

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/334646431>

Research infrastructure in Kenyan universities: Library and Information Communication Technology

Chapter · July 2019

CITATION

1

READS

626

3 authors, including:



Florence N. Weng'ua

The Technical University of Kenya

2 PUBLICATIONS 3 CITATIONS

SEE PROFILE



Daniel Chebutuk Rotich

Moi University

24 PUBLICATIONS 87 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Research Productivity and Visibility of Academic Staff in the College of Health Sciences, Moi University, Kenya between 2002 and 2014 [View project](#)



Quality and Relevance of Illustrations in Approved Primary School Textbooks [View project](#)

Research infrastructure in Kenyan universities: library and information communication technology

*Florence N. Weng³ua¹, Daniel Chebutuk Rotich², Emily J. Kogos²

¹The Technical University of Kenya

²Moi University

Email: *wenguaflorence@gmail.com

Abstract

Research infrastructure plays a vital role in knowledge and technological advancement. Research infrastructure is important in academic research because excellence in research requires sound infrastructure for data collection, management, processing, analysis and archiving. This chapter examines the state of research infrastructure in Kenyan universities and recommends strategies for improvement. Questionnaires and interviews were used to collect data from university academic staff, librarians and Information Communication Technology (ICT) staff drawn from two universities in Kenya. A sample of 110 was selected from a population of 427. The results indicate that library and Information Communication Technology (ICT) are the major research infrastructure in Kenyan universities. University libraries have created institutional repositories to preserve, archive and provide access to the works of faculty and researchers. However, there is inadequate documentation on research output and scholarly publication. Library and ICT units in Kenyan universities experienced challenges including: inadequate funds, inadequate current and relevant reading resources, unreliable Internet access and inadequate staff. University libraries rely mostly on e-resources obtained through the Kenya Library and Information Services Consortium (KLISC). The study recommended enhanced research funding and improved access to research infrastructure.

Keywords: *Research infrastructure, Kenya, Universities, Library, Information Communication Technology*

1 Introduction

Research infrastructure is a fundamental requirement for research work supporting organised research and researcher education while maintaining and developing the university's research capacity. Components of research infrastructure include: laboratories, libraries, databases, communication networks etc. According to Organization for Economic Co-operation and Development (2004), universities play a vital role in the research and innovation system. Migosi, Muola and Maithya (2012) observed that research is a pillar of any university system and as such universities in Kenya are required to conduct research and disseminate findings. To achieve excellence in research requires access to excellent research infrastructure. In Kenya, the Commission for University Education (CUE) has set up standards and guidelines for universities. For example, every university should provide appropriate and adequate facilities to cater for the number of programmes on offer and students' enrolment. The facilities include libraries and Information Communication Technology (ICT) infrastructure (CUE, 2018). According to Obioha (2005), ICT plays an immense role in information sourcing, generation, processing, storage, retrieval and dissemination. Similarly, the library is vital in providing equal access to information and education. The library

contributes to the achievement of university aspirations by providing high quality research and learning environment and access to scholarly collections and resources across multiple sites (Monash University, 2018)

Migosi *et al.* (2012) and Ngome (2003) observed that one of the key factors that have stunted the growth of research in the Kenyan university system is inadequate research funds. A large portion of support (although inadequate) for postgraduate and staff training and research is contributed by donors and international organisations. It was also pointed out by Rotich (2010) that it is not easy for Kenyan universities to support research because most of them are severely constrained by inadequate funds. Therefore, most research activities depend on donor support. However, Kenyan universities are making progress by increasing allocation of funds to research using internally generated funds and mobilising research grants from donors. The University of Nairobi, for instance, has in particular intensified collaboration with local and international partners, which has resulted in a substantial increase in the available research grants.

2 Problem and purpose of the study

The demand for university education in Kenya has increased drastically and has outpaced supply. Report of the Public Universities Inspection Board (Republic of Kenya, 2006) noted that accelerated growth in student numbers in universities has not been matched by expansion of physical facilities and academic infrastructure and some of the existing infrastructure was in inadequate and dilapidated. Universities in Kenya are required by law to provide appropriate and adequate facilities to cater for the number of programmes on offer and students' enrolment. These include library and Information Communication Technology (ICT) infrastructure. Those universities that do not comply are severely restricted. High standard research infrastructures are crucial to the success of any university. This chapter explores the current state and developments in research infrastructure, in terms of library and ICT facilities, and recommends strategies for improvement. The chapter specifically provides insights into the current state of research infrastructure in Kenyan universities; the adequacy of funds allocated for research; as well as the challenges libraries and ICT units in Kenyan universities face which affect their capacity to support research adequately in the institutions.

3 Research Methodology

The study which generated data for this chapter used an exploratory research design. An exploratory research is a valuable means of understanding what is happening, seeking new insights, asking questions and assessing the phenomena in new light (Yin 1994). An exploratory research design was appropriate because there was need to explore the full nature of the phenomenon. An assessment was conducted on

the research infrastructure and adequacy of funds allocated to research by universities. The study adopted mixed methods research approach. Both qualitative and quantitative data was collected. The need to investigate research infrastructure in selected Kenyan universities required a qualitative approach while there were aspects of quantification of data, for example, rating research infrastructure in percentages and response rates that required a quantitative approach. According to Straus and Corbin (1990), quantitative and qualitative methods can be combined in the same research project providing greater insights in the findings. Technical University of Kenya and Strathmore University, located both in Nairobi, constituted the target population. The study sites were selected purposefully to bring out the differences and similarities between the public and private chartered universities in terms of resource availability. The population for the study consisted of academic and administrative staff, library and Information Communication Technology (ICT) personnel from Technical University of Kenya (TUK) and Strathmore University (SU). The sample size for this study was 110 comprising of eighty (80) lecturers both from Technical University of Kenya (TUK) and Strathmore University (SU), fifteen chairpersons of departments and fifteen (15) key informants from universities. The key informants were seven (7) directors/deans of schools, two (2) research directors, two (2) librarians, two (2) Information Communication Technology (ICT) directors and two (2) deputy vice chancellors in charge of academic and research from both universities.

Purposeful sampling was used to select the key informants while stratified and simple random sampling techniques were used to select the university lecturers. The researcher divided the lecturers into groups basing on schools then used simple random sampling to draw the sample. Simple random sampling is the sampling method in which each member of the population has an equal chance of being selected. The researcher distributed ninety five (95) self-administered questionnaires: eighty (80) questionnaires were distributed to lecturers and fifteen (15) to the chairpersons of departments of the two universities. Seventy (87.5%) questionnaires from lecturers and 10 (66.7%) questionnaires from chairpersons of departments were collected back. Interviews were conducted with key informants from both universities.

4 Findings and Discussions

The findings of the study are presented and discussed hereunder according to the objectives of the study on which this chapter is based.

4.1 State of research infrastructure in Kenyan universities

One of the objectives of the study was to assess the state of research infrastructure in Kenyan universities. The lecturers were asked about the research infrastructure in their universities and to rate their state. The infrastructure reported were: library, laboratories, ICTs and research sites. Other research infrastructure

cited were: directorate of research, online libraries and plagiarism checkers. Table 1 presents the perceptions of the respondents on the state of research infrastructure in the two selected universities.

Table 1: Perceptions on the respondents on the state of research infrastructure at Technical University of Kenya and Strathmore University (multiple responses)

Infrastructure	State of infrastructure									
	Very good		good		Fairly good		Poor		Very poor	
	%	n	%	n	%	n	%	n	%	n
Library	25	17	37	26	27	19	8	6	2.8	2
ICT	25	17	34	24	23	16	7	5	11	8
Laboratories	18	13	18	13	-	-	2	2	-	-
Research sites	10	7	25	17	25	17	2	2	-	-

Source: Research data

The state of the library and ICT varied from institution to institution. Findings indicate that 42 (60%) of the lecturers did not rate the laboratories stating that it was not applicable to their areas of specialisation. Another 27(38.5%) were unable to rate the research sites. This was because the research directorate in their university was new and they had not done much in terms of creating research sites. Findings revealed that the state of research infrastructure in private chartered universities is better than the public universities where most lecturers indicated that the state of research infrastructure is poor.

The chairpersons of departments reported that library and ICT were the major research infrastructure in the universities. However, the response about research sites and laboratories was very low indicating that laboratories were not applicable to their areas of specialisation. The study sought the views of the librarians, ICT directors, research directors and deputy vice-chancellor in-charge of academics and research on the state of research infrastructure in their institutions. On the side of the library, one respondent said that the library was not well stocked and that the available space was inadequate considering the large number of users. This finding concurs with Eshiwani (2009) who noted that Kenyan universities lack text-books and journals. The respondent added that they have challenges acquiring print resources and relied mostly on e-resources acquired through the Kenya Library and Information Services Consortium (KLISC) whose mandate is to bring together university libraries for the benefit of students, lecturers and researchers. Conversely, another respondent reported that they have a well-stocked library and it is one of the best libraries in the country. These findings show that the state of research infrastructure and resources varies from university to university. It was observed that there is a big difference between public and private chartered universities. The results are in agreement with those of Gudo, Olel and Oanda (2011) who found that 100% and 47% of librarians in private and public universities, respectively, were satisfied with available print journals.

The results showed that the libraries have digital repositories where all the research output from their universities is stored. This finding is similar to that of UNESCO (2018) which observed that many libraries in Africa have established institutional repositories. However, documentation of research output and scholarly publications was inadequate and takes long periods of time before getting into the library.

The study also found out that universities offer free and unlimited access to the Internet to researchers and students. However, it was observed that the Internet speed was low while the coverage was weak. Nonetheless, one university has a fully incorporated ICT in all areas with high speed and bandwidth provided by Kenya Education Network (KENET). KENET is a national research and education network that promotes the use of ICT in teaching, learning and research in higher education institutions in Kenya.

4.2 Adequacy of funds allocated for research by universities

The study assessed the adequacy of funds allocated to research by universities. The respondents were 70 lecturers, 10 chairpersons of departments and deans or directors of schools. Out of the 70 lecturers, 53 (76 %) said their universities allocate funds to research; 12 (17%) said no funds were allocated to research and 5 (7%) said they were not aware of funds allocated for research. It was noted that the five lecturers, who said they were not aware of research allocations, were new. Probed further as to how adequate the funds allocated to research were, 9 (12.8%) said the funds are adequate; 35 (50%) said the funds were inadequate; 7 (10%) said the funds were more than adequate; and 2 (2.9%) did not know whether the funds were adequate, inadequate or more than adequate. About the proportion of funds allocated to research as compared to the total budget of the university, most of the respondents were not aware of the percentage. The respondents who said it was most adequate said that the proportion of funds allocated to research as compared to the total budget of the university was 20% and above; those who said it was adequate said it was 10-20%; while those who said it was inadequate were of the view that it was less than 10%. On their part, 9 (90%) chairpersons of departments said there were no funds allocated to research by their university while 1 (10%) said, there were funds allocated for research by the university. The one who said there are funds added that the funds are inadequate and the proportion of funds allocated to research as compared to the total budget of the university was less than 10%.

In response to the adequacy of funds allocated to do research, all the key informants said their institutions allocate funds to research but said the funds were not adequate. They said researchers requested for more funds. The findings showed that the proportion of the funds allocated to research compared to the total budget of the university was less than 10%. The key informants suggested that more funds should be allocated to research; researchers should look for alternative ways to fund research, for instance, by

applying for research grants; universities should partner and collaborate with other universities; and universities should engage the private sector through business projects to generate funds for research.

The findings have revealed that funds allocated for research by universities in Kenya are inadequate. Similarly, it is evident that university library budgets keep fluctuating from year to year. According to the Commission for University Education (2018), all universities in Kenya, both private and public, ought to spend at least 10% of their total institutional budgets on information resources to support the on-going and appropriate needs of the library. However, this regulation is yet to be adhered to by most institutions of higher learning in Kenya.

4.3 Challenges of ICTs in libraries

The findings revealed that ICT units and libraries in academic institutions in Kenya face a number of challenges including: high costs of acquiring and upgrading the current systems; inadequate staff; unreliable Internet access; lack of current and relevant reading resources; lack of appropriate furniture; space constraints; vandalism and inadequate funding. According to Otike and Omboi (2010), the library is of no use if it does not have suitable information materials. For the university library to support the mission of the institution, it is required to regularly acquire sufficient current and relevant information materials. These findings are in line with those of UNESCO (2018) that inadequate funding, inadequate staffing, and lack of facilities or infrastructure are the greatest barriers to adoption of Open Access (OA). Ayiro (2015) also pointed out that university libraries are overcrowded while book collections are outdated and inadequate. Okwakol (2008) also noted that library facilities and information systems in almost all the universities are antiquated with books and scholarly journals which are not only few but very old and therefore irrelevant to the current needs and priorities.

The results are also in agreement with those of Gudo *et al.* (2011) who observed that lack of relevant books, inadequate use of the Internet and general lack of reading space created the major constraints to student reading. Ndethiu (2007) also pointed out that lack of adequate reading resources posed a challenge to students reading habits.

Appearance of ICT on the global scene has caused a revolution in libraries and the only way to satisfy users demand is to use ICT in information service delivery. Kenyan universities are not exceptional and therefore should keep pace with new inventions in ICT. In this technological era, library users mostly prefer e-resources to print resources. This poses a challenge to libraries with inadequate ICT systems.

5 Conclusion

The study established that the state of research infrastructure in universities varies from institution to institution. The majority of the respondents revealed that their institutions have libraries and ICT. However, the respondents were of the view that the research infrastructure is inadequate as compared to the number of users. They recommended more investment in the same so as to cater for the needs. The findings obtained indicate that funds allocated to research by universities are inadequate and library budget keeps on fluctuating from year to year. High cost of acquiring and upgrading the current systems, inadequate staff, lack of current and relevant reading resources, space, vandalism and inadequate funding are some the challenges university libraries in Kenya face.

6 Recommendations

Improved access to research infrastructure may be achieved by investing more on the provision of reliable Internet connectivity and library. Since most libraries in Kenyan universities have access to current electronic academic resources through KLISC, librarians should improve their skills and embrace emerging technologies to promote the use of ICT in information dissemination and management. The Internet speed should be improved to enable sharing of researches and scholarly materials globally. Research centres should be created by universities. Staff expertise should also be improved, for example, by employing more professors to nurture the young researchers and scholars and also through training. Universities should provide good environment for research. Laboratories should be in good conditions and researchers and scholars should be provided with computers to enable them to undertake research.

Universities should allocate more funds to research by also obtaining funds from other sources without relying on the two per cent from the government. Universities should collaborate with funding agencies, train the staff on how to source for funds, and engage in business to acquire more funds for research. If funds are increased, the universities will be able to pay for journal subscriptions, buy current and relevant books, improve Internet connectivity, acquire new ICT systems and establish Open Access (OA) repositories for information storage and dissemination.

7 References

- Ayiro. L. (2015, Oct 3), The trouble with our varsities and how to sort them. Daily Nation [online]
Retrieved May 25, 2018 from <http://www.nation.co.ke>
- Commission for University Education. (2018) Status of universities: universities authorized to Operate in Kenya.[Online].http://www.cue.or.ke/images/docs/Accredited_Universities_in_Kenya_November_2017.pdf (7 January 2018).
- Eshiwani, G (2009). University Expansion in Eastern Africa: Challenges and Options in Higher

- Education. Inter-University Council for East Africa (IUCEA). Newsletter Vol. 39 pp 17-22.
- Gudo, C.O, Olel, M.A and Oanda I.O, (2011). University expansion in Kenya and issues of quality education: Challenges and opportunities. *International Journal of Business and Social Science* Vol 2. No 20. Retrieved 26 May 2018 from www.ijbssnet.com
- Migosi, J. A., Muola, J.M. and Maithya, R. (2012). Perceptions of academic staff on research and publishing in Kenyan universities. *International Journal of Education Administration and Policy Studies*,4(4):115-126.[Online].http://41.89.55.71:8080/xmlui/bitstream/handle/123456789/65/Migosi_%20Perceptions%20of%20academic%20staff..pdf?sequence=1&isAllowed=y (25 March 2017)
- Monash University (2015). Research resources and infrastructure. [Online] Retrieved September 9, 2015 from <http://www.monash.edu>
- Ndethiu, S.N (2007). *The Role of Kenyatta University in Promoting Good Reading Habits among Undergraduate Students*. Unpublished PhD Thesis. Kenyatta University.
- Ngome, C. (2003). Country Higher Education Profiles: Kenya. In *African higher education: an international reference handbook*. D. Teferra and P. G. Altbach Eds. Bloomington: Indiana University Press.
- Obioha J (2005), The role of ICT in information seeking and use amongst research officers in research institutes in Nigeria. The Nigerian institute for oceanography and marine research institute experience. *The International Information and Library Review*. Vol 37 No 4. Retrieved from <http://www.sciencedirect.com>
- OECD (2004), *Financial Management and Governance in HEIS: Australia national report* . Retrieved May 15, 2018 from www.oecd.org
- Okemwa, E. (2007). Scholarly publishing in sub-Saharan Africa in the twenty-first century: challenges and opportunities. *First Monday*,12(10).[Online].DOI:10.5210/fm.v12i10.1966.
- Okwakol, M.J.N (2008). *Challenges and Prospects for Quality Assurance in Science and Technology Education in African Countries*. The Uganda Higher Education Review. Journal of the National Council for Higher Education, Vol 5 No.2 Pp 17-26.
- Otike F and Omboi B M, (2010), Challenges faced in establishing university libraries in Kenya [Online] Retrieved May 23, 2018 from <http://www.researchgate.net/publication/287998288>
- Republic of Kenya (2006). *Transformation of Higher Education and Training in Kenya to Secure Kenya's Development in Knowledge Economy: Report of The Universities Inspection Board (Kinyanjui Report)*, Nairobi: Government Printers.
- Rotich, D.C. (2010). The present and future growth of scholarly publishing in Africa. In *Demystifying and popularizing LIS research in modern times: proceedings of 11th DLIS*

Annual Conference. D.N. Ocholla and N. Evans, Eds. Richards Bay: University of Zululand.
44-51.

Straus, A and Corbin J, (1990) Basics of qualitative research: grounded theory procedures
and techniques. Newbury Park: CA; Sage publications

UNESCO (2018), Communication and information. Global Open Access Portal, Africa Kenya.

Retrieved May 20, 2018 from <http://www.unesco.org>

Yin, R.K,(1994) Case study research: Design and Methods (2nd ed). Newbury Park, CA:
Sage publications