institutions of higher learning, women form a smaller percentage of students enrolled in public universities. More worrying is their representation in science and technically oriented disciplines such as engineering and architecture where male students continue to dominate over their female counterparts. This spills over to teaching in the university. Technical and science-based institutions also record a lower female enrolment as opposed to males. For instance female enrolment constitutes 44 percent of the total enrolment in Technical and Vocational Education Training (TVET) institutes. Enrolment and registration in science and technical areas is also low; for females in the Kenya Polytechnic, for example 52.4 percent have enrolled in business studies compared to 5 percent enrolled in engineering courses (Republic of Kenya, 2012). All these disparities in enrolments have implications to staffing at the university.

According to a study, *Gender Equity in Commonwealth Higher Education* (UNESCO, 2008), it was noted that a bias towards arts based disciplines in most East African institutions of higher learning can be attributed to lack of role models, fear of mathematics-related courses and *"unapproving"* attitudes towards females who showed an interest in non-traditional subjects such as agriculture, engineering and computing.

Although Kenya Vision 2030, places great emphasis on the link between Education, Training and the labour market as well as the need to create entrepreneurial skills and competencies among all irrespective of gender, ethnic background or religious affiliation; mid-term reviews of the Vision 2030 have shown that little progress has been made towards fulfilling that promise (Republic of Kenya, 2013).

Objectives

Based on data from universities, the following objectives guided this paper:

   i.   Establish the gender representation of academic staff in the universities;

  ii.   Determine the qualification of academic staff and its implications on faculty growth;

 iii.   Interrogate mechanisms of bridging gender disparities among staff in the universities.

Methodology

The method used to generate this paper was mainly desktop analysis of data already collected by the Commission for University Education (CUE) from all universities licensed to operate in Kenya. Extensive references were made to data contained in the book*: The State of University Education in Kenya* (CUE, 2016) as well as *Gender and Diversity Report* (CUE, 2016) all published by the Commission. Data pertaining to the gender variable on staffing and enrolment at the doctoral level were interrogated incisively. Library and Internet search was undertaken to get current related literature.

Data presentation

Academic Staff by Gender in Universities

Table 1 provides a summary of staff distribution by gender within and between Private and Public universities. The total academic staff in the universities was established to be 16,318 - of which 11,154 or 68% were male and 5,164 or 32% were female. Notable in Table 1 is that there are more female staff (35%) representation in Private Universities than Public (30%) Universities.

Table 1

Academic Staff by Gender in Public and Private Universities

Category	Female		Male		Total
	Count	%	Count	%	
Public Universities	3,650	30	8,363	70	12,013
Private Universities	1,514	35	2,791	65	4,305
Total	**5,164**	**32**	**11,154**	**68**	**16,318**

Source: CUE, Data (2016)

Although these statistics resonate well with the policy of one-third gender rule enshrined in the Kenya Constitution, it does not translate in the female staff enjoying all the privileges in the university sector. For instance, the representation of female staff in high academic ranks and administrative positions is quite low. Similarly few female staff are engaged in research activities. There are also more male staff who participate in international conferences than female staff. As female academics are few in the senior ranks, the pool of female mentors is relatively small. Thus cultivating senior female academics that can advance gender-sensitive institutional policies and provide mentorship to their junior colleagues is severely constrained. So while it is commendable to celebrate the increase in the number of female academics generally, there is need to create policies and affirmative pathways, which will not only sustain the gains made so far but also, accelerate their movement in the academic ladder. Figure 1 is a graphic illustration of the distribution of the female and male staff in the University.
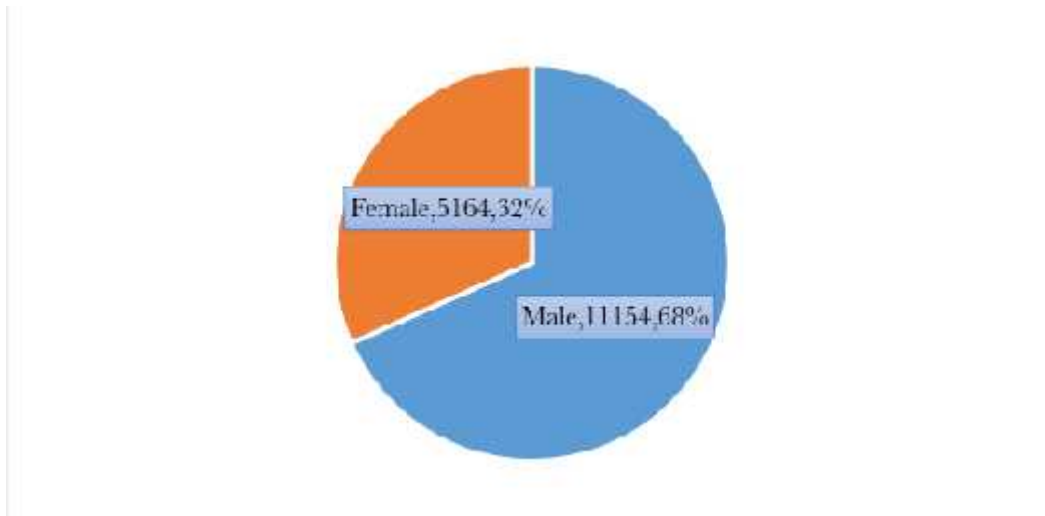
Figure 1. Academic Staff by Gender in Public and Private Universities (Source, CUE, 2016)

Ratio of Male to Female Enrolment per Academic Programme Level

In discussing gender dynamics in the university, it is important to look at some of the root causes of the imbalances currently obtained in the sector, which may explain these disparities. The overall ratio of male to female enrolment in all the universities is 3:2. However, there are more male enrolled students than females at PhD level, with a ratio of 2:1. At Bachelors level the ratio of male to female enrolment is 3:2. As more female students enrol at the Bachelors level the big gap at the graduate level reduces drastically.

The relatively rising numbers in female enrolments at Bachelors level may be attributed to the affirmative action policy which lowered the entry mark of female students by two scores. It is important that the numbers of female students enrolled at graduate level is boosted as this is the "breeding" ground for the university academics. There is therefore need to find an acceptable affirmative strategy to enhance female representation at that level. Table 2 shows the ratio of enrolment at each academic level.

Table 2

Ratio of Male to Female Enrolment per Academic Programme Level

Level	Male	Female	Male to Female Ratio
Bachelors	278,511	197,238	3:2
PG Diploma	940	452	2:1
Masters	32,912	22,549	3:2
PhD	4,915	2,232	2:1
Total	**317,278**	**222,471**	**3:2**

Source: CUE, Data (2016)

Academic staff by Gender, Qualification and University Categories

The total number of staff (PhDs, Masters, Bachelor and diplomas) in the universities was in the year 2015 was 16,318. Table 3 shows the number of academic staff by gender, qualifications and university category. Of the academic staff with PhD qualification, 4,215 were male while 1,389 were female; those with masters were 5,555 male while 3,138 were female. Of the academic staff with Bachelor's degree qualification; 913 were female while 452 were male.

Table 3

Academic staff by Gender, Qualification and University Categories

Qualification	Gender	University Category			Total
		Public Chartered Universities	Private Chartered Universities	Universities with LIA*	
PhD	Male	3,287	756	172	4,215
	% of total	20	5	1	26
	Female	1,061	280	48	1,389
	% of total	7	2	0.3	9
Masters	Male	3,885	1,226	444	5,555
	% of total	24	8	3	35
	Female	2,068	801	269	3,138
	% of total	13	5	2	20
Bachelors	Male	759	102	52	913
	% of total	5	0.6	0.3	5
	Female	345	72	35	452
	% of total	2	0.4	0.2	2

Source: CUE, Data (2016)

*Letters of Interim Authority

A closer look at these statistics reveals some interesting dynamics. The proportion of female academics is less than those of males in the three categories of universities and along the three academic levels. However, female academic staff are more represented within private universities, than in public universities. For instance, in Public Universities 20% of the staff with PhD are male, while only 7% are female i.e. there is a gap of 13%. In Private Universities, 5% of the staff with PhD are male, while only 2% are female (i.e. difference of 3%). The same trend is obtained with those who hold master's degree. The gap between the male and female staff is greater (11%) in Public Universities than in Private Universities (3%). Although at this level, the male academic staff are dominant over the female academic staff, the gap is much narrower compared with the doctoral level.

When the female academics are few at the PhD level, it has far reaching implications to their career development in the university sector. Without a PhD, female academic staff do not stand a chance of being promoted to the level of Senior Lecturer and above. Similarly, female academic staff may not be appointed to any senior administrative position in the university. This is a major setback for the female academics' advancement in the university sector.

University regulations do not allow academic staff without PhD to supervise post graduate students. This means that there will be fewer female academic staff available to supervise or to mentor post graduate students. This situation may have two negative effects. One is that, young potential female academics will lack role models whom they would look upon for guidance and inspiration. Secondly, the male academics being more than the female will be supervising female PhD students. In such situations, the challenges of power relations and cultural dictates might hamper serious academic engagements. Young female academics may not be free to ask incisive questions or seek clarifications on pertinent issues they wish to undertake research in when dealing with the male academics.

Cultural or religious inhibitions sometimes hinder in depth academic engagement and scrutiny when the male academics are supervising female candidates. Working closely and frequent encounters occasionally make women uncomfortable with the male supervisors – especially

when their meetings stretch into late hours or when they arrange to meet in none official days or even in un-official designations. All these are possibilities that affect the progression of learning and completion of graduate work.

Where the female academics are married, matters become even more complicated. Finding time to attend to numerous family obligations and keeping pace with the demands of graduate work is quite daunting. One would then appreciate the challenges that female academics go through in their quest to attain and match their male counterparts.

Distribution of Academic Staff by Gender and Rank

In terms of gender, the academic staff composition stood at 68% male and 32% female. The male staff dominates all ranks, except in the rank of graduate assistant where the difference is only 1%. The gender gap widens as the ranks progress to the level of Senior Lecturer and Professor. An in depth analysis of gender disparities in public and private universities reveals that the gap is much wider in public than in private universities. However, female staff are generally under-represented in all academic ranks. Table 4 provides this information.

Table 4

Distribution of Academic Staff by Gender and Rank

Gender		Professors	Senior Lecturers	Rank Lecturers	Assistant Lecturers	Graduate Assistants	Total
Male	Count	1,403	1,511	4,153	3,248	595	10,910
	% of Total	9%	9%	26%	20%	4%	68%
Female	Count	265	499	2,057	1,832	438	5,091
	% of Total	2%	3%	13%	11%	3%	32%
	Total Count	1,668	2,010	6,210	5,080	1,033	16,001
	% of Total Count	10%	13%	39%	32%	6%	100%

Source: CUE, Data (2016)

The rank of an academic staff in the university is of paramount importance as it determines the academic as well as administrative position one can hold. For instance the position of Dean, Director, Registrar, Principal, Deputy Vice Chancellor and Vice Chancellor are all dependent on

the rank of an academic staff. The low representation of female academics at higher ranks in the university means that few of them will hold key administrative academic or administrative positions. By extension, it also means that women generally will be excluded when key policy decisions are made. In the same breath, recruitment committees in the universities are often dominated by men who would most likely hire male staff once the bare minimum of one third rule has been taken care off. This perpetuates the marginalization or exclusion of female in the university sector.

To vindicate this argument, consider the present scenario where only 5 or 7% of the seventy (70) Vice Chancellors are women! Going by the Law or policy, the number of women Vice Chancellors ought to be at least 21 (30%). This is a blatant violation of the Law. In the political arena, the Kenya National Assembly, which enacted the Law has not complied with the Law as stipulated. The number of women representatives in August House is less than one third; which is a contradiction of the laws they have made and have sworn to protect.

Legal Provisions

The Constitution of Kenya makes provisions that outlaw discrimination against any person on grounds of gender, ethnicity, religion or disability. At the level of management, public chartered universities have not adhered to the two-thirds gender rule with the exception of three. It was noted in one of the Universities that all of the management staff are male. Like the Management, academic staff in most public chartered universities have not adhered to the two-thirds gender rule. Only five (5) out of the thirty-three (33) public universities have adhered to the rule.

Conclusion and Recommendations

Data has revealed that there are glaring disparities with gender in terms of university type (public or private); qualification and rank in the university sector. Although private universities have fewer staff compared to the public universities, the number of female staff compares favourably with the male staff. In public universities, the male staff far outnumber the female staff.

The high student-staff ratios currently experienced in universities present a daunting challenge to the teaching faculty as a whole, but particularly so for those in the early stages of their career.

The cluster, which had the highest staff to student ratios have been found to be in Education (Arts) and Social Sciences where most of the female staff are concentrated in. This is also where most students are enrolled. The workload that accompanies responsibility for large student numbers imposes significant career-stalling burdens on young female scholars. The anxiety that comes with such a burden, in a context that demands high standards of research productivity, can weigh down potential female academics.

In order to address this concern, institutions need to provide relief to those in the early stages of their careers while helping them to gain skills needed to meet career expectations. This can be done by giving them course releases; not assigning them the most highly-subscribed courses; providing them access to professional development opportunities that enable them to acquire pedagogical skills and to obtain an aptitude for balancing the multiple demands of academia and personal life (Tettey, 2010). Institutions' sensitivity and responsiveness to young employees' work-life circumstances is particularly helpful in attracting and retaining female academics whose careers tend to be significantly compromised by the contending demands of home and work.

The gender dimension of postgraduate enrolments and its implications, not only for the composition of the future faculty staff, but also in absolute numbers, cannot be ignored. Data cited in this paper shows significant gaps in the proportion of male and female enrolments at the postgraduate level. There is need to find an affirmative mechanism for supporting the female staff to earn PhD qualification.

Concerted efforts have to be put in place to encourage female enrolment in postgraduate programmes, support them to stay in those programmes, ensure that they are able to complete their programmes successfully, and to mentor them to pursue academic careers. These efforts will lead to growth in the numbers of female staff who can then serve as role models and mentors for subsequent generations of female students and help them sustain their careers when they become academics. Statistics have shown that programmes offered in Universities are heavily skewed towards Humanities and Arts; Social Science, Business and Administration.

In the same vein, female academic staff tends to be over-represented in Arts and Humanities domain while the male staff are found mainly in the Science, Technology and Mathematics disciplines. This situation presents a misleading picture on specialization in which Arts is seen as female-belonging terrain, while Science and Technology are the preserve of male academics. This requires a shift from that myopic lens to a more strategic programme development that ensures a healthy balance between Humanities/Arts and the urgency of building excellent capacity in areas of Health and Welfare, Science, Technology, Agriculture, Engineering, Manufacturing and Construction; and aligning research agendas closer to national development priority areas and sustainable development goals.

The need to increase enrolment in medicine, pharmacy, engineering and technical-based programmes of men and women alike cannot be over-emphasized, since there remains a shortage of these professionals in the country. Despite both male and female under- enrolment in these programmes, the case for enhancing the enrolment of female students is more compelling. Persistent gender imbalances at the tertiary level of education are a reflection of gender bias and structural differences in access to education (Kilemi, 2007). The under-representation of female students cuts across all the public universities, despite the application of affirmative action by the Kenya Universities and Colleges Placement Service (KUCCPS). This problem has roots in the country's education system as a whole.

Although educational programmes in primary and secondary education are outside the realm of university education, universities can make a substantive contribution in alleviating gender imbalance by encouraging women and girls to venture into the traditionally male-dominated fields of science and technology (ibid). More funding should be allocated to support Science, Technology, Engineering and Mathematics (STEM) subjects and sustained effort should be put to encourage students of both gender to enroll in STEM areas. The capacities of the universities to deliver quality training, research and innovation should be strengthened. Public – Private Partnerships and involvement of stakeholders should be enhanced to contribute to development of the university sector.

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An Audit of ICT Funding Towards Effective Integration of ICT in Selected TVET Institutions in Kenya

Mr. Tirus Muya Maina

Abstract

Developing countries like Kenya have begun to realize the significant role TVET has to play in the development of a competitive workforce and an equally discouraging realization has arose that Governments can no longer be expected to fund TVET to the heights required to meet the needs of the modern world thus Underfunding is an operational problem in the TVET sector. The study was an audit of ICT Funding on Effective Integration of ICTs in TVET institutions in Kenya with specific reference to Michuki and Thika Technical Training Institutes in Murang'a and Kiambu Counties respectively. The research adopted quantitative research approach and used probability sampling which is commonly associated with Survey-based research. The study's main data collection tool was a structured questionnaire. Descriptive statistics was used and simple regression equations were developed to test the strength of association between ICT Funding and integration of ICTs in Kenya TVET sector. The study revealed that Effective Integration is positively correlated with ICT Funding but their relationship is relatively low. The Government is the main source of funding for ICT projects and is not adequate to finance the ICT projects in the institution since the budget allocated is still relatively low compared to needs and priorities required to effectively implement the ICT integration. The Government should and has the primary obligation for TVET institution and should be committed to apportion substantial financial resources to the TVET sector as well as marshalling resources from its partners. The TVET institutions should address the funding challenges they face through generation of other financial resources.

Keywords: ICT Funding, TVET, Budget, Integration, Kenya

Introduction

According to CANTA (2012) the world has begun to realize the significant role TVET has to play in the development of a competitive workforce, an equally daunting realization has emerged that Governments can no longer be expected to fund TVET to the levels required to meet the needs of the modern world of work. Under-funding is a structural problem in the TVET sector in developing countries. The budget allocated is still relatively low compared to needs and priorities required to effectively implement the TVET policy especially on ICT Integration as noted by Musobo and Gaga (2012). TVET budgets are most often not prioritized within overall education budgets, with TVET often suffering from relative underfunding. Even though Governments may declare the importance of TVET, the budgets often do not reflect this priority. In many instances, TVET is spread among several Ministries, with no single point of oversight and no rationalization of resources (CANTA, 2012).

Studies by MacDonald, Nink, and Dugga (2010), suggest that for TVET institutions in Kenya to become a success, they need to have Government sustenance in the way of a continual funding stream. Studies by Wahba (2010) show that in Kenya and developing countries, ICT funding towards TVET is ad hoc and arbitral hence TVET Institutions have been neglected or overtaken by institutions engaged on purely academic education without any practical training. Dramatic budget cuts followed by structural adjustment programmes adversely affected public TVET systems in Kenya to a large extent as noted by Nyerere (2009). He also further noted that in Sub-Saharan Africa, as a result of budget slashes, there is reduced investments in TVET systems making facilities and equipment to decay. Most of the TVET institutions are grossly underfunded resulting to poor service delivery, the appalling state of equipment and instructional materials poor image as observed by Wahba (2010) and Mupinga, Busby, and Ngatiah (2006).

Hooker, et al.(2011) in their research found out that almost one third of the TVET institutions in Kenya don't have an ICT specific budget, signaling that ICT is not a priority issue for a significant number of institutions. The institutions that have an ICT specific budget specify mainly ICT infrastructure such as hardware, software and maintenance of equipment. Professional development in use of ICTs is only present in 33 percent of the budgets and hence not as prioritized.

Although expenditure on education in Kenya has been on the increase to an average of about 35 percent of the national budget, the allocation to the TVET sector has consistently been low thus contradicts the prioritization of TVET in Vision 2030 as highlighted by MoHEST (2008), in their strategic plan 2008-20012. The Government doesn't seem to tie its provided funds to the acquisition of computer equipment; rather it gives development funding that the institution can use for development related activities under which ICT procurement falls.

Like other African countries, TVET institutions in Kenya were funded by outside entities and used to receive a large portion of funding from external sources, however this is no longer the case, studies from Mupinga, Busby, & Ngatiah (2006) and MacDonald, Nink, & Dugga (2010) confirm. They also noted that, though these organizations provide needed funding for TVET, the funds are typically not available over a long span of time thus affects the provision and quality of TVET programs. There has been very little technical assistance or donor support from development partners towards technical education at all levels in recent years. Although the Government has the responsibility to fund TVET, this is proving difficult under present economic conditions therefore The TVET institutions in Kenya also have a role to play in addressing the funding challenges they face.

Tuition has traditionally been the source of revenue used to sustain technical education, but this has proved to be inadequate. Whereas national and county Governments assume the main financial responsibility for TVET, international partners are necessary for standard-setting, such as achieving internationally recognized practices in the field of TVET, among other responsibilities. UNESCO-UNEVOC (1996) classifies some of the better known financing mechanisms as follows: Public financing through revenue; Enterprise financing for training its own labour force; Private and public sponsored financing; International donor assistance.

The TVET institutions in Kenya need to secure other sources of funding for equipment and other instructional materials. MacDonald et al(2010) and Bates (2000) identifies several funding strategies that can be considered: Using external grants; Charging student technology fees; levying taxes; Increasing general operating grants from Government to support the use of

technology for teaching; Reallocating internal funds; employer financing; Centralizing or decentralizing funding; Balancing funding between infrastructure, administrative applications, and educational applications; Developing partnership or consortia.

Some TVET institutions also include entrepreneurial programs where students produce a product and learn how to market and sell the product, thus providing another funding source for the schools. While some institutions have put in place income generating activities, these are still weak and require to be strengthened. It is also not entirely clear the effect that these activities have had on the core mandates of these institutions. Community participation in financing TVET is low due to poverty and poor perception of TVET. Development financing which is crucial for capacity development and expansion has been minimal (Mupinga, Busby, & Ngatiah, 2006).

Aim of the Study

The aim of the study was an Audit of ICT Funding on Effective Integration of ICTs in TVET Institutions in Murang'a and Kiambu Counties, Kenya.

Research Questions

The study was guided by the following specific objectives:

1. Find out the adequacy of the Government as the main sources of funding for ICT projects in the TVET institutions
2. Find out the existence of the budget allocation for the ICT department in TVET Institutions
3. Determine the alternative sources of ICT funding for the TVET Institutions
4. The relationship between ICT Funding and Effective Integration of ICTs in TVET in Kenya

Research Methodology

Research Approaches

Creswell (2003) noted that if the problem is identifying factors that influence an outcome, the utility of an intervention, or understanding the best predictors of outcomes, then a quantitative approach is best. Quantitative research method is essentially about collecting numerical data to explain a particular phenomenon, particular questions seem immediately suited to being answered using quantitative approach.

Survey Research Design

The Survey used a cross-sectional research design that was carried out at just one point in time and popularly used in education (Creswell, 2012). According to Creswell (2008) this provides with a snapshot of what is happening in that group at that particular time. The researcher opted to use this kind of research in this study considering the desire to acquire vital data from the respondents so as to formulate rational and sound conclusions and recommendations.

Study Area

The study was confined to Michuki Technical Training Institute (MTTI) in Murang'a County and Thika Technical Training Institute (TTTI) in Kiambu County. Both Technical Training Institutes operate under the Education Act as stipulated in the Laws of Kenya. The Institutes operations are also carried out in accordance with the Government policies and procedures as spelt out in official documents and circulars. The Institutes are conscious of the Government's policy of industrialization by the year 2020, and the Vision 2030. They are gearing towards playing a significant and leading role in the fulfillment of this policies.

Target Population

The study sample was drawn from a population of 195 consisting of Management staff, which included Board of Management and the Principal. Administrative staff included Deputy Principal, Heads of Departments, Heads of Sections and Administration Assistant, teaching staff and technical staff as shown in Table 1.

Table 1

Target Population Table

Category	Size of stratum(N)		Total
	Michuki TTI	**Thika TTI**	
Management staff	7	9	16
Administrative staff	9	16	25
Teaching Staff	41	93	134
Technical staff	6	8	14
Total	**63**	**126**	**195**

 Source: Registrar office MTTI and TTTI, 2015

Sample Size and Sampling Techniques

The study adopted the probability sampling which is commonly associated with survey in which every individual in the population has an equal probability of being selected with randomization. A representative sample from a population provides ability to generalize the findings to a population (Babbie, 1990; Creswell, 2012). Stratified random sampling was used as the most appropriate sampling technique, since the population is not a homogeneous group (Kothari, 2009; Creswell, 2012). The population was divided into 4 sub- population Management staff, Administrative staff, teaching staff and Technical staff as shown in Table 1.

Sample Size Determination

To get sample size from the target population, Taro Yamane simplified formula was adopted, it provided a simplified formula to calculate sample size (Yamane, 1973). It's a random sampling technique formula to estimate sampling size and is used to calculate the sample size (n) given the population size (N) and a margin of error ( ) at 95 percent confidence level (Israel, 2013). The sample size of 150 respondents was represented as follows; 13 Management staff, 20 Administrative staff, 106 Teaching staff and 11 Technical staff as shown in the Distribution of Population sample in Table 2.

Table 2

Distribution of population sample

Category	Michuki TTI		Thika TTI		Total
	size of stratum (N)	sample size $i_1 = n\ (^N/_P)$	size of stratum (N)	sample size $i_2 = n\ (^N/_P)$	$i_{1+}\ i_2$
Management staff	7	6	9	7	13
Administrative staff	9	8	16	12	20
Teaching Staff	41	35	93	71	106
Technical staff	6	5	8	6	11
Total	**63**	**54**	**126**	**96**	**150**

Source: Registrar office MTTI and TTTI, 2015

Research Instruments and Data Collection Procedure

The main data collection tool was a structured questionnaire. The structured questionnaire was properly formatted with both open ended and closed questions adopting a five-point Likert scale with a view to uniformed information. A questionnaire is a form used in a survey design that participants in a study complete without intervention of the researchers collecting the data and return to the researcher (Wolf, 2008; Creswell, 2012; Rubin & Babbie, 2008). Observation method was also used by the researcher in the field as an independent evaluation tool to respond to research objectives.

Results and Discussion

This section presents the data from the respondents regarding the Audit of ICT Funding on Effective Integration of ICTs in TVET Institutions in Murang'a and Kiambu Counties, Kenya

The Government as a Source of Funding for ICT Projects in TVET Institution

The study sought to find out that whether the Government is the main source of funding for ICT projects in selected TVET Institutions in Kiambu and Murang'a Counties, Kenya.

Table 3

The Government as source of funding for ICT projects in TVET institutions

		Disagree	Undecided	Agree	Strongly Agree	Total
Institutions	Count	10	19	74	10	113
	% within Institution	8.8%	16.8%	65.5%	8.8%	100.0%

Source: Author Data (2015)

The study results revealed by Table 3 shows 74(65.5%) and 10(8.8%) of the respondent agree and strongly disagree that the Government is the main source of funding for ICT projects in the institution, 10(8.8%) disagreed and 19(16.8%) were undecided. From the findings it was revealed that the Government of Kenya is the main source of funding for ICT projects in TVET Institutions. The Government is the major financier and that its funds are used to finance public sector TVET Institutions as deduced by Raihan, (2013). Republic of Rwanda (2008) and Republic of Kenya, (2012) were in agreement of the findings that the Government has the primary responsibility for TVET and should be committed to allocate significant financial resources to the TVET sector as well as marshalling resources from its partner.

The Adequacy of Government Funding

The study sought to find out whether the Government funding is adequate to finance the ICT projects in selected TVET Institutions in Kiambu and Murang'a Counties, Kenya.

Table 4

The Government funding is adequate to finance the ICT projects in the institution

		Strongly Disagree	Disagree	Undecided	Total
Institutions	Count	15	82	16	113
	% within Institution	13.3%	72.6%	14.2%	100.0%

Source: Author Data (2015)

The findings of Table 4 reveals that 82(72.6%) and 15(13.3%) disagreed and strongly disagreed that the Government funding is adequate to finance the ICT projects in the institution and only 16 (14.2%) were undecided. The Government funding is not adequate as it has been noted by 85.8% of the respondents from Table 4 and supported by CANTA (2012) that an equally daunting realization has emerged that Governments can no longer be expected to fund TVET to the levels required to meet the needs of the modern world of work. Under-funding is a structural problem in the TVET sector in developing countries and the budget allocated by Government is still relatively low compared to needs and priorities required to effectively implement the TVET policy especially on ICT Integration as noted by Musobo & Gaga (2012).

The Budget Allocation for the ICT Department

The study sought to find out whether there are budget allocations for the ICT department in selected TVET Institutions in Kiambu and Murang'a Counties, Kenya.

Table 5

The Institution has budget allocation for the ICT department

		Disagree	Undecided	Agree	Strongly Agree	Total
Institutions	Count	4	18	70	21	113
	% within Institution	3.5%	15.9%	61.9%	18.6%	100.0%

Source: Author Data (2015)

The results from Table 5 showed that 70 (61.9%) and 21 (18.6%) of the respondents agreed and strongly agreed that the Institutions have budget allocations for the ICT department. Hooker, et al., (2011) in their research found out that almost one-third of the TVET institutions in Kenya don't have an ICT specific budget, signaling that ICT is not a priority issue for a significant number of Institutions. The institutions that have an ICT specific budget specify mainly on ICT infrastructure such as hardware, software and maintenance of equipment. Professional development in use of ICTs is only present in 33 percent of the budgets and hence not as prioritized.

The Internal Sources of Funding

The study sought to find out whether the internal sources of funding are adequate to finance the ICT projects in selected TVET Institutions in Kiambu and Murang'a Counties, Kenya.

Table 6

The internal sources of funding are adequate to finance the ICT projects in the institution

		Strongly Disagree	Disagree	Undecided	Agree	Total
Institutions	Count	17	65	16	15	113
	% within Institution	15.0%	57.5%	14.2%	13.3%	100.0%

Source: Author Data (2015)

The results from the Table 6 show that 65(57.5%) and 17(15%) disagreed and strongly disagreed that the internal sources of funding are adequate to finance the ICT projects in TVET Institutions, 15(13.3%) agreed and 16(14.2%) were undecided. From the findings of Table 6, it can be inferred that the internal sources of funding are not adequate to finance the ICT projects in the Institutions. Tuition has traditionally been the source of revenue used to sustain technical education, but this has proved to be inadequate, this concurs with the study findings of MacDonald et al. (2010).

The ICT Income-Generating Activities as Sources of Funds

The study sought to find out whether the Institutions generates financial resources through ICT income-generating activities in the selected TVET institutions in Kiambu and Murang'a Counties, Kenya.

Table 7

ICT income-generating activities as source of Funds

		Strongly Disagree	Disagree	Undecided	Agree	Total
Institutions	Count	15	88	6	4	113
	% within Institution	13.3%	77.9%	5.3%	3.5%	100.0%

Source: Author Data (2015)

The findings from Table 7 reveals that 88(77.9%) and 15(13.3%) of the respondent disagreed and strongly disagreed that the Institution generates financial resources through ICT income-generating activities such as cyber café and professional courses and 4(3.5%) of the respondent s agreed to statement. However, 91.2% of the respondents indicated that the respective Institutions have not incorporated entrepreneurial activities, this can be inferred that they have concentrated on tuition fees and Government as the main source of funding. Although the Government of Kenya has the responsibility to fund TVET, this is proving difficult under present economic conditions therefore the TVET Institutions in Kenya also have a role to play in addressing the funding challenges they face (Mupinga, Busby, & Ngatiah, 2006). MacDonald et al. (2010) noted that some TVET Institutions also include entrepreneurial programs where students produce a product and learn how to market and sell the product, thus providing another source of funding for the institution.

Government Budgetary Allocation Usage

The study sought to find out the Government budgetary allocation usage in the selected TVET Institutions in Kiambu and Murang'a Counties, Kenya. The findings in Figure 1 reveals that 41(36.30%) of the respondent indicated that Government budget allocation is used for development of ICT structures/buildings, 39(34.5%) for acquisition of ICT Hardware, 28 (24.8%) for maintenance of equipment and only 5(4.4%) to pay staff.
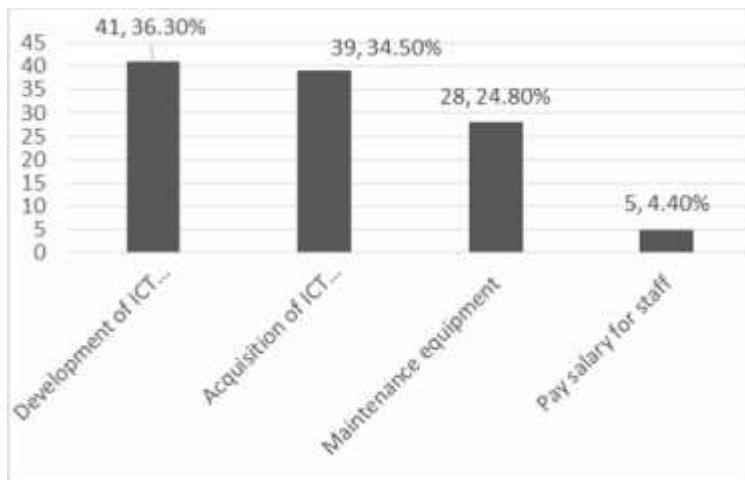
Figure 1. Government budgetary allocation usage *Source: Author Data (2015)*

From the findings it can be inferred that The Government doesn't seem to tie its provided funds to the acquisition of computer equipment; rather it gives development funding that the institution can use for development related activities under which ICT procurement falls as it is supported by MoHEST (2008).

Alternative Sources of Funding For the Institutions

The study sought to find out that whether there are alternative sources of funding for ICT projects in selected TVET Institutions in Kiambu and Murang'a Counties, Kenya.
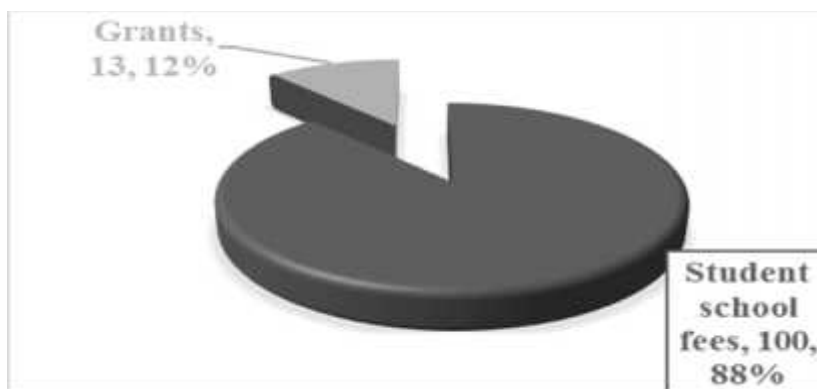
Figure 2. Alternative sources of funding for the institutions. Source: Author's Data (2015)

From Figure 2, the findings show that 100(88%) of the respondents indicated that the main alternative source of funding is payment of students school fees and only 12% said from grants. This can be inferred that TVET Institution in Kenya are dependent on students' school fee as the

main source of alternative funding. This finding were supported by UNESCO-UNEVOC (1996) that Tuition has traditionally been the source of revenue used to sustain technical education, but this has proved to be inadequate. Raihan (2013) concurred that students also contribute to TVET financing by paying tuition and examination fees.

The TVET institutions in Kenya need to secure other funding sources for equipment and other instructional materials. MacDonald et al., (2010) and Bates (2000) identifies several funding strategies that can be considered including: using external grants; charging student technology fees; levying taxes; increasing general operating grants from Government to support the use of technology for teaching; reallocating internal funds; employer financing; centralizing or decentralizing funding; balancing funding between infrastructure, administrative applications, and educational applications and developing partnership or consortia.

Relationship between ICT Funding and Effective Integration of ICTS in TVET in Kenya

The study sought to establish the relationship between ICT Funding and Integration of ICTs by using simple regression for the selected TVET institutions in Kiambu and Murang'a Counties, Kenya.

Table 8

Model Summary for Funding

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.591[a]	0.349	0.344	0.817

a. Predictors: (Constant), ICT Funding
b. Dependent Variable: Effective Integration
Source: Author's Data (2015)

Table 8 represents the simple correlation which indicates a degree of correlation. The R^2 value indicates how much of the dependent variable, Effectively Integration, can be explained by the independent variable, funding. In this case, 34.9% can be explained, which is relatively low.

Table 9

ANOVA Table Funding

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	39.814	1	39.814	59.627	000[b]
1	Residual	74.116	111	0.668		
	Total	113.929	112			

a. Dependent Variable: Effective Integration
b. Predictors: (Constant), ICT Funding
Source: Author's Data (2015)

The ANOVA Table 9 indicates that the regression model predicts the outcome variable significantly well. This indicates the statistical significance of the regression model that was applied since $p < 0.00$, which is less than 0.05, and indicates that, overall, the model applied can statistically significantly predict the outcome variable.

Table 10

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	0.798	0.434		1.837	69
1	ICT Funding	0.769	0.1	0.591	7.722	0

a. Dependent Variable: Effective Integration

Source: Author's Data (2015)

Table 10 provides the information needed to predict Effective Integration from ICT Funding. The constant and Effective Integration contribute significantly to the model thus can present the regression equation as;

Effective Integration = 0.798 + 0.769(ICT Funding)

From the regression analysis it can be inferred that the relationship between Effectively Integration and ICT funding is significant, positively correlated but the relationship is relatively low.

Summary of Findings, Conclusion and recommendation

Summary of findings

From the findings, it can be summarized that the Government is the main source of funding for ICT projects in TVET institutions in Kenya. The Government budgetary allocation is used for development of ICT structures/buildings but it is not adequate. The TVET institutions have budget allocation for the ICT department but it is relatively low compared to the needs and priorities required for Effective Integration of ICTs in TVET Institutions in Murang'a and Kiambu Counties. The findings further revealed that internal and external sources of funding are not adequate to finance the ICT projects in the institution and that the main alternative source of funding is payment of school fees by students.

From the regression analysis, the findings revealed that the relationship between Effective Integration and ICT Funding is significant, is positively correlated and their relationship is relatively weak.

Conclusion

Finally, it can be concluded that Effective Integration is positively correlated with ICT Funding but their relationship is relatively low. The Government is the main source of funding for ICT projects in TVET Institutions in Kenya and the funding is not adequate for the ICT projects in the institutions since the budget allocated is still relatively low compared to the needs and priorities required to effectively implement the ICT integration in TVET Institutions in Kenya.

Recommendations

The Government should and has the primary responsibility for TVET institutions and should be dedicated to apportion adequate financial resources to the TVET sector as well as marshalling resources from its partners for effective integration of ICTs. The TVET institutions in Kenya also have a role to play in addressing the ICT funding challenges they face by generating financial resources through income-generating activities and embracing partnerships with public and private sector, community and international partners and partnership with the industry to subside some of the cost. Finally the Government through the TVET Authority should make it mandatory for TVET institutions to have an ICT specific budget and allocate significant funds

mainly for capacity development and ICT infrastructure such as hardware, software, Internet provision and maintenance of equipment.

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**Assessment of Perceived Ease of Use and Instructional Use of ICT
By Lecturers in Technical Training Institutions in Kenya**

Peace B. Agufana, PhD, Jackson K. Too, PhD & Chris W. Mukwa, PhD

Abstract

In the past ten years, Information and Communication Technology (ICT) has become an essential part of our learning and development in education. The rapid development of these new technologies coupled with the worldwide challenge to educate all children has led to a global reform and development of teacher education and motivated educational institutions to redesign and restructure their teaching methods to enable students equip themselves for the future. The main purpose of this study therefore was to explore the relationship between Perceived Ease of Use and instructional use of ICT by Lecturers in Technical Training institutions in Kenya. The study adopted the quantitative research design. A sample size of 629 respondents was drawn from a total population of 2909 Lecturers in Technical Training institutions in Kenya. Data was collected using questionnaires. The quantitative data obtained from the administered questionnaires was analyzed using descriptive statistics. The findings indicated that use of ICT by lecturers' is perceived to greatly improve instruction. The study recommended that lecturers be encouraged to use ICT for instructional purposes because it greatly improves the instruction.

Key Words: Instructional Use of ICT, Perceived Ease of Use

Introduction

Yusuf (2005), posits that the field of education has been affected by Information and Communication Technology (ICT), which has undoubtedly affected teaching, learning, and research. Al-Ansari (2005) contends that a great deal of research has proven the great benefit ICT has on the quality of education. According to Davies and Tearle (1999), Lemke and Coughin (1998), ICT has the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's worker, as well as strengthening teaching and helping schools change. Some educational institutions in Kenya, have subscribed to e-resources consortiums e.g., Kenya Library Information Services Consortium (KLISC) and Kenya Education Network (KENET) that have boosted access to educational resources. Some institutions have also gone ahead to start offering e-learning, increasing access to education through instructional use of ICT.

Kenyatta University a chartered public university in Kenya can be a reference point in regard to embracing e-learning as it offers virtual learning to Online and Distance Learning (ODEL) students. According to Pelgrum (2001), many school leaders still perceive the lack of ICT-related knowledge of teachers as a major obstacle to the realization of their ICT-related goals. The literature describes the kind of skills teachers may need when integrating ICT in new student-centred learning approaches. However, identifying which competencies each teacher needs to acquire is far from simple, as this depends very much on the circumstances of their particular school. According to Davis, Preston, & Sahin (2009), personal teaching styles also play a major role and, 'one size fits all' approach does not usually work. Therefore, the need to recognize that substantial learning can take place while teaching, and even learning, from students can easily be achieved through use of ICT.

Global organizations have joined forces with national Governments, ministries, and institutions in implementing ICT in different sectors. Institutions of learning are reforming their systems to accommodate new media of learning. Within this framework, Africa is seeking to establish and improve its competence in ICT. In 2002, African states established the NEPAD (New Partnership for African Development) whose objectives strongly focus on the dual strategies of ICT Development (ICTD) and ICT for Development (ICT4D). The World Summit for Information Society (WSIS) held in 2003 identified a significant role for information and communication technologies in strategies for African development.

On ICT integration in Technical Training institutions in Kenya, a draft ICT lecturers' competencies framework and e-resource Centre have been developed. Eight (8) technical institutions have started offering Cisco Networking Academy Programmes meant to provide trainees with industry-valued certification in skills to repair and maintain computers. A sensitization workshop and training of teachers on the application of ICT to teaching, learning, and management has also been undertaken. As a way of enhancing greater application of ICTs in TVET, the Ministry of Education Science and Technology has developed a strategy for ICT integration in TVET; connected 43 TVET institutions to internet; started e learning in some programmes and integrated digital literacy course in TVET curricula (Education Sector 2013/2014-2015/2016 Medium Term Expenditure Framework, October 2012).

Continuing education models that will meet workers' lifelong learning needs have to be relevant and flexible to provide just-in-time learning without distance. ICT can play a crucial role in removing distance from education and in developing a lifelong learning culture in TVET. In spite of these potentials, little is known regarding the instructional usage of ICT in Technical Training institutions in Kenya. Therefore, it is against this background that the present study based on to assess perceived ease of use and instructional use of ICT in technical training institutions in Kenya.

Statement of the problem

An Institution's instructional environment impacts on students learning differently. These critical issues exist in the physical, academic and social dimensions of the institution. Research studies indicate that students are negatively affected by poorly equipped learning environments. This problem requires urgent attention as it affects the quality of instruction.

Prior empirical studies have strived to explicate the determinants and mechanisms of users' adoption decisions on the basis of the Technology Acceptance Model (TAM) (Davis, Bagozzi, & Warshaw, 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000) with the conviction that the adoption process influences successful use of particular technology systems (Karahanna, Straub, & Chervany, 1999; Liao, Palvia, & Chen, 2009).

In East Africa, Zigama (2010) investigated the factors affecting primary school teachers' attitudes towards ICT in education in Rwanda, and found out that primary school teachers on overall had a positive attitude towards ICT in education. A few studies have been conducted in Kenya on acceptance of instructional use of ICT. Chemwei (2013) while investigating the factors influencing teacher educators' level of Information Technology Integration in teaching in primary teacher training colleges found out that while ICT's are integrated in primary teacher training colleges in Kenya, their level of integration is quite low. Wanjala (2010) carried out a study on factors affecting the integration of computers in mathematics instruction in secondary schools in Kenya and found out that teachers' attitudes, self-confidence, perceived

usefulness/relevance, accessibility, pedagogical practices and policy formulation were among the determinants to teachers computer technology use.

It is difficult and maybe even impossible to visualize future learning environments that are not supported, in one way or another, by ICT. With the widespread adoption and use of ICT in the world, especially by the young who are at times referred to as the 'digital generation', it is clear that ICT will affect the complete learning process today and in the future.

From the above review, it is evident that little research has been done on perceived ease of use and instructional use of ICT. Therefore, the researcher in this study, tries to address this gap by investigating perceived ease of use and instructional use of ICT by Lecturers. The researcher aims at reporting the perception of lecturers towards ease of use of ICT in technical training institutions in Kenya.

The findings of the study will provide insightful reference for educational policy makers, and would benefit a cross-section of education stakeholders, researchers, and scholars in Kenya. The study would also add knowledge to the area of educational policy.

Purpose of the Study

The purpose of the study was to investigate the relationship between perceived ease of use, and instructional use of ICT in technical training institutions in Kenya. The specific objectives of this study were to: establish Lecturers, ease of learning to operate ICT; determine Lecturers' flexibility of interacting with ICT; examine the mental effort required by Lecturers' to interact with ICT; and assess the effort required by Lecturers' to become skilful at using ICT.

Materials and Methods

This study was conducted on Lecturers in Technical Training institutions in the Republic of Kenya. The research adopted the quantitative research design as it tried to identify broad trends in a population, and in the end generalize the findings over a large population who are Lecturers' in Technical Training institutions in Kenya.

The researcher settled on the quantitative research design for the present study because it seeks to gain insight into an occurrence as a way of providing information on the perceived ease of use of ICT in technical training institutes which are many in Kenya. The characteristics of the design were non-experimental and dealt with variables in their natural settings. According to Polit and Hungler (2004), research methodology is a way of obtaining, organizing and analyzing data and thus methodology decisions often depend on the nature of the research questions. In this study, the methodology refers to how the research was done and its logical sequence.

In the present study, all Lecturers in Technical Training institutions in Kenya were targeted to take part in the study as respondents. According to Burns and Grove (2003) population refers to all the elements that meet the criteria for inclusion in a study. In other words, population is the aggregate of all that conforms to a given specification.

Stratified random sampling was used to get representation from lecturers in Technical Training institutions across the country. Wimmer and Dominick (2006) support the use of stratifying in cases where respondents belong to identifiable subgroups, in order to give each person in the population an equal chance of being selected. Stratifying lecturers according to the regions they taught guaranteed the desired distribution across the country hence improved the representativeness of the sample. To get the desired representative distribution across the eight (8) strata's, the following sample was drawn with respect to the actual population ratios of lecturers in Technical Training institutions as follows: Central (n=122); Coast (n=41); Nairobi (n=98); Rift Valley (n=148); Western (n=46); Nyanza (n=90); North Eastern (n=10); Eastern (n=74). The total sampled respondents were 629.

The researcher used a standardized questionnaire for data collection. The choice of the data collection instrument is often very crucial to the success of a research and thus when determining an appropriate data collection method, one has to take into account the complexity of the topic, response rate, time and the targeted population. According to Parahoo (1997), a research instrument is a tool used to collect data. Research instruments are therefore useful to researchers because they help in data collection.

The research used questionnaires presented in structured and semi-structured questions and a four (4) point Likert scale. Likert scales are good because they show the strength of the persons feelings to whatever is in the questions, they are easy to analyze, they are easy to collect data, they are more expansive and they are quick (Kothari, 2004).

In data analysis, descriptive statistics (Percentages and frequencies) were calculated on the variables to summarize and describe the data collected. Quantitative data was displayed using appropriate tables that depicted the relationship between the dependent variable and the independent variables. Inferences were made from the trends observed from the analyzed data and were used to reach conclusions and make generalizations about the characteristics of populations based on data collected from the respondents. This agrees with Hyndman (2008), who posits that data processing involves translating the answers on a questionnaire into a form that can be manipulated to produce statistics. This involves coding, editing, data entry, and monitoring the whole data processing procedure.

Results and Discussion

The aim of the study investigated perceived ease of use and instructional use of ICT by Lecturers in Technical Training institutions in Kenya. The key Ease of Use factors of interest to the study were to: establish Lecturers ease of learning to operate ICT; determine Lecturers flexibility of interacting with ICT; examine the mental effort required by lecturers to interact with ICT; and assess the effort required by lecturers to become skilful at using ICT. The following sections highlight the study results on these set of perceived ease of use factors.

The first question item investigated how easy it was for Lecturers to operate ICT. Table 1 shows the response on this item. The study results revealed that 47.5% of lecturers often regarded learning to operate ICT as easy, while another 37.5% of lecturers sometimes regarded learning to use ICT use as easy. From these findings, we can make several inferences. Firstly, learning to operate ICT was easy. Secondly, lecturers could easily acquire ICT skills to use in instruction. Thirdly, lecturers could easily use ICT in instruction. This agrees with Karaliotas (1977), who posits that resource-based method of teaching, which is a hallmark of Computer Assisted

Learning, defines the position of a teacher as a facilitator in the learning process, rather than a source of knowledge. In general, learning to operate ICT was easy.

Table 1

Ease of Learning to Operate ICT

	Frequency	Percentage
Often	265	47.5
Sometimes	209	37.5
Rarely	42	7.5
Never	42	7.5

Source: Primary Research Data (2013)

The second item in this question item investigated Lecturers' flexibility of interacting with ICT and results are presented in Table 2. The study results revealed that 52.5% of lecturers often find it flexible to interact with ICT, while another 32.5% of lecturers sometimes find it flexible to interact with ICT. From the results, we can infer that Lecturers' interacted with ICT flexibly. Tully (2003) in light of this states that the environment where one grows up can determine his or her ability to fully use modern technologies. In general, lecturers interacted with ICT flexibly.

Table 2

Flexibility of Interacting with ICT

	Frequency	Percentage
Often	293	52.5
Sometimes	181	32.5
Rarely	56	10.0
Never	28	5.0

Source: Primary Research Data (2013)

The study also investigated the mental effort required by Lecturers' to interact with ICT. Table 3 shows the response on the level of mental effort required to interact. The study results revealed that 47.5% of lecturers sometimes find that they required a lot of mental effort to interact with

ICT, while another 32.5% rarely required a lot of mental effort to interact with ICT. From the above findings, we can infer that Lecturers' did not require a lot of mental effort to interact with ICT. This is echoed by Punie and Canberra (2006), who posit that the role of ICT in instruction should be seen in the light of its contribution to emancipation, empowerment, and self-fulfillment of individuals using it. In general, interacting with ICT was easy.

Table 3

Mental Effort of Interacting with ICT

	Frequency	**Percentage**
Often	56	10.0
Sometimes	265	47.5
Rarely	181	32.5
Never	56	10.0

Source: Primary Research Data (2013)

The last question item in this section investigated the effort required by Lecturers' to become skillful at using ICT. The findings are presented in Table 4. The study results revealed that 47.5% of lecturers sometimes required a lot of effort to become skillful at using ICT, while another 27.5% often required a lot of effort to become skillful at using ICT. We can make several inferences from this research data. Firstly, it needs to put in a lot of effort to be skillful at using ICT. Secondly, to be skillful in using ICT there is need for a lot of exposure. Thirdly, practical handling of ICT was necessary in order to enhance use of ICT. This agrees with Lankshear & Snyder (2000), who posit that there is no doubt that teachers who use ICT in classrooms have to demonstrate high levels of energy, hard work and perseverance, often in the 'face of considerable odds'. In, general, a lot of effort is required to become skillful at using ICT.

Table 4

Effort required to become Skillful at Using ICT

	Frequency	Percentage
Often	153	27.5
Sometimes	265	47.5
Rarely	70	12.5
Never	70	12.5

Source: Primary Research Data (2013)

Conclusion

The study sought to assess perceived ease of use and instructional use of ICT by lecturers in Technical Training institutions in Kenya. Based on the findings of this study, it was concluded that; learning to operate ICT was easy, lecturers interacted with ICT flexibly, and interacting with ICT was easy. However, a lot of effort is required to become skillful at using ICT. Therefore, Lecturers in Technical Training institutions perceived instructional use of ICT as easy, and this can be harnessed for use for instructional purposes.

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**Interrogating the Harmonized Promotion Criteria Towards
Quality Assurance in Kenya's University System**
Fuchaka Waswa, Daniel Akunga and Mark Obonyo

Abstract

That the quality of higher education in Kenya has deteriorated in recent times is not in doubt. While the causes are myriad, a hitherto conveniently forgotten component when it comes to intervention measures is the quality of academic staff. For the last several decades, University Councils have been complicit in the devaluation and degradation of the title "Professor" as evidenced by different qualifications and competences attracting this same position across public and private universities. This translates into loss of quality in teaching and training, research, consultancies and community service. Inter-personal respect among dons has also suffered, while the public no longer esteems the highest academic titles in Universities. While the effort made by the Commission for University Education towards harmonizing promotion criteria is commendable, gaps still exist there-in that are likely to permit mischief and unfair competition to thrive in upward mobility. Further, the harmonised criteria is silent on the way forward when it comes to academic staff who have been promoted fraudulently in the past and still would not qualify for the positions they hold were they to be vetted on these harmonised guidelines. This paper has elaborated on these concerns among others and provided possible solutions to maximise benefits from the harmonized criteria. The academic staff union is a key stakeholder in University Education and is convinced that ideas represented in this paper will go a long way to add value to quality assurance in higher education in Kenya and beyond.

Key Words: Standards, Upward Mobility, Academic Staff, Universities

Introduction

Due to *massification* of university education in Kenya the demand for academic staff with PhD qualification has been on the increase. To address this challenge that is also driven by inter-university competition for staff, academic *nomadism* for quick promotions and irregular intra-university promotions have been popular practices.

The consequence has been disparities in appointments and promotion of academic staff and hence low morale on the part of deserving yet marginalised staff. Consequently the expected quality in higher education, particularly the teaching function has taken a drastic decline (Waswa, 2016).

From not having common promotion criteria in the past, and catalysed by unethical practices, Universities in Kenya are populated by persons who at best are fraudsters as far as their academic grades are concerned. In a few cases intra-staff academic and intellectual cum professional respect does not exist under such circumstances where mediocrity appears to be rewarded, while meritocracy and academic freedom tends to be punished. Under such circumstances, disenfranchised academic staff often withhold their best in service delivery (teaching, research and community service), which leads to poor quality of the human resource universities deliver to society for national development. This explains in part why the Commission for University Education (CUE) has attempted to address these differential appointment and promotion for academic staff through harmonised criteria. The guidelines developed however have some gaps that may undermine the envisaged goal of harmonization and standardization. The strengths and weaknesses that exist in these criteria for the smooth running of Kenyan universities is the central thesis of this discussion paper.

It is hoped that the gaps articulated and past anomalies cum injustices in promotions will be addressed in accordance with article 41 (1) of the Constitution of Kenya that provides for fair labour practices and article 232 (1) that provides for principles and values of public service, and in particular sections that outline high standards of professional ethics; involvement of the people in the process of policy making and fair competition and merit as the basis of appointments and promotions (Republic of Kenya, 2010). The Commission too in performing its functions as stipulated in article 5 (1) (a, c and h) of the Universities Act 2012 should maximise on the positive aspects of this paper and not view the paper as an attack on its competence.

Procedure of Interrogating the Criteria

In interrogating the harmonised criteria the authors made reference to several documents including Universities Act, 2012, report of the committee on minimum criteria for appointment and promotion of academic staff in universities in Kenya (2015), the 2010 national Constitution and a variety of secondary data among others. Informal discussions were also held with members of the academic staff across the established grades to gauge their level of participation in the development, and awareness of the existence of the harmonised criteria. By virtue of the authors placement, much of the data (tangible and tacit) used in this paper was solicited from Kenyatta University. Taking cognisance of the University's premier status, the content of this paper plausibly represents the widely held views and opinions of key stakeholders, who are supposed to be served by these appointment and promotion criteria. The authors equally acknowledge that an audit study of the harmonised criteria across stakeholder universities would yields more information critical in its improvement for posterity.

Gap Items in Process and Substance of the Harmonised Promotion Criteria

Composition of Criteria Harmonization Committee

The report of the committee on minimum criteria for appointment and promotion of academic staff in Universities in Kenya dated April 2015 details the membership that developed the harmonised guidelines. While some form of stakeholder participation is implied, this list fails to capture the minimum representation, particularly from teaching staff from public universities who are main clientele affected by the promotion criteria. The Commission is also silent on whether several prior consultative meetings with key stakeholders were held. A bottom-up approach involving key stakeholders from departments and cascading to the Council of each University would have added much needed value in content and representation. A final representative team/committee with the Commission as secretariat would then have collated and harmonised the various opinions before subjecting the harmonised draft to various senates for further fine-tuning and adoption. A random check among academic staff indicated lack of awareness of any such process, meaning the level of representation and participatory decision-making falls below expectations.

In the final list provided by the Commission, membership from pioneer and leading Kenyan Universities was conspicuously missing thus denying the harmonization team the valuable experience on past promotion dynamics and their implications. Relying mainly on top level University managers failed to take cognisance of full representation, participation and inclusiveness of key stakeholders as envisaged in the national Constitution. It is the position of this discussion paper that based on a bottom-up approach as indicated in preceding sections, the final drafting committee should have at the minimum composed of:

1. *A sample of Bonafide* professors whose promotions attract academic respect to represent various senates

2. Membership from IUCEA for benchmarking in the spirit of regional integration

3. Membership from the Academic Staff Unions by virtue of their role in welfare enhancement

4. Membership from the Vice Chancellors being the Chief Executive Officers of Universities

5. Membership from University Council Chairpersons by virtue of their role in policy formulation and implementation

6. Retired professors who attract intellectual and research respect within academic circles

7. The Commission for University Education as the secretariat

Grading Nomenclature

Table 1 describes the grading nomenclature (CUE, 2014) and associated qualifications of academic staff (Article Authors, 2016). The Commission rightly indicates that the grade of Graduate Assistant/Research Assistant is contractual and is meant to facilitate identification of outstanding Bachelor's degree holders to be trained for academic positions (i.e. succession staff development). Traditionally, outstanding Bachelors were represented by first class honours degrees, and planning for staff development was reserved for first class honours, although this tradition has slowly died out. Opening up this position to persons with an upper second class honours qualification as indicated in CUE (2014) is tantamount to creating a loophole that could be exploited through unethical practices to marginalise the first class honours graduates whose numbers continue to increase with every graduation ceremony. Ultimately the risk of failure to plan for continuity/succession within teaching staff is real.

Table 1

Grading nomenclature

SN	Academic level	Expected minimum qualifications
1	Graduate Assistant/Research Assistant	Bachelor's degree of 1st class honours and enrolled into a master degree programme for staff development.
2	Tutorial Fellow/Junior Research Fellow	Master's degree
3	Lecturer/Research Fellow	PhD or Masters+
4	Senior Lecturer/Senior Research Fellow	PhD++
5	Associate Professor	PhD+++
6	Professor	PhD++++
7	Adjunct Academic Staff	PhD
8	Visiting Academic Staff	PhD or Masters with 5 years of active experience in industry.

Notes: + means other additional requirements in increasing quantities

Although the Commission proposes a system of maintaining an updated list of bona fide Professors and a proviso to publish the list on its website, to date no such list exists. While the vision is noble, the list must be linked to individuals' downloadable Curriculum Vitae in prescribed format for accountability to the tax-paying public that sustains their remunerations. The public must be proud of its professors, hence the need to be transparent and NOT opaque. Such a list would also provide Government and other interested parties a quick reference for identifying persons for specialized tasks and networking.

Awarding Points for Administration Responsibilities

In this paper, we argue that awarding points based on administration responsibilities should be removed from the criteria because academic staff members do not have equal chances of landing such positions, by virtue of the appointments being at the discretion of Vice Chancellors. These positions tend to benefit people based on factors like loyalty perceptions rather than competence and seniority. In addition, assuming that fairness is upheld in such appointments, it would take for example 30 years for the 15th most senior lecturer in a department to be appointed as chairperson, based on a term limit of two years. Besides, holders of such positions are already compensated through reduced workloads and monthly allowances. Consequently including this

item in the guidelines translates into multiple compensation and unfairness that significantly disadvantages ordinary academic staff. Best practices in world class Universities base such administrative appointments on seniority in the department in order to avoid cases where newly graduated PhD holders suddenly become managers of their Professor supervisors who have not held such offices in the past. Such contradiction can be exemplified in the unlikely event where generals in the military are forced to take orders from sergeants! The negative impact on the professors' sapiential authority and influence cannot be overemphasised.

Weighted Publication Points for Multiple Authorship

In the harmonised guidelines, scientific publication on a minimum is weighted at 50% making this item the most important across all academic grades. Traditionally, the first author contributes most and also receives most of the credit. The positions of subsequent authors are usually decided based on contribution, alphabetical order, or reverse seniority. While ranking the first or second author in a two-author paper is straightforward, the meaning of position becomes increasingly arbitrary as the number of authors increases beyond two. The practice in the biomedical sciences often places the last author in the same league as the first because he or she is assumed to be the driving force, both intellectually and financially. According to Lawrence (2006) and Weltzein et al. (2006) there is no accepted yardstick in assessing the actual contribution of an author to a given scientific publications. As such, interpretation of author sequence can be like a lottery.

In the harmonised guidelines, it is assumed that contribution of authors reduces sequentially, which may not be the case. A simple and straightforward approach to estimate the credit to be attached to a series of authors that is free from any arbitrary rank valuation is needed. This will eliminate the danger of rewarding academic fraud, stifling of multidisciplinary research activities, and intimidation of junior authors by their seniors. Although the first author is widely assumed to have made the greatest contribution in a multi-authored publication (Hunt, 1991; Schmidt, 1987 and Verhagens, *et al*, 2003), assigning credits to subsequent authors differs across traditions, scientific fields, and countries (Lawrence, 2006 and Weltzein *et al*., 2006). A practical example of differential crediting is given in Table 2.

Table 2

Models of allocating publication points (exemplified on a 5-authorship case)

Author	SDC CUE	EC	FLAE	%. PCI
1	2.67	1.6	3.82	60 = 4.82
2	2.13	1.6	0.75	20 = 1.59
3	1.6	1.6	0.75	10 = 0.82
4	1.07	1.6	0.75	05 = 0.38
5	0.53	1.6	1.92	05 = 0.38
Total	**8**	**8**	**8**	**100% =8.00**

Notes: SDC: Sequence Determines Credit, EC: Equal Contribution; FLAE: First Last Author Emphasis; PCI: Percent Contribution Indicated; CUE: Harmonised guidelines. The totals are based on CUE's basis of 8 as maximum publication points per paper.

According to the Sequence-Determines-Credit" (SDC) approach, which the harmonised guidelines seems to have adopted, five authors would share publications points as shown in column one regardless of their contribution to the paper. The sequence of authors in this case reflects the declining importance of their contribution, as suggested by previous authors (Hunt, 1991; Schmidt, 1987 and Verhagens, *et al,* 2003). That author five would be significantly disadvantaged is apparent. While this approach eliminates "Joy-riding" it could also discourage teamwork, networking and partnership because of the decreasing points one earns along the authors' list. The SDC approach, which seems to be recommended procedure in the harmonised criteria fails to take into considerations other internationally established norms like FLAE, EC as well as PCI. Where equal contribution is the model, authors obtain equal credits in this case, 1.6 for each of the five authors. This approach is likely to encourage team work and collaboration, tenets that are the norm in contemporary research for development.

The "first-last-author-emphasis" (FLAE) is commonly applied in biomedical and laboratory-based researches. This criterion places great emphasis on the first and last authors. The first author gets credit of the whole impact, the last author half, and the credit of the other authors in the middle is the impact divided by the number of all authors. In the "percent-contribution-indicated" approach (PCI), credits are awarded based on actual contribution to the paper as agreed upon by the authors (Anderson, 1992). This approach too is likely to enhance partnerships and collaborations, while stifling *joy-riding*.

While scoring for minimum publication points in preceding write-ups and summarised tabulations for lecturers and senior lecturers is consistent at 24 and 32 respectively, inconsistencies for associate professors and professors exist at 48 (36) and 60 (39) respectively (Table 3a).

Table 3a

Academic Staff compared on publication points and postgraduate supervision

Grade	Min Publ. Pts.	Cumulative score	PhDs supervised	Cumulative score	Masters supervised	Cumulative score
L	24	24	0	0	0	0
SL	32	56	0	0	3	3
AP	48 (36)	104 (92)	1	1	5	8
P	60 (39)	164 (131)	2	3	6	14

Notes:

  i) L: Lecturer; SL: Senior Lecturer; AP: Associate Professor; P: Professor.

  ii) Minimum publications Points for Lecturer and SL are consistent in write up and table (see section 3.3 and 3.4 of CUE (2014) harmonized criteria.

  iii) For AP and P, the Figures conflict: 48 in the write up and 36 in table for AP and 60 in write-up and 39 in table for P.

In an attempt to create consistency, the authors adjusted the minimum publication points using 8 as the maximum points for a publication and hence 3 papers as the minimum papers a lecturer must have in order to score the minimum 24 publication points (Table 3b). The Senior Lecturer follows with 4 papers or 32 publication points. For the Associate Professor two scenarios emerge: 6 publications (48 publications points) or 4.5 publications (40 publication points). For the Professor inconsistency exists as exemplified by either 7.5 publications (60 publication points) or 4.8 publications (39 publication points). Based on equivalent publication numbers the gap between Lecturer and Senior Lecturer is 1, that between Senior Lecturer and Associate Professor is 2, while the gap between Associate Professor and Professor is also 2 (see Table 3b column c and round off 7.5 to 8). By implication the effort needed for one to become a Professor is minimized instead of being increased.

Table 3b

Inconsistencies around Minimum Publication Points for APs and Ps

		Current status (CUE, 2014)		Authors' Suggestions		
a	b	c	d	e	f	g
Grade	Min. Publ Point	Equivalent No. of publications	Cumulated publications	Equivalent No. of publications	Min Pub Point	Cum Score
L	24	3	3	3	24	24
SL	32	4	7	4	32	56
AP	48 (36)	6 (4.5 5)	13 (17.5 18)	6	48	104
P	60 (39)	7.5 (4.8 5)	20.5 (22.3 22)	8 (9)	64 (72)	168 (176)

To equitably separate the Professor from the Associate Professor, the interval between them in terms of number of publications should change from 2 to 3, which translates into 9 publications or 72 minimum publications points, and hence 176 cumulative publications points (see column g Table 3b). The Commission needs to consider this suggestion in order to set apart the Professor from the Associate Professor, while respecting equity principles.

Separating this points (or number of publications) would yield three distinct statistical levels, thus: Lecturer-Senior Lecturer; Associate Professor and Professor (see Figure 1). That means the Professor must stand out prominently from an Associate Professor, while an Associate Professor must standout prominently from a Senior Lecturer. The question to ask is whether their remunerations reflect this pattern. While equity in remuneration is necessary, inter-grade gaps must also be wide enough to encourage people to seek to climb upwards. Insignificant additional remuneration undermines hard work as people get contented in their current positions.

It is the opinion of the authors that all fake grades corruptly earned should be revoked and persons placed in their rightful grades if the respect of academic and merit in higher education could be reclaimed. On the minimum promotion to associate and full professor must be based on cumulative performance at all other previous levels in addition to the minimum requirements to this position. This way persons who were promoted irregularly in preceding grades will not qualify for the ultimate academic position (Professor), thus sanctifying and rightly compensating this position. *Bona fide* Professors should then be recognised and be required to give their

inaugural lectures within one year of the promotion, after which an additional allowance should be factored in their remuneration package.
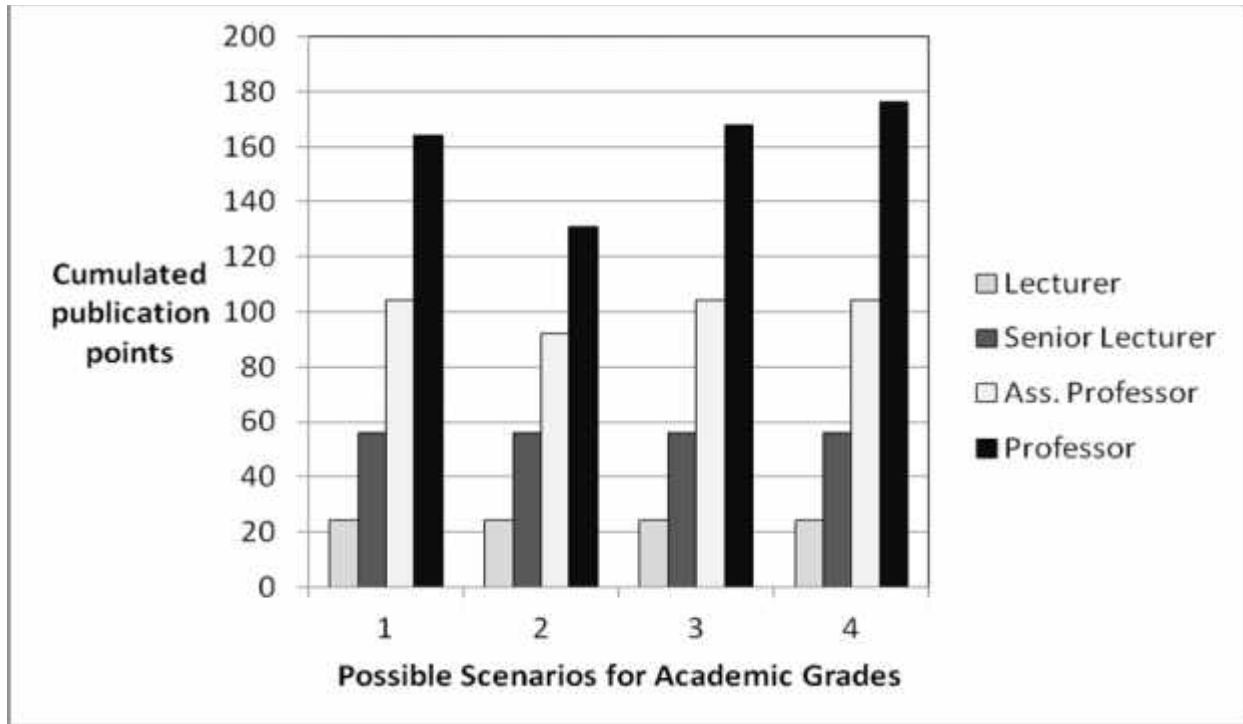
Figure 1. Cumulative publication points within university academic grades. Scenarios 1-3 are derived from the harmonised criteria (CUE 2014). Scenario 4 is the suggestion of authors after correcting the inconsistencies on associate professor and professor

Workload Distribution

According to Table 4, there is a contradiction between actual work load performances and expected weighted contribution as provided in the harmonised guidelines. For instance while a Professor is expected to spend 65% of his/her time in research and publications, the University allocates only 35% of his/her time for the same (i.e. 14 out of 40 hours per week). The same applies to an Associate Professor and all other cadres for persons not holding administrative responsibilities. Besides the statutory workload of 3 units per semester per teaching staff, the University still expects staff to take up extra teaching workloads from other programmes like open learning and Institution-based programmes. This pushes upwards the proportion allocated to teaching and instruction, while research and other core tasks suffer immensely.

It is paradoxical that during promotion in some public Universities, the same marginalised research is supposed to account for the largest proportion of weighted points.

Table 4

Relative weighted points for different cadres of academic staff

Area of Contribution (Tasks)	Prof	Ass. Prof	Senior Lecturer	Lecturer	Std. Workload (KU)
Research and Publications	65	60	50	40	35 (14)
Teaching and Instruction	15	20	25	30	60 (24*)
Professional consultancy/industry	10	10	10	0	0 (0)
Administrative Responsibility	5	5	10	20	5 (2)
Community engagement	5	5	5	10	0 (0)
Total	**100**	**100**	**100**	**100**	**100 (40)**

Source*: CUE Promotion Guidelines (except last column which shows Kenyatta University workloads per week in parenthesis (*) 10 hours of actual teaching and 14 for preparing to teach)*

According to the harmonised guidelines, Lecturers are supposed to participate in administration as opposed to other cadres. In practice however, the reverse is true. Professors who are expected to offer academic and research leadership tend to be appointed to clerical positions in top management, thus denying their mother departments critical academic expertise.

Similarly the guidelines expects Lecturers to have more community engagement, when their allocation for research and consultancies combined is the lowest, thus raising questions on the quality of community engagement expected from them. Strangely also the Lecturer is not expected to undertake professional consultancies and or industrial engagements, raising the concern as to whether a lecturer with consultancy evidence will be denied points, when under research and publications, this item carries 4 points.

Quality Teaching and Learning

In terms of quality of teaching and learning it is not clear in the guidelines how one could objectively rate lecture notes, student advising and mentoring. This will always be a challenge because at this level, students are supposed to be mature and take their own notes as lectures proceed. Further it is also plausible to assume that students who loath intensive individual

academic input are likely to underscore concerned lecturers when completing lecturer evaluation forms. Consequently there is need to development and implement a proper, tested, objective and proven criterion of measuring quality teaching and learning.

Community Engagement and Other Contributions

A challenge on this guideline is how to measure community engagement and other contributions. The tendency has been the requirement for academic staff to produce formal evidence when in most cases community service happens in very informal settings. It is therefore recommended that either all lecturers score the same on this item or it be deleted from the guidelines. Further provisions like "other guidelines to be developed by individual universities" are obvious loopholes that will be used to introduce non-academic variables to discriminate against the "unwanted" academic members of staff.

In terms of professional affiliations as a requirement, the paper questions the merit thereof because one could be a registered member of a professional body but totally absent and inactive. Unless this can be measured, the item should be deleted from the guidelines. Also the item on recognition, awards and honours would be a challenge because in Kenya where merit and hard work is criminalised, deserving persons are always victims of marginalization due to the process of awards being highly politicised. The guidelines should leave it at academic awards only.

Patents, Innovations and other Academic Achievements

While the maximum points to be earned from such items as patented Inventions or Innovations; consultancy and project reports and refereed exhibitions and performances are indicated, the maximum number of these performance indicators above which extra scoring may be necessary is not provided. As such scoring a person with 10 patented innovations equally with another who has one patented innovation is likely to discourage the drive for top performance. Although it is commendable for academic staff to be registered with relevant professional bodies, membership *per se* without evidence of active involvement in the functions of such professional bodies should not be a requirement in promotion.

Opening a Pandora's Box

Also the argument that in determining suitability for promotion individual universities may introduce other sub-categories is opening a Pandora's Box subject to abuse particularly in Kenya where standards are conveniently ignored in pursuit of private, sectarian, ethnic and unprofessional goals. Bearing in mind the enormity of past fraudulent promotions and the national cancer of corruption, this is a sure way of introducing mischief and thus encouraging an animal farm like scenario where different competences will attract the same promotion positions and hence compensation, depending on subjective opinion of the management. Subjective criteria that have been used in the past such as loyalty, supportiveness and personal friendship should never be used again.

Adjunct and Visiting Academic Staff

The appointment and promotion criteria establish the positions of Adjunct and Visiting Academic staff. While this is a good move and will help blend industry, research institutions and other relevant experiences, the threshold of 2 years of industrial experience is very low. Most consultants in other professions require a minimum of five years post qualification experience. It is thus the authors' considered opinion that a holder of a master's degree in the relevant field with 5 years of active industrial experience would make more sense. In addition, adjunct academic staff members should qualify academically on the harmonised criteria their professional experience notwithstanding.

As for the visiting academic staff, item (v) should be qualified to imply that visiting scholars particularly from other Universities will be vetted on the harmonized criteria and invited under the appropriate grades. This would eliminate academic fraud and impersonation, when people use titles they fraudulently obtained. Again it is worth noting that the position of external part-time lecturers is not mentioned anywhere in the appointment and promotion criteria established yet this is rampant in all universities in Kenya. It therefore deserves a mention.

Guidelines on the Transition Period

The effective date for implementing approved harmonized criteria was given as October 2014, being the date of approval by stakeholders during their meeting held at the Kenyatta International Convention Centre. As mentioned earlier, the greater majority of academic staff in public Universities was not aware of such a gathering. Had they known, their representative would have brought on board their views.

Although article 5 (iv) in CUE (2014) expects all existing staff who do not meet the minimum standards to work towards their attainment within 5 years (from the effective date, being 2014), the guidelines are silent on what should happen to staff who fail to meet these standards. Were an audit of all academic staff to be carried out in both public and private universities, including for persons in private sector and in state positions using these harmonised guidelines, a web of contradictions would be galore and a slur on the status and image of Universities and regulatory agencies.

If plagiarized PhDs are being recalled worldwide, Judges and police officers are being vetted in Kenya and imposters are stripped of their false positions, the precedent has been set upon which the Commission is duty bound and further based on morally in the public interest to vet all academic staff based on their cumulative points and rightfully place them. Avoiding such radical surgery would unfortunately communicate the message of self-preservation and thus give credence to the popularly held opinion that most people in top university policy and administration position are unlikely to meet the requirements of these harmonised guidelines. In the university there is no honour is carrying an academic grade that colleagues and peers know that one does not qualify to have.

Conclusions and Recommendations

There is no doubt that adherence to the harmonised promotion criteria will add a lot of value to the quality of academic service providers in Kenya. The guidelines offer a good start in re-claiming sanity and order in higher education across public and private universities. However in their current form they lend themselves to various loopholes that could be abused and thus defeat their envisaged goal. Accordingly, it is recommended that:

- There is need to maximise on stakeholder participation based on a bottom-up approach in seeking further input to enrich the guidelines. The final committee that would harmonise all collected views should be more representative and widely accepted by the key stakeholders that are to be served by the revised guidelines.

- For not providing academic staff equal opportunities, administrative positions should not attract any points in the promotion guidelines

- All items that attract points must be specified quantitatively and proportionately as a way for rewarding top achievers.

- Being subjective in their nature, student evaluations of lecturers should not attract any points in promotion, unless fair and a tested criterion is developed.

- Weighted publication points should encourage inter-disciplinary and multi-disciplinary research while at the same time discouraging joy-riding. To do this, authors should be expected to indicate their percentage contributions in any publication for use in sharing points. The Percent Contribution Indicator model stands out as the preferred approach.

- No room should be given to University Authorities to introduce "other" criteria that may not be academic and measurable. All items that attract points must be measurable with academic staff having equal opportunity to indulge in them.

- To reclaim the honour of merit and professional mutual respect, all academic staff regardless of their current grade should be vetted on a cumulative score based on a revised criteria and be placed where they rightfully belong. This way a message will be passed that corruption does not pay.

- Councils that have in the past violated standards and best practices, thus defaming Universities through corrupt appointments and promotions should be singled-out for accountability in-line with constitutional requirements in chapter 6 article 73 (1) on leadership and integrity.

- With such high requirements for promotion within academic grades, any purported "equivalents" to academic staff must be persons who have equivalent qualifications/professional, and can perform the same duties as the academic staff if called upon. Anything on the contrary would represent academic and professional fraud that has been prevalent in the past.

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Building the University Sector of the Future: Experiences from Kenya

Eusebius Mukhwana, Jackson Too & Alice Kande

Abstract

Kenya has attached great interest in education as a stimulant for economic and social development since 1963. Higher education evolution in Kenya has been rapid and increased demand and pressure from the public has led to calls for innovative, adaptive and futuristic universities. Given the progressive growth of the sector, a number of measures have been and continue to be enforced by the Government and its agencies to ensure that universities comply and deliver on their mandates of teaching, research and community engagement. Prior to 2013, public universities were autonomous in their management having been created under their own Acts of Parliament; whereas the then Commission for Higher Education (CHE) only accredited and regulated private universities. While lauded for complying with universal principles to create independent and "thinking" universities, the autonomy was abused, and little attention was paid to quality. The universities opened large numbers of campuses across the country, launched many programs for which they neither had capacity nor resources and neglected support to post graduate training, research and outreach. Though the Commission for University Education (CUE) is mandated to regulate, coordinate and assure quality in both private and public universities in the country, the rapid expansion of the university sector has raised concerns on relevance, sustainability and the future of the sector. Informed by the recent reforms within the university sector, existing literature and recent studies conducted by CUE, this paper highlights some of the key emerging issues that play a significant role in shaping the university sector. Further it makes recommendations on strategic ways to build a resilient, vibrant and sustainable university education sector for the country.

Key words: Education, Quality, Equity, Relevance, Competitiveness

Introduction

In a knowledge economy, universities are considered the most important conduits for generating preserving, disseminating, and transforming knowledge into wider social and economic benefits (McCowan, 2009). While university expansion is a global phenomenon, the globalization process and growth of the knowledge economy which depended heavily on Information Technology and highly trained personnel necessitated rapid expansion and growth of university sector in 1990s across Africa (Bloom, Canning, & Chan, 2006) signaling that nations had embraced the need for investing in higher education. In reiterating the need for university sector in the region, the UN Secretary General Kofi Annan stated that:

"The university must become a primary tool for Africa's development in the new century. Universities can help develop African expertise; they can enhance the analysis of African problems; strengthen domestic institutions; serve as a model environment for the practice of good governance, conflict resolution and respect for human rights, and enable African academics to play an active part in the global community of scholars" (United Nations Information Service, 2000).

The State of Higher Education in Africa report (2015) indicates that at 21% return on Investment, Africa receives the highest returns in the world from investing in higher education. This is despite the fact that only 6% of the young people in Sub-Saharan Africa are enrolled in higher education institutions compared to the global average of 26 percent. The promising news is that universities in many African countries are still experiencing a surge in enrolment given that between 2000 and 2010, higher education enrolment more than doubled, increasing from 2.3 million to 5.2 million. In Kenya, the changes in the 1990s necessitated diversification of funding and institutional arrangements for provision of university education became necessary. To supplement the then insufficient capitation by the Government, public universities introduced module II programmes while the need to increase access to higher education opened doors to establishment of private universities.

With the apparent support by the Government to increase access at all levels of the sector, the Kenya National Economic Survey of 2016 indicated that the education sector was among the key sectors that drove the economy making a contribution of 5.0% of GDP (KNBS, 2016). This

coupled with affirmative action activities that encouraged people living with disability, women and students from marginalized communities to access university education, has meant that student enrolment has continued to grow rapidly. This however, has not been matched with investments in physical, human and financial resources to support the sector (CUE, 2014). While the exponential growth of the university sector is applauded, of critical importance is the sustenance of quality university education to ensure that universities continually deliver on their mandate of producing qualified graduates capable of fitting in the highly dynamic industry and agile enough to embrace the changes in the future.

Objective

The general objective of the study was to determine the significant issues in the university sector that impact on the sectors sustainable future.

Methodology

The study used purely secondary data to address the objective. Data was obtained from documented sources at the Commission for University Education (CUE). Extensive references were made to data contained in the book*: The State of University Education in Kenya (CUE, 2016)* published by the Commission. Library and Internet search was undertaken to get current and relevant literature.

Background of the University Sector in Kenya

Higher Education in Kenya has gone through a trajectory dating back in 1922 when the then Makerere College in Uganda was established as a small technical college which was then expanded to meet the needs of the three East African countries; Kenya, Uganda and Tanganyika/ Tanzania, as well as Zambia and Malawi. In the 1940s and early 1950s it was only Makerere College that was providing university education in East Africa. This lasted until 1956 when the Royal Technical College was established in Nairobi. In 1963, the Royal Technical College became the University College, Nairobi, following the establishment of the University of East Africa with three colleges which offered programmes and degrees of the University of London till 1966.

In 1970, the University of East Africa was dissolved to create three autonomous universities; University of Nairobi, Dar es Salaam and Makerere. The University of Nairobi was thus established as the first university in Kenya. Four decades later, the sector has expansively grown to a total of seventy (70) universities - thirty eight (38) privately established and thirty two (32) public universities (CUE, 2015), an unmatched growth in the African region besides that of the Republic of South Africa. This has been largely attributed to the liberalization of the higher education industry, the increasing number of secondary school graduates qualifying to join universities annually as well as the evidently growing population. The recognition of the key contribution of Education to attainment of the country's vision (Kenya Vision 2030) has also seen the sector receive commendable and increasing support from the Government such as increase in the amount of funds allocated for research as well as the placement of Government funded students in private universities, a move that resonated well with the national effort to expand access in higher education sector.

Status of University Education in Kenya – Enrolment and Graduation Rates

The expansive growth of the university sub sector in the country led to the need for establishment of the Commission for University Education (CUE) to regulate, coordinate and assure quality in the university education. CUE is mandated to ensure standards, quality, and relevance in all aspects of university education, training, research and community engagement. The Commission mainstreams quality assurance practices and encourages continuous improvement in the management of the sub sector. To perform its mandate, CUE collects data on regular basis from all the universities which is then used to generate policies and advisories relating to university education. For the purpose of addressing the objective of this write-up, the authors extensively referred to data on enrolment, graduation and publications.

Enrolment

That student enrolment in Kenyan universities has exponentially grown is indisputable. A recent study by CUE observed that student population in universities had increased from 195,428 in 2012 to 539, 749 in 2015 (Table 1). This depicted a 36 % increase in only three years. Of the total student enrolment in the year 2015, 90% were in public universities, while 10% were in private universities (CUE, 2016).

Table 1

Student Enrolment by Gender in Public and Private Universities

Universities	Postgraduate Diploma		Bachelor		Master		PhD		Grand Total
	Male	Female	Male	Female	Male	Female	Male	Female	
Public Universities	668	300	245,849	163,373	27,407	18,164	4,231	1828	461,820
Private Universities	272	152	32,663	33,865	5,505	4,385	684	403	77,929
Total	**940**	**452**	**278,512**	**197,238**	**32,912**	**22,549**	**4,915**	**2,231**	**539,749**

Source: (CUE, 2016)

The enrolment in the universities in Kenya is expected to soar even more and while this is a good reason to cheer, the preparedness of the universities by ensuring that they have qualified lecturers, instructional materials, and supportive infrastructure development have not kept pace with the heavy demand (Basheka, 2008; Gudo et al., 2011; Otara, 2012). Rising enrolment rates have drastically outpaced an increase in education funding, resulting in shortages of instructional materials and supplies, poorly stocked libraries and overuse of school facilities. Indeed, while more students are in school classrooms, there is a deeper learning crisis at play: many students are not gaining basic skills while attending school.

For an economy that pegs its future development on knowledge, the feedback from the industry and other stakeholders on inadequacy of the universities to fully deliver on their mandate is a great undoing.

Graduation Trends and Graduate Employability

It is widely recognized that long-term economic growth can only be achieved through investing in and producing highly skilled workforce. In the context of the knowledge economy, higher education has become particularly critical where universities are considered the most important mechanism for generating, preserving, disseminating, and transforming knowledge into wider social and economic benefits (AAI, 2015).

Kenya, through the 2010 Constitution and Vision 2030 affirms its support to enhancing higher education and training which is considered a critical part of the roadmap towards the actualization of the social transformation of the country (MOE, 2013). The country has generally been on the right track given the progressive increase in the number of students graduating from the universities, however, responsibility for the university education sector is to be able to meet the human resource requirements for a rapidly changing and more diverse economy.

With the increasing enrolments over the years, graduation trends in the country has soared extensively. However, as indicated in Table 2, the graduation rate does not match the high rate of enrolment and while the low graduation Figure could be attributed to many factors such as availability of funds, the status could also be partly attributed to students seeking alternative and more fulfilling ways to pursue their purpose in life as the Universities fail to deliver on their mission of transforming minds and the society through teaching, training, research and community development.

Table 2

Graduation Rates in Public and Private Universities (2012 – 2015)

Prog Levels	2012		2013		2014		2015		Total		Grand Total
	M	F	M	F	M	F	M	F	M	F	
Bachelor	17,412	14,311	21,537	18,628	28,986	23,783	32,995	27,866	100,930	84,588	185,518
PGD	336	244	507	304	1282	853	858	568	2983	1,969	4,952
Masters	2,415	1,932	2,949	2,340	4,022	3,248	4,865	3,726	14,251	11,246	25,497
PhD	134	63	167	102	268	159	295	174	864	498	1,362
Total	**20,297**	**16,550**	**25,160**	**21,374**	**34,558**	**28,043**	**39,013**	**32,334**	**119,028**	**98,301**	**217,329**

Source: (CUE, 2016)

The status of university education in Kenya indicates a progressive increase of 16% in the number of those who graduated between the year 2012 and 2015. While the output by the universities is evidently commendable, the Figures indicated that graduation rates at post graduate levels were quite low with only 0.6% and 11.7 % graduating at PhD and masters levels respectively in the year 2015. Given that the nation relies heavily on the university sector to drive the social and the economic pillar of Kenya Vision 2030, the country then currently operates in a precarious situation as the impact of university education may not be felt as much.

While the number of graduating students at undergraduate level has been soaring, there is widespread concern about the work readiness of graduates. Existing literature (AAI, 2015; Gudo et al., 2011) and anecdotal reports have indicated severe mismatch between the skills of young graduates and the skills that employers need for today's global workforce. While employers are generally satisfied with the disciplinary knowledge of students, they perceive significant gaps in their IT skills, personal qualities for instance reliability and transferable skills for instance team working and problem solving skills.

The observation on graduate employability is however not a Kenyan only situation. A report on graduate employability in Sub - Saharan Africa by McCowan (2009) indicates that despite the rapid expansion of higher education enrolments resulting to high number of graduates, there are serious concerns about the ability of universities to produce globally competitive graduates. This then implies that for the universities to proof their relevance and assure their sustainability into the future, there is need to redefine their purpose and ensure that they are in tandem with the industry needs. A university of the future should emphasize on producing employable graduates within the globalized market rationality.

Significant issues that influence and shape the future of universities

A world-class university can be characterized by the critical success factors it exhibits, including high concentration or critical mass of talent (both faculty and students); availability of sufficient resources to provide an extensive, comprehensive learning environment and a rich environment for advanced research; favorable governance allowing and encouraging autonomy, strategic vision, innovation; efficient resource management and flexibility (Bloom, Canning, & Chan, 2006). Drawing from existing literature and recent studies conducted by Commission for University Education, this paper highlights some of the key emerging issues that play a significant role in shaping the university sector and that impact on the universities sustainable future.

Access and equity in University education

University access has to do with enabling the admittance of a broader range of learners into higher education than are conventionally incorporated (Mulongo, 2013). This involves facilitating substantial number of candidates, especially drawn from marginalized categories (such as the poor, historically sidelined regions or tribal subgroups) to attain/access higher education. During the past decade enrolment in both public and private universities in Kenya has been characterized by rapid expansion (CUE, 2016). Patterns of access to both public and private universities tend to reflect increasing regional, gender and socio-economic differentiation in the Country. Commendable effort has been expended to ensure and promote expansion to satisfy the demand for university places of the growing population. This has been supported by putting in place and implementing policies to provide incentives and creating an enabling learning environment. For instance, in 2016 a total of 12,096 Government sponsored students were placed in private universities. This was applauded as a move in the right direction to enhance access in university education and to provide chances for more students to pursue courses of their choice.

The country has also put measures and developed policies to ensure that universities enroll and graduate sufficient post graduate students who are not only expected to make a great contribution through impact research but also for posterity of the growing university sector. As the country inches closer to the year 2030, there has been a lot of emphasis on the need to address issues related to access, equity and management of university education. Generally, access to university education in Kenya has expanded remarkably; providing more choices and varied modes of delivery (Otara, 2012). These gains could further be enhanced through introduction of Open, Distance and E-Learning (ODEL) to provide more study opportunities.

Quality and Relevance of University Education

Despite the rapid growth of the university sector as depicted by increased enrolments and number of graduates from the universities, the issue of failure to adhere with quality standards is a global as well as regional phenomenon (Bloom, Canning, & Chan, 2006). In Kenya, the current unprecedented expansion of universities, though in line with the country's development goal, has also been frequented by complaints about compromising the quality of education (Odhiambo, 2014) as well as failing to address the market demands (Gudo, Olel, & Oanda, 2011).

Odhiambo (2014) opines that Universities in Kenya have failed to clearly articulate their missions that stipulate, in no vague terms, the kind of graduates that they wish their education systems could produce. As the country aims at creating an adaptable human resource base that is relevant to the dynamic labour market, there is therefore need for a paradigm shift to ensure that the education provided meets high quality standards, and that its contents are relevant to the needs of the economy and society. This might require the universities to rethink their mission and ensure clear articulation and alignment of among others, their key functions of teaching, research and community engagement as well as ensuring total compliance with existing standards and regulations as stipulated by Commission for University Education.

To keep pace with the current dynamic global trends in higher learning, the university sector in Kenya needs to foster relevance by ensuring support for multidisciplinary learning to improve the current heavily skewed concentration by majority of the universities on Humanities and Arts as opposed to Science based courses (CUE, 2016). As provided Table 3 on graduation per cluster, it is evident that Kenya is not producing enough human resource in Science, Technology, Engineering and Mathematics (STEM), an area that is very critical if the country is to attain the aspired development stipulated in the national development blue print. The 2016 report by CUE as seen in Table 3 indicates that only 13% of graduates were in STEM courses.

Table 3

Graduation Trends per Cluster in Public and Private Universities in Kenya

Clusters	Public Universities			Private Universities			Total			Proportion
	M	F	T	M	F	T	M	F	T	
Agriculture, Forestry and Fisheries	3,339	2,042	5,381	265	131	396	3,604	2,173	5,777	2.7%
Architecture	926	357	1,283	0	0	0	926	357	1,283	0.6%
Business and administration	22,748	16,669	39,417	13,175	14,827	28,002	35,923	31,496	67,419	31.0%
Computing	4,255	1,527	5,782	3,730	1,912	5,642	7,985	3,439	11,424	5.3%
Education (Arts)	12,826	11,309	24,135	6,388	8,594	14,982	19,214	19,903	39,117	18.0%
Education (Science)	3,950	2,183	6,133	1,630	994	2,624	5,580	3,177	8,757	4.0%
Engineering	6,209	1,364	7,573	31	6	37	6,240	1,370	7,610	3.5%
Environment	1,978	1,253	3,231	40	66	106	2,018	1,319	3,337	1.5%
Health and Welfare	4,397	3,909	8,306	2,221	2,465	4,686	6,618	6,374	12,992	6.0%
Humanities and Arts	6,877	6,926	13,803	2,502	1,641	4,143	9,379	8,567	17,946	8.3%
Journalism and Information	1,626	1,687	3,313	633	1,433	2,066	2,259	3,120	5,379	2.5%
Law	1,642	1,564	3,206	858	990	1,848	2,500	2,554	5,054	2.3%
Life Science and Physical Science	4,968	3,054	8,022	25	46	71	4,993	3,100	8,093	3.7%
Manufacturing	221	58	279	0	0	0	221	58	279	0.1%
Mathematics and Statistics	2,336	1,239	3,575	89	122	211	2,425	1,361	3,786	1.7%
Security and Conflict Resolution	1,354	584	1,938	109	100	209	1,463	684	2,147	1.0%
Services	743	862	1,605	65	139	204	808	1,001	1,809	0.8%
Social and Behavioral Science	2,373	1,949	4,322	1,053	2,214	3,267	3,426	4,163	7,589	3.5%
Teacher Training	812	930	1,742	817	1,527	2,344	1,629	2,457	4,086	1.9%
Veterinary	146	56	202	0	0	0	146	56	202	0.1%
Other	10	4	14	1,661	1,568	3,229	1,671	1,572	3,243	1.5%
Total	**83,736**	**59,526**	**143,262**	**35,292**	**38,775**	**74,067**	**119,028**	**98,301**	**217,329**	**100.0%**

Source: (CUE, 2016)

While there is an acute shortage of manpower in the engineering, ICT, science and medical fields, Universities are training students mostly in Business, Arts and humanities, who constitute 74% of all students enrolled. Yet the national agenda emphasize more on skills in medicine, pharmacy, engineering and technical-based programmes (STEM) as key requirements for the country to grow and attain its development aspirations. The prevailing situation in which the Humanities courses dominate the total student enrolment in universities seems to be holding back the achievement of this vision.

Governance and Leadership of Universities

There has been a move towards greater autonomy of the universities in the management of their internal affairs in Kenya (Odhiambo, 2014). With all universities now governed by the Universities Act, operations of the sector have been harmonized leading to an improvement in the previously segregated mode of running the universities. The competitive recruitment process of Vice chancellors and other senior managers, for instance, that is currently in place is quite commendable and should be protected as it is transparent, accountable and meritocratic (GOK, 2012). While the new law has addressed this by setting out clear organs of managing universities and their roles and responsibilities, the country is yet to see the outcome of proper utilization and implementation of the stipulated guidelines as far as steering universities growth is concerned.

A major challenge which has bedeviled the sector has been the process of appointing Members of the Councils/Boards of these institutions (Odhiambo, 2014**).** For quite a while, there were no clear guidelines for this process as it was left to the discretion of the Minister of Education and the Head of State (GOK, 2012). This created a lacuna where the political elite and others with vested interests nominated their cronies. The result was appointment of persons with little or no experience in University management and administration who failed to steer the institutions in the right direction. Gudo et al., (2011) opines that the universities that succeed best are likely to be those with strong leadership that has the confidence to challenge vested interests.

Research, Innovation and Community Service

Recent evidence as indicated in Figure 1 reveals that research productivity in Kenya is quite low compared to other countries in Africa, such as South Africa, Egypt, Nigeria and Algeria and the little that is done is largely academic that does not benefit the end users (CUE, 2016). While universities are required to play their three crucial roles of teaching, research and outreach, regulations by the CUE have only tended to emphasize teaching at the expense of these other roles (University Standards and Guidelines, 2014). Previous interrogation has indicated a number of factors that have greatly contributed to low research activities such as insufficient funding, limited time for university academic staff as they focus more in teaching at the expense of researching, lack of research infrastructure, lack of clear research focus, misinformed priorities for universities as well as poor absorption and use of research (Odhiambo, 2014). Figure 1 shows the number of publications produced in the country in peer reviewed journals from 1996 until 2014, while Figure 2 shows publications per program during the same period.
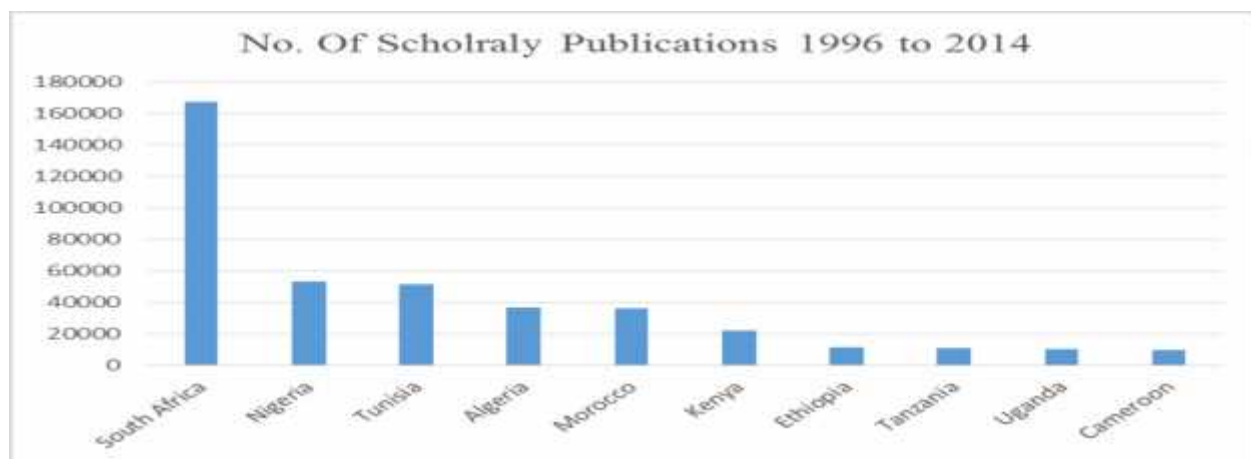
Figure 1. Publications from Kenya, 1996 to 2014   Source: (CUE, 2016)

Absorption of existing research funds has been less than optimal, which is cited as a major hindrance to impactful research by universities (Otara, 2012). However, as established in the ST&I Act of 2013 and with the establishment of the National Research Fund, funding allocation to university research is expected to rise if the Government meets its commitment of 2% of the country's Gross Domestic Product to facilitate research and innovation in all fields of Science and Technology for the growing economy (NRF, 2016).
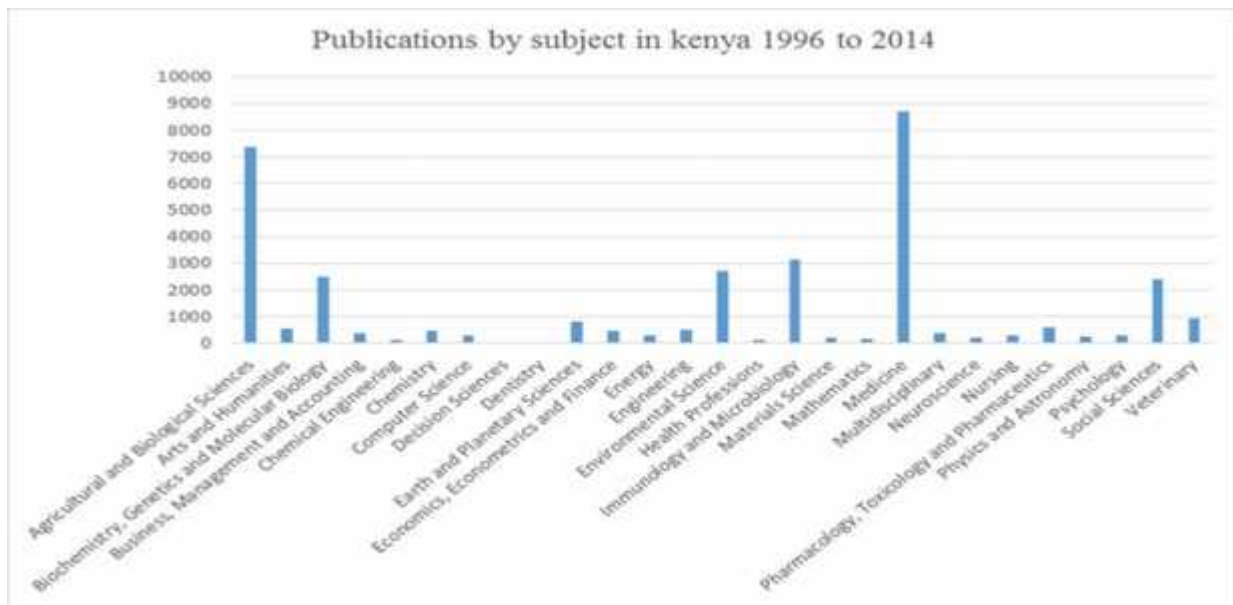
Figure 2. Publication by subject   Source: (CUE, 2016).

The current situation in higher education is worrying as little has been done to tap the latent pool of creative initiatives and research outputs for economic use to transform lives. There is an abysmal dearth of knowledge on how to use research findings to catalyze innovation to make life easier or mitigate everyday life problems (McCowan, 2009). Related to this is the issue of Intellectual Property Rights, an area that players in the University Education sector have little knowledge about, on how to have their products evaluated and secured through patents. (KIPI, 2015). A report by KIPI on enhancing Intellectual Property awareness in the country indicated that the country has great potential to harness innovations but unfortunately local research centers, innovation hubs and higher education institutions do not utilize the available opportunities to innovate. To build resilience, universities are expected to be at the forefront embracing research and innovation if they are to play their expected role in driving the national development agenda.

Linkages with TVET sector

Kenya Vision 2030 places great emphasis on the link between Education, Training and the labor market as well as the need to create entrepreneurial skills and competencies and strong public and private partnerships (MOE, 2013). Among the key players mandated to drive the socio-economic and technological transformation agenda is the Technical and Vocational Education and Training Authority (TVETA) considering their contribution towards producing globally competent and sustainable human capital.

Despite the critical role that TVET plays in contributing to national development, the Sector Performance Standards report of 2015 pointed out some of the major challenges that the sector faces including low student enrolment fueled by negative perception about TVET by parents and potential students, lack of dynamism in the curricular, obsolete technology, poor funding and an apparent bias for degree programmes (Sector Perfomance Standards, 2015). The sector is also faulted for lack of a clear career path for a long time that tended to discourage many potential students and made universities to usurp the mandate of TVET institutions by mounting diploma and other tertiary courses.

The absence of strong Government support, lack of leading TVET champions and apparent apathy from the general public led to a number of TVET Institutions being elevated to Universities (Ndunda, 2016) despite the lack of sufficient resources. The dire consequences of elevation of TVET institutions to universities however called for Government attention and action and by 2016, the Government had built 70 TVET institutions while 87 more were under construction to meet the increased demand for mid-level manpower training programmes (TVETA, 2016).

University and the TVET sectors contribution towards national sustainable development can only be attained through leveraging on each of the sectors strengths as per their mandates unlike engaging in unhealthy competition that makes the institutions lose focus and relevance. Similarly, as the key definers of the skills needs of the economy and the key beneficiaries of the skilled workers produced by universities, the industry plays a crucial role in developing the university sector (Bloom, Canning, & Chan, 2006).

The industry should tap the resources available in universities more effectively, while the universities should become more flexible in meeting the industry needs.

Postgraduate Research and Training

Postgraduate qualifications are increasingly a necessity for careers in the public and private sectors alike (Basheka, 2008). A forward looking nation is expected to strengthen the flow of skills at the highest level into key sectors of the economy as well as ensure preparedness of tomorrow's leading academics for posterity of the higher education sector.

The low enrolments rates and the subsequent low graduation rates at the post graduate level as observed in Tables 1 & 2 indicates that the country falls short of producing a critical component of driving the national development agenda while the sufficiency of universities future academic leaders may be at bleak. A 2016 report on post graduate research and training in Kenya indicated that while the expansion of undergraduate access to university education is receiving increasing attention, universities are not allocating adequate resources to the development of postgraduate programmes (Too, 2016). In 2015 for instance, university statistics indicate that graduate enrolment stood at approximately 11.9% of the student population up from 10% in 2014, a situation that is deemed to be insufficient in view of the country's current and future needs (CUE, 2016). Drawing from success stories from the West, a university of the future is expected to strengthen its post graduate training, research capacity and innovativeness while ensuring that the outcomes are translated into economic impact (Tam & Thompson, 2012).

Internationalization of Education

Higher education globally has experienced dramatic changes in recent years. There is no doubt that it should be viewed in the global context and not solely from a domestic point of view. The presence of international students is now a core part of the student body for the world's leading universities (International Trends in Higher Education, 2015). According to a report on the future of Higher Education, Internationalization is no longer just about the mobility of students and signing of international memoranda of understanding, but also pertinent aspects such as internationalization of curriculum, internationalization of research, offering of dual degrees with foreign partners, establishing of branch campuses abroad, involvement of international

alumni, creation of international quality assurance frameworks, proliferation of international rankings and increased competition for international students in a globally interconnected world (Francisco, 2011). The university sector in Kenya has been applauded for making efforts to open doors to international students as well as enhancing collaborative links with international bodies (Otieno, 2012), however, the sector still falls short of meeting the global competitiveness as far as internationalization is concerned as observed in the recent study on the status on university education in Kenya (CUE, 2016).

Conclusion

Many nations are investing in university education, seeing that the higher level skills of graduates and the social and economic benefits of research are central to an advanced 21ˢᵗ century society. The role of the university is no longer seen as uniquely being an institution for the personal development of its students. Increasingly, there is an expectation on universities to engage with the local communities in which they exist and to help the socially-excluded to adapt to the demands of the knowledge economy. Universities that are engaged with businesses and the local community are vital in driving economic and social prosperity both for the region in which they sit and beyond. The Kenyan University sector, like any other globally, must work tirelessly to obtain and maintain its international standing and contribution in the knowledge economy. While the enrolment trend continues to go up, the universities will require a sustainable strategy to ensure that as the world becomes more technological, the institutions evolve to provide the right education and training for jobs in today's workforce in readiness for the future expectations (Basheka, 2008).

Thus, to meet the demands of competitiveness in the 21ˢᵗ century and of the future, universities must work in smarter and more innovative ways. The University sector of the future must be agile enough to embrace the multiplicity of the dynamics in the sector.

Recommendations

While there have been policy and legal reforms within the Kenyan university sector, these are yet to bear fruits. There is need for more efforts and dialogue in order to create world class universities of the future in the local setting. Of critical importance is to implement the proposed

Differentiated Unit Cost (DUC) funding system to develop and support education programmes that deliver strategic skills needed in the country. This will mean enhanced support to the programmes that support development of the key sectors identified in the national development blue print, as well as other skills that will underwrite the country's competitive advantages as stipulated in Kenya Vision 2030. However, whereas Government capitation is important, it is critical to note that in the current circumstances, getting sufficient funding through public expenditure alone will be extremely difficult. It is therefore important for universities to develop diverse set of funding streams if the quality of higher education is to be maintained and improved. Universities should endeavor to engage in more local and international partnerships so as to enhance their long term ability to compete. Ensuring the long-term sustainability of our universities and growing their reputation will lead to greater partnership potential.

Generally, universities should put mechanisms in place to ensure that graduates are equipped with required skills, as opposed to academic qualifications devoid of competency. The university sector in Kenya should be responsive to the demands of both undergraduate and postgraduate training, embedded and integrated in a wider education and skills framework and capable of equipping all students with the capabilities and confidence to prosper - This is an absolute priority for posterity of the university sector.

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Towards Becoming an Industrialized Middle-Income Country: Recasting the Focus
Jackson Too, Muriithi Njeru and Claris Adoyo

Abstract

The level of enrolment and staff in Science, Technology, Engineering and Mathematics (STEM) in Africa still remains low despite the efforts by Government and other interest groups. Yet these are the subjects, which would catapult the continent to greater heights of development. The disconnect between public policy statements and what is obtained on the ground is quite worrying. The situation on enrolment and teaching at university level in Kenya, best exemplifies the sorry picture of these subjects in Africa. A survey conducted in both public and private universities in Kenya reveal depressing statistics: out of 539,749 students enrolled in all universities in Kenya, less than 5% are enrolled in science-related courses namely: Agriculture, Forestry and Fisheries; Mathematics and Statistics; Engineering; Manufacturing; Architecture; Education Science, Veterinary and Environment. In contrast, Humanities and Arts; Business and Administration; Education Arts and Social Health studies have all their enrolments surpassing 10%. Data obtained for staffing for these courses shows a corresponding pattern where the academic staff for science and technology courses are very few. This scenario negates all efforts that have been claimed to promote the teaching and learning of these disciplines in higher education. The conclusion drawn from these findings is that there is a need to review the existing policies, curriculum and pedagogy, entry requirements, learning equipment, staffing, infrastructure, and the funding model of STEM in Kenya.

Key Words: Curriculum; Enrolment; Pedagogy; Staffing; Technology

Introduction

The evolution of technology over the years and the impact it has made on every facet of our lives has been quite fascinating and amazing (Matos, 2008). The impact of science and technology, particularly the Information Technology (IT) in the 20th Century has been very significant (Tettey, 2006). It is the realization of what science and technology can do that has shaped the thinking of policy makers in different parts of the world. The achievement of Russian State by sending man into the outer space using a spacecraft in early 60s, jolted the American Nation into researching intensely; culminating in their putting the first man in the moon in 1969.

Over the years relentless effort and resources have been put to Science, Technology, Engineering and Mathematics (STEM). This effort has been evident in the school curricula and training at all levels. In Africa, there has been more talk about Science and Technology, but little has been achieved over the years. Apart from the M-Pesa innovation that has been acclaimed worldwide for having revolutionized paperless transaction of money and transformed lives; there is no other well-known tangible product or innovation that Africa can proudly celebrate as her great achievement.

The African Union envisions that Africa will achieve an innovation led economy by 2024 and has put forward the Science, Technology and Innovation Strategy for Africa(STISA-2024) to foster social transformation and economic competitiveness, through human capital development, innovation, value addition, industrialization and entrepreneurship. The African Heads of States have yet an opportunity to back their commitment towards this regional agenda by implementing their national socioeconomic plans.

The Kenyan Government's blue print—Vision 2030—at its core articulates the need to emphasize science and technology courses to help the country transform into "a newly industrialized, middle-income country providing a high quality life to all its citizens by the year 2030 (Republic of Kenya, 2013). Yet even this long-term vision fails to outline substantive measures taken to address pre-existing issues already affecting the system and to delineate a framework that lays out a clear path on how to get there by 2030.

What is clear is that Kenya's public higher education sector requires reforms for it to play a catalytic role in transitioning Kenya from a subsistence economy towards a knowledge economy. In Kenya, researchers and curriculum experts have made tremendous efforts to influence the Government to commit more resources to science and technology. To some extent the Government has made strides to meet those needs; however the results of those endeavours have not been felt.

Objectives

The objectives of the survey were as follows:

i.   To determine the number of students enrolled in science and technology programmes in the university;

ii.   To establish the ratio of staff to students in the science and technology based programmes in the university;

iii.   To analyze the impact of the type of programmes on offer in universities and the number of students enrolled on realization of national priorities.

Literature Review

A look at the experiences of newly industrialized countries reveals that they have struggled with problems similar to Kenya's current challenges including poor infrastructure, low GDP, and low levels of funding for academic research (Johnson, 2002; Mazzoleni, 2008). But remarkable economic growth and tremendous success of Brazil, China, Korea, and Taiwan was underpinned and enhanced greatly by critical investments in a number of areas including: reforms focused at modernizing institutions of higher education; policies supportive of STEM fields; aggressive collaborative investments in academic research (R&D) by both Governments and the private sector and clear links between higher education and the economy at both conceptual and policy levels.

Specifically, investments in higher education focused on rapid expansion of university systems, increased enrolments in general and specifically in STEM education, funding the development of public research laboratories, funding research activities collaboratively with the private sector and creating incentives to encourage foreign-based scientists to return and reverse brain-drain

(Gardner, 2011; Johnson, 2002; Mazzoleni, 2008). This mix of initiatives resulted in the creation of a large, skilled talent pool that continues to drive research production, technological capabilities and ultimately economic growth in these countries.

Partnerships between universities, industry, and Government have proved useful to enhancing economic growth and competitiveness both in post-industrial economies of the West and in newly industrialized economies of the East (Douglass, 2009). Compelling empirical evidence of the vast potential and immense benefits of these collaborations is visible in the United States of America where the federal Government and industry invest billions of dollars in cutting-edge research programs at leading research universities spread out across the country including in California (Silicon Valley), Massachusetts (Kendal Square), and in Texas (Austin Area) (Douglass, 2009; King, 2009).

Similar kinds of research-focused collaborations are visible across Europe and in parts of Asia - China, Taiwan, Singapore (Etzkowitz & Zhou, 2009; Lin, 2009). In Taiwan, for instance, university-industry-Government collaborations led to the creation of innovative technologies that played a major role in transitioning that country's agrarian economy of the 1950's to the modern knowledge-based economy where economic activity is driven by explosive growth in demand for and sales of electronics worldwide (Johnson, 2002; Lin, 2009). Kenya's Konza techno-city project needs to be fast-tracked if the country is to be taken seriously as developing.

Methodology

This paper is based on a survey of all universities in Kenya. The data collected from both public and private universities covered various variables in the university such as enrolment, staffing, programmes, staff qualification, graduation trends and enrolment of students with disabilities.

The design of the data collection process was quantitative. The target population included students and academic staff in all public and private universities in Kenya. The sampling design used was a saturated census in which all the cases were considered. Data was collected over a period of six months from all the 68 public and private universities licensed to operate in Kenya at the time of data collection. A closed-ended questionnaire was used to capture enrolment of

students in public and private universities disaggregated by gender and academic level. For academic staff, gender, academic qualification, establishment and tenure (i.e. whether full time or part time) were captured in the tool.

In order to secure the validity and usability of the questionnaire, it was subjected to two validation workshops. The university representatives were taken through the tool to be familiar with each item and to seek clarification where there was ambiguity. The intense discussions, which followed, contributed significantly to the improvement of the tool. Filled questionnaires were sent through the email. Universities, which delayed in sending the questionnaires, were tracked and phone calls made. Questionnaires, which were not duly filled were sent back and the persons concerned in the university asked to complete them fully.

Findings

All the questionnaires received from universities were collated and entered into one main excel sheet. Data was extracted from the excel sheet and analyzed according to the following variables: university programmes, student enrolments, staff qualifications and establishments. Descriptive statistics, which included frequency tables, percentages, ratios, charts and graphs were used to analyze data. These were then compiled into one document.

Programmes in Public and Private Universities

Humanities and Arts cluster had the highest proportion of programmes across the universities at 14%, followed by Business and Administration and teacher training at 11.1%, Life Science and Physical Science programmes as well as Agriculture, Forestry and Fisheries with 10.7% each. On the other hand, the least represented clusters were Manufacturing, Law, Architecture and Veterinary. Table 1 gives a summary of the number of programmes per cluster in both public and private universities.

Table 1

Programmes per cluster in Private and Public Universities

Cluster	Public Universities	Private Universities	Total	Proportion
Agriculture, Forestry and Fisheries	354	9	363	10.7%
Architecture	26	0	26	0.8%
Business and Administration	268	117	385	11.3%
Computing	109	54	163	4.8%
Education (Arts)	219	68	287	8.4%
Education (Science)	50	6	56	1.6%
Engineering	138	7	145	4.3%
Environment	126	8	134	3.9%
Health and Welfare	244	60	304	8.9%
Humanities and Arts	326	149	475	13.9%
Journalism and Information	69	16	85	2.5%
Law	6	7	13	0.4%
Life Science and Physical Science	352	13	365	10.7%
Manufacturing	10	1	11	0.3%
Mathematics and Statistics	127	13	140	4.1%
Security and Conflict Resolution	41	9	50	1.5%
Services	59	12	71	2.1%
Social and Behavioral Science	120	57	177	5.2%
Teacher Training	65	29	94	2.8%
Veterinary	31	1	32	0.9%
Other	13	19	32	0.9%
Total	**2,753**	**655**	**3,408**	**100.0%**

CUE Data, 2016

Enrolment per Cluster in Public Chartered Universities

In Public Chartered Universities at Bachelors level, the cluster with the highest enrolment was Business and Administration with 65,832 students, followed by Education (Arts) with 62,095 and Humanities and Arts with 33,030. The clusters with lowest enrolment were in Veterinary with 1,022 students; Manufacturing with 2,157 students and Law with 3,248 students.

At Master's level, the clusters with the highest enrolment were Business and Administration with 18,436 students, Humanities and Arts with 5,745 students and Health and Welfare with 3,637 students. Those with the least were manufacturing with 1 student, Veterinary with 59 students and Architecture with 172 students. At Doctorate level, the clusters with the highest level of enrolment are Business and Administration with 2,301 students, Education Arts with 579 students and Social and Behavioral Science with 461 students. The two with the least are Law and Manufacturing with no students enrolled. For Post-graduate Diploma program the three clusters with the highest level of enrolment are Education (Arts) with 378 students, Humanities and Arts with 129, Teacher Training with 109 students and Engineering with 79 students.

In general, the clusters with the highest number of enrolments were Business and Administration with 86,643 students and that with the lowest enrolment is Veterinary with 1,122 students. Table 2 shows the total enrolment of students grouped in different clusters in Public Chartered Universities. Private Universities had a similar trend, but had much fewer courses compared to public universities. It is evident from these statistics that the university training in the country is giving too much attention to quantity instead of quality.

Table 2

Enrolment per Cluster in Public Chartered Universities

Clusters	Bachelors		Postgraduate Diploma		Master		PhD		Grand Total	Proportion
	M	F	M	F	M	F	M	F		
Agriculture, Forestry & Fisheries	14,623	8,738	0	0	1,130	491	181	52	25,215	5.70%
Architecture	3,347	1,530	0	0	137	35	7	1	5,057	1.10%
Business &Administration	38,787	27,045	48	26	11,057	7,379	1,678	623	86,643	19.60%
Computing	10,267	2,278	8	8	814	225	143	54	13,797	3.10%
Education (Arts)	32,524	29,571	256	122	1,549	1,573	347	232	66,174	15.00%
Education (Science)	16,774	8,417	0	0	137	104	16	8	25,456	5.80%
Engineering	16,530	3,321	64	15	877	197	61	10	21,075	4.80%
Environment	4,490	3,623	2	2	620	305	183	89	9,314	2.10%
Health &Welfare	10,076	9,413	62	13	2,045	1,592	174	149	23,524	5.30%
Humanities & Arts	16,415	16,615	85	44	3,174	2,571	301	136	39,341	8.90%
Journalism & Information	5,262	4,465	0	0	417	399	127	80	10,750	2.40%
Law	1,605	1,643	0	0	194	200	0	0	3,642	0.80%
Life Science & Physical Science	21,359	9,946	34	5	1,277	593	252	79	33,545	7.60%
Manufacturing	1,833	324	0	0	1	0	0	0	2,158	0.50%
Mathematics & Statistics	8,451	3,909	43	10	533	219	145	75	13,385	3.00%
Security & Conflict resolution	3,270	1,235	0	0	366	181	26	5	5,083	1.20%
Services	3,735	4,291	0	0	244	310	29	31	8,640	2.00%
Social & Behavioral Science	16,650	12,546	6	2	2,043	1,399	366	95	33,107	7.50%
Teacher Training	2,423	2,151	57	52	381	151	98	63	5,376	1.20%
Veterinary	745	277	0	0	44	15	29	12	1,122	0.30%
Other	5063	4889	0	0	189	93	3	0	10237	2.30%
Total	**234,229**	**156,227**	**665**	**299**	**27,229**	**18,032**	**4,166**	**1794**	**442,641**	**100%**

CUE Data, 2016

Academic Programmes to Students Ratio

On average, the number of students per programme is 158. The most popular cluster is Law with an average of 551 students per programme, followed by Education (Science) with an average of 543 students per programme. Business and Administration cluster had an average enrolment of 312 students. Some of the clusters with the least number of students include Veterinary, Environment, Agriculture, Forestry and Fisheries with 36, 73 and 74 students per program respectively. This information is presented in Table 3.

Table 3

Programmes to Students Ratio in Public and Private Universities

Cluster	No. of Programmes	No. of Students	Prog: Students
Agriculture, Forestry and Fisheries	363	26,916	1:74
Architecture	26	5,057	1:195
Business and Administration	385	120,223	1:312
Computing	163	22,650	1:139
Education (Arts)	287	79,368	1:277
Education (Science)	56	30,432	1:543
Engineering	145	21,872	1:151
Environment	134	9,843	1:73
Health and Welfare	304	30,578	1:101
Humanities and Arts	475	46,139	1:97
Journalism and Information	85	14,623	1:172
Law	13	7,161	1:551
Life Science and Physical Science	365	34,569	1:95
Manufacturing	11	2,293	1:208
Mathematics and Statistics	140	14,834	1:106
Security and Conflict resolution	50	5,890	1:118
Services	71	9,341	1:132
Social & Behavioral Science	177	38,373	1:217
Teacher Training	94	6,945	1:74
Veterinary	32	1,148	1:36
Other	32	11,494	
Total	**3,408**	**539,749**	

CUE Data, 2016

Academic Staff per Cluster and Rank

An analysis of the spread of academic staff along the five academic ranks gives some interesting insights about staff in universities. Table 4 shows that most professors were found in the science-related fields: Agriculture 211 (1%); Health and welfare 250 (2%); Life and Physical Sciences 248 (2%). On the other hand, staff in the rank of lecturers were concentrated in Business and Humanities. Specifically, 1,358 (8%) lecturers were in Business and Administration; 726 (5%) lecturers were in Humanities and Arts and 581 (4%) lecturers were in Education (Arts). Staff in the rank of Assistant Lecturers again were mainly concentrated in Business and Administration 1,240 (8%) and Education (Arts) 543 (3%). Table 4 shows academic staff per cluster and rank.

Academic Staff per Cluster in Public and Private Universities

There were 16,001 academic staff by rank in public and private universities consisting of 11,828 in public and 4,173 in private universities. Business and Administration cluster had the highest number of academic staff at 3,082 representing 20% of the total academic staff. Health and Welfare cluster had 1,753 teaching staff representing 11% followed by Humanities & Arts cluster with 1,635 representing 10%. The clusters with the smallest number of academic staff were Manufacturing, Security and Conflict Resolution and Education (Science) and Architecture with 50, 128, 152 and 231 respectively. All these clusters registered a proportion less than 1% of the total teaching staff in public universities. Table 5 shows the number of teaching staff in public and private universities. Unless this pattern is regulated, the country will continue witnessing mass production of graduates in Business Administration, Humanities and Arts, with scant staff, which contradicts the current focus on science, technology and innovation for industrialization agenda as espoused in the Kenya Vision 2030 (Republic of Kenya, 2013).

As indicated in Table 5, analysis of these two broad categories of universities of the staffing levels per cluster shows that public universities generally have higher staff levels compared with private universities in all the clusters offered. But there exists a striking similarity in the proportion of academic staff for some clusters. Business and Administration; Health and Welfare and Education (Arts) registered high staff levels in both public and private universities.

It is worth noting that private universities do not offer some clusters especially those that are science-oriented: in fact there were no Lecturers for those clusters.

Table 4
Proportion of Academic Staff per Cluster and Rank in Public & Private Universities

Clusters	Professors	Senior Lecturers	Rank Lecturers	Assistant Lecturers	Graduate Assistants	Total
Agriculture, Forestry and Fisheries	211	133	288	193	78	903
	1.3%	0.8%	1.8%	1.2%	0.5%	5.6%
Architecture	24	36	101	56	14	231
	0.1%	0.2%	0.6%	0.3%	0.1%	1.4%
Business and Administration	114	279	1,358	1,240	91	3,082
	0.7%	1.7%	8.5%	7.7%	0.6%	19.3%
Computing	40	87	355	363	48	893
	0.2%	0.5%	2.2%	2.3%	0.3%	5.6%
Education (Arts)	123	188	581	534	39	1,465
	0.8%	1.2%	3.6%	3.3%	0.2%	9.2%
Education (Science	15	23	53	40	21	152
	0.1%	0.1%	0.3%	0.2%	0.1%	0.9%
Engineering	79	108	220	200	155	762
	0.5%	0.7%	1.4%	1.2%	1.0%	4.8%
Environment	35	58	171	204	44	512
	0.2%	0.4%	1.1%	1.3%	0.3%	3.2%
Health and Welfare	250	318	726	346	113	1753
	1.6%	2.0%	4.5%	2.2%	0.7%	11.0%
Humanities and Arts	176	204	726	471	58	1635
	1%	1%	5%	3%	0%	10%
Journalism and Information	20	29	175	105	31	360
	0.1%	0.2%	1.1%	0.7%	0.2%	2.2%
Law	21	47	197	90	21	376
	0.1%	0.3%	1.2%	0.6%	0.1%	2.3%
Life and Physical Sciences	248	201	498	452	116	1515
	1.5%	1.3%	3.1%	2.8%	0.7%	9.5%
Manufacturing	10	7	13	7	13	50
	0.1%	0.04%	0.1%	0.04%	0.1%	0.3%
Mathematics and Statistics	57	48	136	235	39	515
	0.4%	0.3%	0.8%	1.5%	0.2%	3.2%
Security and Conflict Resolution	7	15	30	63	13	128
	0.04%	0.09%	0.19%	0.4%	0.1%	0.8%
Services	11	16	38	98	33	196
	0.07%	0.10%	0.24%	0.61%	0.21%	1.2%
Social and Behavioral Sciences	125	133	432	241	71	1,002
	0.8%	0.8%	2.7%	1.5%	0.4%	6.3%
Teacher Training	5	14	36	68	4	127
	0.03%	0.1%	0.2%	0.4%	0.02%	0.8%
Veterinary	55	36	52	32	27	202
	0.3%	0.2%	0.3%	0.2%	0.2%	1.3%
Other	42	30	24	42	4	142
	0.3%	0.2%	0.1%	0.3%	0.02%	0.9%
Total	**1,668**	**2,010**	**6,210**	**5,080**	**1,033**	**16,001**
	10%	**13%**	**39%**	**32%**	**6%**	**100%**

CUE Data, 2016

Table 5

Academic Staff per Cluster in Public and Private Universities

Clusters	Public Universities	Private Universities	Total
Agriculture, Forestry and Fisheries	819 5%	84 1%	903 6%
Architecture	231 1%	0 0%	231 1%
Business and Administration	1,883 12%	1,199 7%	3,082 19%
Computing	452 3%	441 3%	893 6%
Education (Arts)	1,048 6.5%	417 2.6%	1,465 9.2%
Education (Science)	144 0.9%	8 0.05%	152 0.95%
Engineering	761 4.8%	1 0.01%	762 4.76%
Environment	433 2.7%	79 0.5%	512 3%
Health and Welfare	1,338 8.4%	415 2.6%	1,753 11.0%
Humanities and Arts	962 6.0%	673 4.2%	1,635 10.2%
Journalism and Information	248 1.5%	112 0.7%	360 2.2%
Law	210 1.3%	166 1.0%	376 2.3%
Life and Physical Sciences	1,484 9.3%	31 0.2%	1,515 9.5%
Manufacturing	50 0.3%	0 0%	50 0.3%
Mathematics and Statistics	431 2.7%	84 0.5%	515 3.2%
Security and Conflict Resolution	128 1%	0 0%	128 1%
Services	172 1%	24 0%	196 1%
Social and Behavioral Sciences	694 4.3%	308 1.9%	1,002 6.3%
Teacher Training	124 0.77%	3 0.02%	127 0.79%
Veterinary	193 1.2%	9 0.1%	202 1.3%
Other	23 0.1%	119 0.7%	142 0.9%
Total	**11,828** **74%**	**4,173** **26%**	**16,001** **100%**

CUE Data, 2016

Academic Staff to Student Ratio per Cluster in Public Universities

Staff to student ratio is one of the most important statistics in any learning institution. This helps in determining the loading levels of the faculty, adequacy of learning space and availability of materials for teaching and learning. Data presented in Table 6 shows the teacher student ratio in public universities. Three clusters stand out as having a relatively high teacher student ratio. These were Education (Science) (1:186); Education (Arts) (1:66) and Business and Administration (1:50).

The clusters with the least ratio included Veterinary, Law, Environment, Health and Welfare and Architecture. The overall staff: student ratio in public universities is 1: 39. This data is presented in Table 6.

Table 6
Academic Staff to Student Ratio per Cluster in Public Universities

Clusters	No. of Staff	No. of Students	Ratio
Agriculture, Forestry and Fisheries	819	26,648	1:33
Architecture	231	5,057	1:22
Business and Administration	1883	93,331	1:50
Computing	452	15,137	1:34
Education (Arts)	1048	69,188	1:66
Education (Science	144	26,772	1:29
Engineering	761	21,710	1:29
Environment	433	9,587	1:22
Health and Welfare	1338	23,599	1:18
Humanities and Arts	962	40,179	1:42
Journalism and Information	248	11,298	1:46
Law	210	3,642	1:17
Life and Physical Sciences	1484	34,385	1:23
Manufacturing	50	2,290	1:46
Mathematics and Statistics	431	14,396	1:33
Security and Conflict Resolution	128	5,126	1:40
Services	172	8,934	1:52
Social and Behavioral Sciences	694	33,491	1:48
Teacher Training	124	5,673	1:46
Veterinary	193	1,122	1:06
Other	23	10,255	
Total	**11,828**	**461,820**	**1:39**

CUE Data, 2016

The staff to student ratios obtained in public universities (1:39) is the same as those in Ghanaian universities (1:39) in 2006/2007 (Tettey, 2010). However, Ghana's private universities have more pressure on the academic staff as the ratio stands at 1:41; compared to the Kenyan case (1:19). On the other hand, South Africa, maintained an average ratio above 1:40 during the period 2001 – 2006 (ibid). But the OECD and EU countries averages were recorded at 1:16 and 1:16 respectively in 2009. (UNESCO Institute of Statistics downloaded from www.oecd.org/edu/eag2011). Kenya might take a long time to reach the EU standards of staff to student ratio since the rate of student enrolment is much higher than the staff development programmes.

Implications of the nature of Programmes offered in Universities in Kenya

The current findings have clearly indicated that public and private universities in Kenya have prioritized programmes in Business Administration, Humanities and Arts. While the market requires graduates in the manufacturing, construction, ICT and other Science related courses, too much concentration in arts at the expense of science – oriented programmes is likely to disadvantage some key national development sectors, which require more practical skills. The findings also indicated that most programmes offered in universities were similar which implies that competition for enrolment into each programme by various institutions would mean lean class sizes and over-production of graduates with similar skills.

These findings are not unique to the Kenyan university sector. The World Bank Annual Report (2014) indicated that the Japanese and British education systems have lately suppressed support and mounting of courses in Arts and Humanities in favour of practical subjects which better target the development needs of these nations. Some programmes were found not to be market-driven but mounted with the expectation of generating revenue for the respective institutions. Notably, some universities developed and mounted programmes with insufficient physical facilities as well as teaching capacity in STEM. There is therefore need to consider the current as well as the future market trends in determining the programmes. Similarly, universities should be encouraged to focus more on their areas of specialization. This will eliminate unnecessary competition and assure quality delivery.

The rapid expansion of the university sector in Kenya has provided an opportunity for majority of students who qualify to access higher education. While having an educated populace is a good indicator for the country's development index, it has also posed a number of challenges such as having many graduates who are not adequately prepared for the market or whose qualifications do not match the market demands (MacGregor, 2008). This calls for continuous review of the programmes offered to ensure alignment to the current and future market demands.

Alignment of Universities Programmes to the Kenya Vision 2030

The Kenya Vision 2030 envisages a "*Globally Competitive Quality Education, Training and Research for Sustainable Development*". In this regard, university education is meant to contribute to national development through high level relevant manpower training; develop the intellectual capability of individuals to understand and appreciate their local and external environments; and acquire both physical and intellectual skills which will enable individuals to be self-reliant and useful members of the society. The Ministry of Education should explore other ways of growing a competitive workforce. A popular strategy used by newly-industrialized economies is that of sending young scholars abroad to bring back new knowledge and skills in fields such as science, medicine, engineering, technology, law, diplomacy and social services (Republic of Kenya , 2013).

In order to achieve the goals above, university programmes should be clearly aligned to the development needs of the country. The realization of the objectives and targets of the Kenya Vision 2030 similarly, hinge on the successful implementation of the enablers or foundations of the three pillars. These include among others: Infrastructure (roads, rail network, seaports airports and pipeline); Information Communication Technology (ICT) and Science, Technology and Innovation (ST&I). The Kenya Vision 2030 further identifies seven priority sectors with high potential of spurring the country's economic growth and development. The sectors are: Tourism, Agriculture and Livestock, Wholesale and Retail trade, Manufacturing, Business process outsourcing/IT Enabled Services (ITES), financial services, oil and mineral resources. For the nation to attain the anticipated 10 percent GDP in the next 14 years, universities have a critical role to play in producing innovative graduates with relevant skills. This could be attained if curricula is aligned to the seven key priority areas.

Conclusion and Recommendations

From the foregoing discussion, it has emerged that the country has given too much premium to quantity rather than quality. The reality is that we are not doing well in the core business that defines a university- research and outreach (Omanga, Saturday, 11th March 2017 p.10). Universities should re-engineer themselves by focusing more on research and innovation in their programmes. Mere teaching and transfer of content without a corresponding hands-on experience or practical work is an effort in futility.

The Commission for University Education (CUE) should steer the sector in a deliberate and strategic manner that distinguishes a university as either research or teaching university. A research university will be expected to have its staff recruited and maintained solely on their commitment to engage in full time research with minimal teaching. These universities will be expected to run doctoral programmes and graduate schools where there is a strong focus on innovation and research. The rest of the universities would be categorized as teaching universities, where graduate programmes are only up to master's level, with emphasis on teaching undergraduate programmes. There is need to recast the focus of higher education, training and research if Kenya is to become a middle-income industrialized country by 2030.

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Uncertainty in Universities in Kenya: The Role of Public Relations Function

Catherine Nandain

Abstract

Universities are riddled with uncertainty at unprecedented levels. Even though organizational change is inevitable, the ongoing statutory and regulatory structural changes are contributing to vagueness, ambiguity and disorientation in the internal operations and planning functions of universities, as well as among its internal publics. This situation is further aggravated by the absence of effective public relations function in the management structures and corporate leadership roles. A recent empirical study revealed unprecedented state of uncertainty of up to 90 percent caused by legal framework such as Universities Act 2012, upgrading of technical and middle level colleges into universities, sporadic student enrolments as well as proliferation of campuses without commensurate facilities. These are all external changes that have caused uncertainty in the internal operations of the universities. Based on the findings of the study, it was apparent that although public relations function plays a critical role in management of organizational uncertainty, this is not effectively mainstreamed in the operations of universities. The study adopted a triangulated design and data collection based on self-administered questionnaires, structured and in-depth interviews as well as focus group discussions. This paper recommends the mainstreaming of PR function in the university's corporate leadership structure and its strategic management.

Introduction

Although public relations function plays a critical role in management of organizational uncertainty, the study revealed absence of it. A triangulated design and data collection based on self-administered questionnaires, structured and in-depth interviews as well as focus group discussions were administered. Mainstreaming of PR function in the university's corporate leadership structure was recommended.

Public Relations (PR) is "one of the key management functions within the organization" (Jugo, Sruk, & Hruška, 2013, p. 820). It is the communication management function that is known for establishing and maintaining mutual and beneficial relationships between organizations and their

publics, on whom their success or failure depends (Belasen, 2008; Broom, 2009; Cutlip, Center & Broom, 2000; Grunig, 1992 a, 1992 b). Every organization is therefore expected to establish and maintain processes, activities and functions that provide an enabling environment, for PR to thrive. PR function can therefore be viewed as a subset tool of PR, whose main responsibility is that of identifying, analyzing, and disseminating information between an organization and its publics, with the aim of persuading them to maintain a certain point of view or positive orientation about the organization's activities (Broom, 2009; Van Riel, 1995).

Uncertainty has become a common phenomenon in modern organizations. This is particularly due to the ever-changing internal and external environments that organizations have to operate in. From the foregoing description, uncertainty is therefore a state of mind, whose key characteristics are; unpredictability, unreliability, inconsistency, unsureness, indecision, hesitancy, skepticism and lack of certainty, all of which are caused by an environment of anonymity about the future (Clampitt & Williams, 2000; Milken, 1987). Uncertainty, therefore, depicts a state of disorientation or disharmony in people's minds. As emphasized by Milken (1987), it is people in the organization who feel uncertain and not organizations. To this end, the use of the phrase 'organizational uncertainty' implies the people in the organizations not the organizations themselves.

Statement of the Problem

The growing demand for university education in Kenya prompted the Government to respond by upgrading middle level colleges to university status and introduction of new rules, standards and regulations for quality assurance. However, eventual compliance to these regulations have significantly altered the usual structural, operational and interpersonal relationships leading to uncertainty. If uncertainty is not minimised, efforts to fulfil the university's vision, mission and objectives shall remain hindered (Clampitt & Williams, 2000, p. 13).

Previous studies have shown that, organizational uncertainty can be lessened through effective use of public relations function. This study therefore was to assess the role of PR function in managing organizational uncertainty among the internal publics of public Universities in Kenya.

Purpose of the Study

The purpose of this study therefore was to assess the role of PR function in bridging communication gaps with a view of minimizing, lessening or eliminating uncertainty during the transitional period.

Research Questions

The following questions guided the study to its conclusion; what types of uncertainty existed? What communication factors caused uncertainty? What was the role of PR function in managing uncertainty?

Theoretical Framework

Two theories were adopted; first, is Taylor's co-orientation theory of organization which explains organizational changes, the theory posits that if change is not well communicated it leads to disorientation, hence uncertainty (Newcomb & Theodore, 1953). The second is C.R Berger and Calabrese's uncertainty reduction theory (URT) which explains how an organization's management can make deliberate attempts to manage uncertainty caused by organizational change among its internal publics (Berger and Calabrese, 1975). In both these theories, PR function as a relational management tool is usually used to enhance communication and to minimize uncertainty.

Methodology

A descriptive survey design was adopted (Austin & Pinkleton, 2006; Chandra, 2004; Stacks, 2006), with a mix of quantitative and qualitative approaches. Because descriptive surveys seeks for detailed data and insights about respondents, especially attitudes, beliefs, actions, and opinions, it was found appropriate for the study (Stacks, 2006).

The study aimed at collecting detailed factual information that described existing phenomena (Vyhmeiser, 2001). The information contains responses from respondents on their attitudes, feelings, behavior and opinions in relation to organizational change and uncertainty management at Technical University of Kenya(TUK), (Kothari, 2004; Orodho, 2003).

On the one hand, qualitative approach determined the instruments for collecting data from respondents by engaging participants in flexible interactions, which yielded information that is rich and extensive to measure subjective levels of accuracy, precision and validity (Austin & Pinkleton, 2006; Chandran, 2004; Creswell, 2009; Kothari, 2004). Interview schedules and Focus Group Discussions were used in the collection of qualitative data, a structured questionnaire was used to collect numerical data, in relation to demographics like age, number of years worked, level of education, job designation, communication approaches used and the level of effectiveness.

Data Analysis

The filled questionnaires were collected, and subjected to Statistical Package for Social Sciences (SPSS) for processing and presentation, while responses from interviews and focus group discussions were, first transcribed, then presented. Data from focus group discussions and subjected to Qualitative Data Analysis (QDA) software as well as descriptive data presentation, while data from interviews was presented using tables and descriptive approach. The following section deals with data presentation, analysis and interpretation from each of the three tools of data collection.

Discussion

The discussion of the findings were based on the objectives of the study, which were; to establish the types of uncertainty, to determine the communication factors causing uncertainty and to examine the role of PR function in managing uncertainty at TUK.

PR Role in Uncertainty Management

PR function in managing uncertainty at TUK with the question; what is the role of PR function in managing uncertainty at the Technical University of Kenya? This objective was addressed by question 15 of the questionnaire, question 12 of the interview guide and question 4 of the focus group discussion guide. Majority of the questionnaire respondents (50.0%) disagreed with the assertion that, public relations played a key role in identifying and communicating information between the University's management and the rest of the staff to reduce uncertainty. The findings point to the fact that PR function did not play any significant role in ensuring that

uncertainty among internal publics was managed. Responses from interview respondents indicated that PR function was actually none functional in accordance with the construct of this study, while responses from focus group discussions indicated that PR was for the external publics and not internal. These opinions can further be justified by the organizational chart of TUK, which clearly shows that the corporate communications and marketing director is not among the senior management functions of the University.

Conclusion

Deriving from this study, and in addressing specific objectives of the study as well as addressing the statement of the problem of the study, the following conclusions were highlighted:

Environmental (external), organizational (group) as well as individual (job-related) uncertainty all existed among different cadre of internal publics of TUK as a result of the ongoing change process.

Communication factors such as; predominant use of one- way approach of communication, provision of untimely, unclear, imprecise and incomplete information; ineffective methods of gathering and utilizing feedback were responsible for the existence of organizational uncertainty at TUK.

Despite the existence of clear trends that public relations hold an increasingly important role in organizational management at the global level, there was significant evidence that the role of PR function was misunderstood, and so it was not playing its role effectively towards managing uncertainty at TUK, especially on the strategic level.

Recommendations

The study recommends that the management should incorporate the PR function in the executive management, so that the officer is part of the planning and execution of change processes, with the view of harmonizing and building consensus between the internal publics, especially in making decisions and responses to changes at the university.

Areas for Further Research

The study also makes the following recommendations for further research;

- Methodological study on the identification and management of uncertainty at the university during the transition period in public universities in Kenya should be carried out.
- Communication audit studies should be conducted at various universities including Technical University of Kenya with a view of developing communication approaches and networks and PR models that lessen uncertainties.
- Studies on alternative communication approaches in university education sector should be done with a view of contributing to existing literature.
- A research to establish public relations function framework in public Universities in Kenya should also be conducted.

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