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# **Factors affecting Knowledge Production, Diffusion and Utilisation at the University of Zambia School of Medicine**

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## **ABSTRACT**

The aim of this paper was to explore the factors affecting knowledge production, diffusion and utilisation in a university environment taking the University of Zambia Medical School as a case of study. Methodologically, a survey of lecturers was carried out. Data was collected using a semi structured questionnaire; and analysed using MS Excel which was later presented in simple statistics of figures and graphs. The study established that knowledge production, diffusion and utilisation was affected by inadequate funding, time, interest, technology, availability of appropriate reading materials, incentives, internet research skills, heavy workload and lack of publication outlets. The study contributes to the understanding of the context of the factors that may play a negatively role in the knowledge production, diffusion and utilisation practices in Universities.

**Key Words:** Biomedical Research, Knowledge Diffusion; Knowledge Production; Knowledge Utilisation; Research Dissemination; Research Productivity; Research Utilisation; University of Zambia; Zambia.

## **1.0. INTRODUCTION**

The University of Zambia Medical School is the oldest Medical School in Zambia<sup>1</sup>. The School of Medicine was one of the first schools of the University of Zambia when it was promulgated in 1965 by an act of parliament, Act No. 66 of 1965. However, it was only able to get its first intake of students in 1966, with its clinical departments attached to the University Teaching Hospital (University of Zambia, 2015, p. 294). The University of Zambia School of Medicine operates under a broad mandate of the University of Zambia under Section 12 (1) of the Higher Education Act No. 4 of 2013, which stipulates that it should: a) provide higher education, promote research and advancement of learning; and b) disseminate knowledge and hold out to all persons, without discrimination, the opportunity of acquiring higher education (Government of the Republic of Zambia, 2013, p. 106) as amended in 2021 (Government of the Republic of Zambia, 2021) . All these roles entail the production, diffusion and utilisation of knowledge. Knowledge produced can either be in the form of graduates or indeed as research output presented in publications whether print or online. Knowledge production, diffusion and utilisation are important aspects of a University enterprise. Knowledge has to be produced, diffused (in form of journals, books or nowadays in their e-forms) and then ultimately that knowledge is up taken by society in general. This study

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<sup>1</sup> Note: As of 2017, the School of Medicine had been divided into four schools namely, the School of Medicine, School of Health Sciences, School of Nursing Sciences and School of Public Health

relates to aspects of knowledge production, diffusion and utilisation patterns. It only relates to knowledge as in its expressed form and not graduates.

## **1.0. OBJECTIVES OF THE STUDY**

The aim of this paper was to explore the factors affecting knowledge production, diffusion and utilisation in a university environment; specifically asking the question: what are the determinants to knowledge production, diffusion and utilisation in the School of Medicine, University of Zambia.

## **2.0. LITERATURE REVIEW**

Some of the factors affecting knowledge production, diffusion and utilisation in the knowledge production process cycle faced by most developing countries are well documented. A study in Ecuador, Peru and Colombia found that previous research output as well time, resources, leadership in research, time, academic rank, the time invested in research as some of the factors that have an impact on research productivity (Armijos Valdivieso, Avolio Alecchi and Arévalo-Avecillas, 2021). Musiige and Maassen (2015, p. 113) identified these factors that have a bearing on research productivity as falling under: individual factors, organisational factors, funding and research culture as the main barriers to research production. A review of publications from 1998 to 2018 on African research reveals that institutional factors impact research productivity more than individual factors at the researcher level (Uwizeye *et al.*, 2022). In this context, Muia and Oringo (2016: 1786) summarises these determinants of research productivity as broadly falling in four categories namely: research culture, institutional factors, research environment and resource factors. In a review of these factors, there were intrinsic individual, institutional and country factors that influence research productivity leading to the skewed north-south knowledge production dynamic, with developing countries being disadvantaged (Heng, 2020; Heng, Hamid and Khan, 2020).

Alrahlah (2016, p. 448), in a study in Saudi Arabia, claimed that “lack of proper funding and support along with a lack of research facilities” are some of the major barriers to research productivity. Rahman and Fukui (2003, pp. 277–278) have also argued that “most of the developing countries tend to have difficulty in contributing to new developments and in applying new knowledge for their benefit due to a myriad of factors, including scarce government funding, an insufficient number of scientists and physicians, miniscule private investment, the negative attitude of public policymakers towards research and development, and the brain-drain to developed countries”. Others such as Iqbal and Mahmood (2011, p. 191) found heavy teaching load and administrative duties to have influenced research productivity. These factors impinge on the researcher’s time that they can spend on research and therefore write and publish knowledge outputs. In a study across various African countries of Nigeria, Senegal, Ghana, Malawi, Zambia, Tanzania, Benin, Zimbabwe, Kenya, and the Democratic Republic of the Congo, the challenges of young African researchers were “scarcity of mentors, lack of funding, lack of writing skills, lack of motivation, and low demand for research by policymakers” (Kumwenda *et al.*, 2017: 4). In South Africa, “heavy workload, career ambiguity, poaching, staffing, sabbatical leave policy, large student numbers, unawareness of incentives, poor retention strategies, institutional history, understanding of research mandate, clarity of policies and procedures and poor time management” (Abe and Mugobo, 2021, p. 113) were all factors that were attributable to have caused the existing low research productivity at the universities of technologies (UoTs). In Nigeria a lack of resources such as finances were found to be among the main barriers to

research productivity (Ogunsola *et al.*, 2020). However, what is critical is for the research environment to be alive to current challenges and developments; and to be able to respond to the challenges timely so that there is increased research output. Woodiwiss (2012), Cloete et al. (2011), Abrahams, Burke and Mouton (2009) and Owolabi, Bower and Ogunniyi (2007) have all pointed out that some of the barriers may have a bearing on the research productivity of individual researchers and ultimately have an impact on the research output of the both the researcher and the institution. Less funding to health research in developing countries has been a matter that has dominated the world health research community for a long time; with a call for increased funding made at various fora. There is a general recognition that in order to improve research performance and research output, it was important to improve the general research environment and infrastructure. Ultimately, it is important for each institution to be aware of these factors that affect knowledge production, diffusion and utilisation so that they can provide evidence based responses.

### 3.0. METHODOLOGY

Semi-structured questionnaires were administered to the respondents during the period May 2016 to January 2017. Quantitative data obtained from the questionnaires were computed and analysed using descriptive statistical methods. Open-ended questions from the questionnaires were isolated, themes extracted and analysed thematically

### 4.0. RESULTS OF THE STUDY

#### 5.1. Demographic Profile of Respondents

The results from the study indicate that the respondents with PhD qualifications were 19 (46.3%) and those with Master's degree were 22 (53.7%). Eleven (26.8%) of the respondents were employed at the Lecturer III grade, 10 (24.4%) at the Lecturer II grade, 9 (22.0%) were at the Lecturer I grade, 3 (7.3%) were Senior Lecturers, 4 (9.8%) were Associate Professors and 4 (9.8%) were Professors. In terms of work experience, the largest number of the respondents had worked for the institution for a period of 5-12 years (17, 41%). See Table 1.

**Table 1. Demographic profile of respondents**

	<i>Qualification</i>	<i>Frequency</i>	<i>Percent</i>	<i>Cumulative Percent</i>
Highest Level of Qualification	Masters	22	53.7	53.7
	PHD	19	46.3	100
	<b>Total</b>	<b>41</b>	<b>100.0</b>	
Academic Rank	Lecturer III	11	26.8	26.8
	Lecturer II	10	24.4	51.2
	Lecturer I	9	22.0	73.2
	Senior Lecturer	3	7.3	80.5
	Associate Professor	4	9.8	90.2
	Professor	4	9.8	100.0
	<b>Total</b>	<b>41</b>	<b>100.0</b>	
Work Experience	Less than 4 years	8	20	20
	5-12 years	17	41	61
	13-20 years	8	20	81
	More than 20 years	8	19	100.0
	<b>Total</b>	<b>41</b>	<b>100.0</b>	

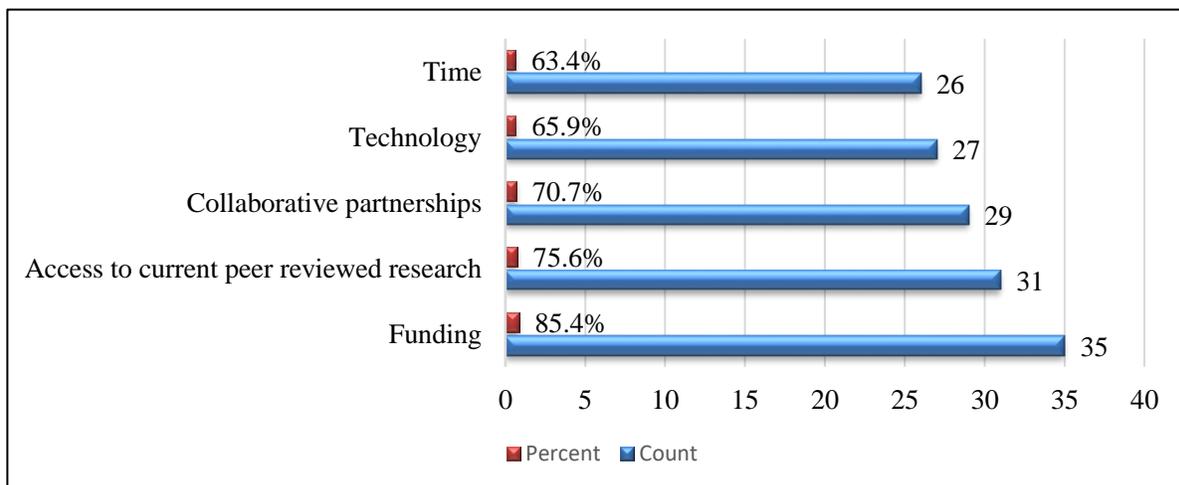
## 5.2. Factors affecting Knowledge Production, Diffusion and Utilisation

The respondents were requested to identify the most significant barriers that impeded knowledge production, diffusion and utilisation at University of Zambia Medical School. The findings clearly indicate that the largest majority of them were most concerned with lack of funding (36, 87.8%) and insufficient time to engage in knowledge production, diffusion and utilisation (26, 63.4%). The other barriers, although to a lesser extent, were that the institution did not provide sufficient incentives for knowledge production, diffusion and utilisation (19, 46.3%); lack of Internet access (16, 39.0%); lack of appropriate reading materials (11, 39.0%); lack of publication outlets (9, 22.0%); and lack of Internet research skills (7, 17.1%). Only 2 (4.9%) respondents indicated that they had no interest in knowledge production, diffusion and utilisation. See Table 2 and Figure 1.

**Table 2. Factors affecting Knowledge Production, Diffusion and Utilisation**

	<i>Frequency</i>	<i>Percent</i>
Lack of funding	36	87.8
Insufficient time	26	63.4
No incentives for knowledge production, diffusion and utilisation	19	46.3
Lack of Internet access	16	39.0
Lack of appropriate reading materials	11	26.8
Lack of publication outlet	9	22.0
Lack of Internet research skills	7	17.1
No interest in knowledge production, diffusion and utilisation	2	4.9

Knowledge production diffusion and utilisation determinants are those factors, processes or activities that can either hinder or foster knowledge production diffusion and utilisation. It was therefore important to ask the respondents what other issues they thought were cardinal to knowledge production, diffusion and utilisation. The responses to this question are depicted in Figure 5.15 below. It can be seen that 85.4% (35) of the respondents felt that funding was an issue, 75.6% (31) thought that access to current peer reviewed research was vital, 70.7% (29) highlighted collaborative partnerships as being important, whilst 65.9% (27) and 63.4% (26) respectively viewed technology and time to be significant determinants.



**Figure 1: Determinants of Knowledge Production, Diffusion and Utilisation**

## **5.0. DISCUSSION OF FINDINGS**

There were various determinants that came out prominently amongst the respondents as being some of the impediments to increased research output, diffusion and utilisation at the UNZA School of Medicine. The established barriers to knowledge productivity in the university environment are hereby listed, analysed and discussed.

### **6.1. Lack of funding**

The findings indicate that 36 (87.8) of the respondents lacked funding to carry out research. Access to adequate financial resources is major contributor to research productivity (Sulo *et al.*, 2012, p. 478; Muia and Oringo, 2016, p. 1790) . Kulyambanino (2016, p. 52) states that funding is one of the research supporting systems that are needed to increase research output. What is generally agreed is that most institutions in Africa require funds in order to set up the necessary infrastructure to support research. In Portuguese speaking African countries of Angola, Cape Verde, Guinea Bissau, Mozambique and São Tomé and Príncipe, the state of inadequate funding for higher education (Langa, 2014, p. 96) is comparable to that being faced by other countries on the continent. Conversely, in her study, Kulyambanino (2016, p. 62) surmises that the Directorate of Research and Graduate Studies at the University of Zambia, a body that is responsible for overall research at the institution felt that even though funding for research was a major hindrance, there was another impediment: “the poor quality of the manuscripts produced by some academic members as well as produced by the students. The manuscripts had not been packaged the way they should if they were to compete favourably, on the international market for publication”. This means that even if funding were to be available for publishing, the manuscripts were of such poor quality to meet the standards accepted for publishing without major revisions being done to the submitted papers. Another major hurdle in relation to funding in Africa was that almost all research funding (70-90%) available in the region was from foreign agencies (Trotter *et al.*, 2014, p. 38), making the universities in the Southern African Development Community countries dependent upon such sources. However, it is very important for academic staff at the School of Medicine not to solely focus on funding coming to the University or from the Government but rather that, in addition, to advocating for increases in research funding from the University or Government, it is critical that the academic staff, themselves proactively look towards other funding agencies to finance their knowledge production activities. This is very important to advance research collaboration which is one of the factors in research impact measurement both at individual researcher and institutional levels.

### **6.2. Lack of sufficient time**

About 26 (63.4%) of the respondents had indicated that they lacked sufficient time to do research. Research is a time-consuming activity and yet lecturers are required to perform several functions: lecturing, community service, administrative functions in addition to actually carrying out research. As if that were not enough, after the research has been carried out, their research needs to find itself in different publication outlets such as books and journals. All these activities require an investment of time and lack of it has been a major barrier to research output in several universities (Sabzwari, Kauser and Khuwaja, 2009, p. 6; Okendo, 2018, p. 205; Uwizeye *et al.*, 2022).

### **6.3. Lack of incentives for knowledge production, diffusion and utilisation**

Incentives for knowledge production, diffusion and utilisation are critical to the success of any university that wants to count itself as a research institution. The study findings show that 19 (46.3%) of the respondents felt that there were no incentives for knowledge production, diffusion

and utilisation. At the University of Nairobi in Kenya, incentivisation was recognised as a predictor for research production. As a result, it instituted measures that recognised those academic staff that had excelled in research activities. The measures instituted included amongst others; “appreciation letters, financial rewards or promotion (Muia and Oringo, 2016, p. 1790). Against this background, the University of Zambia gives incentives for increased research output; cardinal among them is academic promotion which is also linked to increased salary earnings once someone has been promoted. The university also grants staff that have worked for more than five years one year of sabbatical leave, which can be spent at an institution of their choice. It is expected that during that one year of sabbatical leave, such staff will be engaged in activities that lead to research publications. Similarly, in Kenya, it was further contended that in order to encourage research productivity, staff needed to have lower workloads, a conducive work environment, perform less administrative functions, and to be given leave to carry out research. In addition university authorities are required to provide funds to its academic staff members to conduct research (Muia and Oringo, 2016, p. 1790).

### **6.3. *Lack of Internet access***

Knowledge production requires access to the Internet. Some respondents (16 39%) indicated that they lacked access to the Internet and as a result their research productivity was affected. One of the key ingredients in knowledge production is access to relevant research output that should feed in the process; and some of the information resources that have been used heavily in the past is the library. The problems of the University of Zambia Library having inadequate support of funding and consequently not being up to date in buying books and subscriptions to journals are well documented (Simui and Kanyengo, 2004; Kanyengo, 2007a, 2009b; Kanyengo and Hoppenbrouwer, 2007; Monde, Kanyengo and Akakandelwa, 2017). Additionally, this lack of support was one of the major findings in the Bobby Bwalya government commission of inquiry (Government of the Republic of Zambia, 1998).

However, interviews with staff from the Centre for Information and Communication Technologies (CICT) department indicates that almost all staff have internet access points in their offices connected either through wireless or Local Area Network (LAN); perhaps what is lacking might be the computers or indeed laptops to connect to the internet. In today’s digital environment, the Internet has in a way become the library where people can access the requisite knowledge. Consequently, the Internet has become a factor in research productivity in any university. In a study on research productivity in the Internet age, it was found that there is a positive relationship between the Internet and the increased research output of researchers (Barjak, 2006, p. 357). In recognition of the important role that the Internet plays in an institution’s life, the Geneva Declaration of Principles and Plan of Action was adopted at the World Summit on the Information Society in December 2003. In that declaration, the member countries agreed and the signatories affirmed that they would “promote affordable and reliable high-speed Internet connection for all universities and research institutions to support their critical role in information and knowledge production, education and training, and to support the establishment of partnerships, cooperation and networking between these institutions” (World Summit on the Information Society (WSIS), 2003, p. 25).

### **6.4. *Lack of appropriate reading materials***

Knowledge production, diffusion and utilisation require access to the appropriate reading materials. Knowledge production in essence is a cycle which requires the input of the relevant

knowledge before new knowledge can be produced. Several respondents (11, 26.8%) thought that lack of appropriate reading materials is what was preventing them from engaging in knowledge production activities. A study in Tanzania agreed with this finding, that access to library facilities has an influence on knowledge productivity (Okendo, 2018, p. 207). This assertion that, researchers in some parts of Africa lack access to the required reading materials has further been supported:

*“Web of Science and Medline journals are not readily available to Southern African universities, either in libraries or on the Internet. Thus academics, researchers and students face a triple bind: (a) low accessibility in relation to academic journals in general; (b) low accessibility to journals from the region; and (c) low accessibility of subject matter relevant to regional development concerns”* (Abrahams, Burke and Mouton, 2009, p. 28).

Lack of access to reading materials (books and journals) as well as libraries not having adequate resources to maintain subscriptions to print and online materials has earlier been alluded to (Simui and Kanyengo, 2004; Kanyengo, 2007b, 2009b; Zulu, Makondo and Kanyengo, 2018). This fundamental lack of reading materials meant that lecturers lacked the necessary information support for their research activities. Similarly, in an acknowledgement of this lack of access to reading materials especially in the developing world the World Summit on the Information Society in 2003 reaffirmed the need for access when they declared that, in recognition of this lack of access to reading materials especially in the developing world, it was necessary to:

*Promote electronic publishing, differential pricing and open access initiatives to make scientific information affordable and accessible in all countries on an equitable basis; Promote the use of peer-to-peer technology to share scientific knowledge and pre-prints and reprints written by scientific authors who have waived their right to payment* (World Summit on the Information Society (WSIS), 2003, p. 25).

### **6.5. Lack of publication outlets**

Publication outlets are always a problem for authors from the developing world especially those from Africa. In the study findings, some respondents (9, 22%) felt that they did not have access to the relevant publication outlets and therefore this was impacting negatively on their publishing potential. In academia the prevalent form of publication outlets are journals, conferences and books in that order, whether in print or digital. However, publishing avenues in most of the African countries are lacking. If they are there, the journals are not published frequently and most often the information they contain is outdated by the time they appear; making it very difficult for researchers to trust the local journals as their publication frequency is not guaranteed. As a result, academic staff are forced to look elsewhere for publication outlets, most often abroad, outside their countries or in countries based in the Northern hemisphere.

Publishing in top rated academic journals is not just prestigious for academic staff, but it has implications on academic promotions and consequently the amount of salary one earns. This is because some universities may award more points for highly rated scholarly journals. Nevertheless, getting a paper published in these high rated journals is not an easy task, as there is a very high competition; again, as already argued, the journal is very appealing as a publication

outlet because its turnaround is faster than the book. That is why they are the supreme publication mediums and most researchers strive to “publish in rated international journals, despite the challenges of having an article accepted. This view appears to apply across all disciplines” (Abrahams, Burke and Mouton, 2009, p. 20). It has further been argued that “many scholars from sub-Saharan Africa never get to publish their articles in top refereed international journals, leading to invisibility of scholarly publishing from sub-Saharan Africa” (Ondari-Okemwa, 2007). This invisibility may result in low research impact (Abrahams, Burke and Mouton, 2009, p. 28). These challenges may lead to frustrations amongst academic staff and researchers in general.

#### **6.6. *Lack of Internet research skills***

A small percentage of academic staff (7, 17.1%) indicated that they lacked Internet research skills. Internet research skills are important in today’s context as these are the skills that are key to researchers in producing publications. In Nigeria, there was a general low-level training in the use of information services for research as well as the training in research skills amongst surveyed scientists in research and development organisations. Additionally, they had challenges accessing the Internet as over 80% of them had to access the Internet from cyber cafes, a situation that is not tenable and conducive to knowledge production (Adeyinka, 2014, p. 57). This is an indication that the institutions are not putting investments into Internet access as a tool that could be utilised by the institution to not only improve research productivity but also to be utilised for other purposes such as communication and collaboration. Indeed, as contended by Sooryamoorthy and Shrum (2007, p. 734) “collaboration occurs among scientists from different continents and cultures through a spectrum of technologies, producing a mix of knowledge, products, and solutions. In the research process, collaboration is viewed as producing results through the transfer and sharing of information, skills, and expertise”, but for this collaboration to work well, it will require access to good internet.

#### **6.7. *Lack of interest in knowledge production, diffusion and utilisation***

There was lack of interest in knowledge production, diffusion and utilisation (2, 4.9%), although relatively small in number. This finding is very problematic as it is a requirement for all persons employed as academic staff at the University of Zambia to be involved in research and knowledge production. Therefore one wonders how someone who has no interest in knowledge production will be employed in a job whose primary role is knowledge production. It may mean that some of these people are the ones who found themselves accidentally as lecturers perhaps lured by the benefits of working at the University of Zambia, benefits which they cannot get from elsewhere.

It is hoped that engagement in research may eventually lead to increased research output for both the individual researcher and the institution as a whole. Indeed, the academic promotions tool of the University of Zambia places emphasis on research and research output, in addition to other criterias. A study in Vietnam also found that some of the academic staff surveyed took research as an “obligation (normative motivation) rather than because of a research interest and passion” (Nguyen, 2015, p. 197). They were really not interested in research per se, and indicated that their university was primarily a research oriented university. This lack of interest may have forced some researchers with demonstrable exceptional performance to not apply themselves fully and may have resulted in their own individual scientific work not translating into institutional research capacity over time (Abrahams, Burke and Mouton, 2009, p. 32). However,

these individual endeavours may later act as a springboard for research platforms in their various institutions.

### **6.8. Heavy workload**

Indeed the literature reviewed indicates that a heavy workload, of a lot of students to teach combined with the responsibilities of lecturing, tutoring, examinations and supervision made it extremely difficult for the academic staff to allocate some of their time to be engaged in knowledge production activities. Certainly, views expressed by the respondents were that they had little time for research as most of the time they had was spent on teaching. This has been exacerbated by the huge numbers of students that keep on increasing every year (Kanyengo, 2009a, 2020) This assertion was explored by Trotter et al. and they determined that “heavy teaching and administrative loads hinder research production in Southern African universities” (Trotter et al., 2014: 224); which is also similar to the findings by Kulyambanino (2016, p. 52) who alludes to the fact that 129 (78.7%) respondents in her research mentioned that overloads in teaching had impacted on the research abilities of academic staff at the University of Zambia.

### **6.9. Lack of peer reviewers and editors for locally produced knowledge products**

Peer review is important in establishing a quality assurance mechanism for all scholarly published research. This is more so for African authored and published papers as they struggle to find their presence on the international academic scene. However, the study findings indicate that the peer reviewers are not always responsive on time and therefore cause a lot of delays in publishing of journal issues. It has already been recognized as far back as the 1990s that this is a major hindrance to up to date scholarly publishing in many African countries, leading some to assert that “editors and their peer review process are a reason for the death of new knowledge generation of scholarship” (Sebola, 2018, p. 10) in Africa.

### **6.10. Lack of Mentorship**

Mentorship of the young is necessary in order for the young researchers to gain skills in research, authorship and scholarly publishing. However, most often there is a lack of mentorship at African universities. Young researchers are often left alone to learn the processes of academic publishing on their own. It has been highlighted that there is a general lack of mentorship programmes, and if there is any mentorship activity taking place, it is often ad hoc, and haphazard, without any formal institutional plans. As a result there is no knowledge of what is formally expected of the mentors and mentees; and often there is no time that is allocated, so both mentee and mentors complained of lack of time (Kumwenda *et al.*, 2017, p. 2; Nakanjako *et al.*, 2017, pp. 3–6; Ssemata *et al.*, 2017, pp. 4–8). The solutions suggested for these challenges on a global level are to offer “more level playing fields for new health researchers globally, changing mindsets in institutions that do not have a culture of mentorship and building collaboration not competition” (Cole *et al.*, 2015, p. 1093). Nevertheless, the success of any mentorship programme will be dependent on the commitment of both the mentee and mentor with the support of a conducive institutional environment (Sambunjak, Straus and Marusic, 2010, p. 77).

## **6.0. CONCLUSION**

The study sought to explore the factors affecting knowledge production, diffusion and utilisation in a university environment. The study affirmed that lack of funding was one of the major impediments to knowledge production, diffusion and utilisation in the University of Zambia

Medical. It observed complaints from the academic staff that the University of Zambia were not allocating and disbursing enough funds for research. It was further noted that lack of funding has been a recurrent problem at the University of Zambia and it is mostly likely, that this trajectory, of lack of funding from government and the University of Zambia for research, would continue in the near future. The academic staff also expressed a concern at the lack of sufficient time to engage in research as most of the time they were teaching due to the increased numbers of enrolments of students versus the available academic staff. Moreover, it was highlighted that there was a general lack of adequate research skilled staff and inadequate access to current peer reviewed research, both critical inputs in the knowledge production, diffusion and utilisation process.

Other challenges identified were chaotic distribution and marketing of knowledge products produced by the University of Zambia, shortage of peer reviewers and editors for locally produced knowledge products as there were no incentives (monetary) for the activities. Nonetheless, the university does recognise this type of work in its promotion criteria. It was also further found that the locally produced academic journals were not visible and discoverable locally or internationally. Further, mentorship of junior academic staff was also not available.

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