ASSOCIATION OF AFRICAN UNIVERSITIES

COREViP2019

Conference Of Rectors, Vice Chancellors & Presidents Of African Universities

ISSN : 2704-4858

THEME:
THE ROLE OF HIGHER EDUCATION INSTITUTIONS IN PROMOTING THE CONTINENTAL EDUCATION STRATEGY FOR AFRICA (CESA 16 - 25)

SELECTED PAPERS

Al-Azhar International Conference Center
Cairo, Egypt

July 8- 11, 2019

Selected Papers For **COREVIP 2019**

Table of Contents

Preface

The Association of African Universities (AAU) organized its 20th Conference of Rectors, Vice Chancellors and Presidents of African Universities (COREVIP) in Cairo, Egypt on July 8-11, under the theme "The Role of Higher Education in Promoting Continental Education Strategy for Africa."

COREVIP is one of the flagship programs of AAU that provides a platform for intellectual discourse which aims to reinforce inter-university co-operation. It is held every two years in a selected country where member universities are located. The 2019 COREVIP was successfully held under the Patronage of His Excellency Abdel Fattah El-Sisi, President of the Arab Republic of Egypt.

The conference program was structured to include plenary sessions; parallel sessions; and working group discussions. The highly engaging discourse focused on seven sub-themes of the conference. A review of AAU programs and its plan in the next two years were also undertaken during this event.

The conference theme inspired valuable debates and discussions that led to useful recommendations and interventions targeted at the AAU, Africa Universities, African Governments and the African Union Commission.

The vision of building a prosperous and peaceful Africa is deeply rooted in the development of Africa's human development capital. Education as the gateway to Africa development has led the African Union to promulgate various regional and continental educational agendas that address key issues of the continent's developmental challenges. Higher education as the panacea for Africa development will enable Africa to take its rightful place in global matters. In this respect, scientific papers were presented at the conference. These papers were subsequently peer-reviewed and what is contained in this volume as Selected Papers represents what has been approved for publication after a rigorous review process. It is hoped that these articles will highlight the contribution of higher education institutions in Africa to the strategic objectives of CESA.

The AAU is grateful for the financial and material support provided by the European Union, Sida, Carnegie Corporation, TVET Egypt, the Government

of the Arab Republic of Egypt and Al-Azhar University toward the organization of the 2019 COREVIP.

Finally, a unique thank you is extended to the authors, reviewers of the selected papers and all participants of the 20th Conference of Rectors, Vice Chancellors and Presidents (COREVIP) of African Universities.

Professor Etienne Ehile
Secretary General

Beyond the Enclave: Expediting the Challenges and Prospects of Young Girls Doing STEM Subjects in Public High Schools in Rural Zimbabwe

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ABSTRACT

This study was premised on two fundamental conceptions including that (1) Socioeconomic structures in rural schools and societies disfavour the success of girls and (2) the success of rural girls in STEM education carry the potential of resolving the long-standing challenge of rural underdevelopment. A mixed methods approach, with an imbedded/nested research design was used. Findings revealed that rural girls who pursue STEM education face a range of challenges including gender stereotypes, socio-cultural injustices, high costs associated with STEM education, poverty, lack of funding opportunities, poor curriculums, non fraternised subject combinations and infrastructural deficits. On the other hand, a number, of prospects were identified including a growing base of post high school career options, willingness of young women to inspire and motivate their counterparts to excel in STEM education among others.

Keywords: *Innovation, Challenges, Prospects, STEM, Technology.*

INTRODUCTION

Just like during the era of renaissance when philosophy and humanities were providing stimulus for socioeconomic growth and development; the success of modern economies is now dependent on the innovation and subsequent consumption of Science, Technology, Engineering and Mathematics (STEM) products and services (Atkinson & Mayo, 2010; Gonzalez & Kuenzi, 2012). Marginson, Tytler, Freeman and Roberts (2013) note that the success of STEM based economies lie in the ability of governments and the civil society to provide requisite support and funding for STEM educational programmes. The need to transition to STEM economies cannot be overemphasised. However, it is crucial to ensure that this transition does not leave anyone behind, particularly women who were largely left behind in previous development decades (Glass & Minnotte, 2010). Experiences from past developmental decades have shown that women play critical roles in marshalling family, community and indeed global development (Castells, 2010). It is therefore important to ensure their rightful participation in the current STEM movement. This paper explores the challenges and prospects of young girls doing stem subjects in selected rural public high schools in Zimbabwe.

Analysts are agreeable that the hope of transforming livelihoods in all polities of the world is incumbent on the ability of countries to generate new ideas and transform them (ideas) into goods and services for both their domestic and international markets (Bybee, 2013; Breiner, Harkness, Johnson & Koehler 2012). Correspondingly, Marginson, et al., (2013) aver that there is growing consensus among research communities that the survival for both developing and developed economies is now predicated on the ability of countries to design and maintain competitive STEM educational systems that can reliably supply competent, productive and innovative professionals. Given this backdrop, it is perhaps necessary to identify strategies to reinforce and promote the uptake of STEM education in developing countries. To this end, Mabhanda (2016) notes that for success, efforts aimed at inspiring the uptake of STEM education should start from the grassroots level where children in primary or even those in preschool should be exposed to the basics of technology. Correspondingly, Ejiwale (2013) writes that developing countries should emulate to achieve a state in which all learners, not just those who already have a passion for STEM professions have easy access and exposure to technology.

An Overview of Zimbabwe STEM Situation

Despite the many political, social and economic vicissitudes that have been impacting on Zimbabwe in the last two decades, the country has continued to vigorously

pursue a policy of supporting STEM education as a pillar for socioeconomic growth and development (Gadzirayi, Bongo, Ruyimbe, Bhukuvhani & Mucheri, 2016). Musiyandaka, Ranga and Kiwa (2013) note that in 2000, the former President of Zimbabwe, the late, Robert Gabriel Mugabe launched a highly ambitious Computerisation Programme whose scope was to capacitate disadvantaged schools with ICT equipment so as to ensure that learners in these schools are not left out from participating in the new technology based learning. Musiyandaka et al., (2016) further write that as of 2014 the Computerisation initiative had benefitted over 1000 rural and sub-urban schools. Additionally, Ngwenya, Pelser and Sibanda (2017) note that in 2016, the government of Zimbabwe introduced a STEM Scholarship Programme in which the government through the Ministry of Higher and Tertiary Education, Science and Technology Development volunteered to sponsor learners who were willing and able to take STEM subjects at Advanced level in public schools. These scholars noted that within the first three months of the initiative, more than 3400 learners had registered. Additionally, Zvavahera (2014) poses that the Zimbabwean government through its Department of Scholarships continue to provide a significant number of STEM scholarships to underprivileged students to study at international universities under the Presidential Scholarships scheme.

PROBLEM STATEMENT

Socioeconomic development stakeholders in Zimbabwe are increasingly warming up to the idea of embracing Science, Technology, Engineering, and Mathematics (STEM) as key drivers for socioeconomic development (Phelan, Harding, & Harper-Leatherman, 2017). This awakening and the subsequent interest in developing the STEM sector has exposed some inherent gender disparities within the STEM education system in the country. Analysts have observed that more boys than girls receive financial aid to pursue STEM education (Sahin, 2015; Dekeza & Kufakunesu, 2017). More so, abounding evidence shows that generally girls who undertake STEM education experience inordinate disparagement sometimes from people who should naturally be seen to be encouraging them (Dekeza & Kufakunesu, 2017). Additionally, a multitude of restrictive socio-economic and cultural factors which impede the success of girls in STEM education has been noted in various studies (Sahin, 2015). Inopportunely, rural girls are often some of the most disenfranchised pursers of STEM education. This paper provides an account of the challenges and prospects of rural high school girls who were doing STEM subjects in selected public high schools.

PURPOSE OF THE STUDY

This study was designed to explore the challenges and respective success factors associated with young girls doing STEM subjects in Zimbabwean rural public high schools. The primary aim of the undertaking the study was to stimulate much needed debates around women's rightful participation in the emerging STEM based economies of the world.

LITERATURE REVIEW

Conceptualising STEM Education

According to Tsupros (as cited in Ejiwale, 2013), "STEM education is an interdisciplinary approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering and mathematics in contexts that make connections between school, community, work, and the global enterprise enabling the development of STEM literacy and with it the ability to compete in modern, technology driven economies". Concurringly, Brown, Brown, Reardon and Merrill (as cited in Ejiwale, 2013) in aver that STEM education is a standards-based, meta-discipline residing at the school level where teachers of science, technology, engineering, and mathematics fuse their synergies towards teaching an integrated approach to teaching and learning, where discipline-specific content is not divided, but addressed and treated as one lively, fluid study. Mabhanda (2016) adds that although the concept of STEM education entails subject-specific learning; it also involves directed efforts of stimulating a culture of inquiring minds, logical reasoning and collaboration skills. More so, Ejiwale (2013) writes that apart from developing inquisitive and innovative minds, STEM education also emulates to develop a STEM literate society, one in which everyone is able to utilise technological products to improve efficiency in both domestic and industrial production.

Challenges Confronting STEM Education in Zimbabwe

Ngwenya, Pelser and Sibanda (2017) write that in Zimbabwe as it is in many other developing countries, STEM education has some profound challenges that have continued to threaten the growth and survival of the field. Mabhanda (2016) adds that the prospects of STEM in Zimbabwe are under siege by deteriorating economic fundamentals in the country that has seen many educational institutions failing to build and maintain requisite STEM infrastructure. Furthermore, De Villiers and Weda, (2017) pose that STEM education in Zimbabwe is being grounded by the massive exodus of qualified teachers who are going to the diaspora in search

of greener pastures. According to Ngwenya, Pelser, and Sibanda (2017), faced with a crippling shortage of qualified STEM teachers, the government of Zimbabwe has resorted to hiring semi skilled persons to teach STEM subjects in schools. In lieu of this, Sithole, Chiyaka, McCarthy, Mupinga, Bucklein and Kibirige (2017) note that unqualified STEM teachers lack the capacity to stimulate and motivate learners to develop interest in STEM careers. Additionally, Sithole et al. (2017) pose that the growth of STEM education in Zimbabwe is being hampered by poorly designed and unsynchronised curriculums as well as poor subjects' content. Ejiwale (2013) argues that poor synchronisation of subject's hamper collaboration and therefore eliminates chances of using STEM as a stepping ladder to innovation.

Additionally, Gadzirayi, Bongo, Ruyimbe, Bhukuvhani and Mucheri (2016) found out that more than 50% of respondents in their study exhibited low levels of interest and satisfaction in science classes. These scholars attributed the disinterest and low satisfaction in STEM education to embryonic negative attitude of society and its concomitant stereotypes towards STEM. Secondly, Gadzirayi et al., (2016) argue that the low interest in STEM education validates the negative connotations of the bottleneck system used by Zimbabwean schools in dividing learners into different disciplines according to identified strengths. Concurringly, Ngwenya et al. (2017), note that another factor which is destabilising STEM education in Zimbabwe is the current strategy of focusing on supporting STEM education at high school level only. Analysts have noted that for sustainability, the interest of learners in STEM need to be harnessed from as young as pre-school and then be nurtured along the way (Han, Capraro & Capraro, 2015; Gadzirayi et al., 2016).

The Plight of the Girl Child Doing STEM Subjects in Zimbabwe

Inopportunely, a number of challenges have been identified to be militating against the participation of rural girls in the STEM discourse. Dekeza and Kufakunesu (2017), write that despite the overture by the Zimbabwean government to sponsor students who were willing and able to do STEM subjects at high school, very few girls have benefited. This is because of a number of factors including gender stereotypes which tend to discourage females from aspiring to achieve STEM careers (Dekeza & Kufakunesu, 2017); economic hardships which force young girls to drop out of school (Ngara, 2017); the phenomenon of teenage pregnancy (Ngara, 2017) and poor career guidance which results in girls being encouraged to pursue traditional feminine careers such as nursing and teaching at the expense of their potential in STEM (Phelan, Harding & Harper-Leatherman, 2017). Lloyd, Gore, Holmes, Smith and Fray, (2018) add that, the prospects of young girls in STEM is also hampered by absenteeism from school due to a number of factors including menstrual periods, the

need to be caregivers to ailing family members, flooded rivers, and sometimes the need to join the family in food for work schemes.

Prospect of STEM in Zimbabwe

Being a highly literate society, Zimbabwe stands to gain from harnessing opportunities embedded within the STEM sector. Experts have noted that humanised innovations within the STEM sector bear the potential of drawing the country out of the doldrums of poverty, poor service delivery and poor industrialisation (Sahin, 2015; Dekeza & Kufakunesu, 2017). Sahin, (2015) poses that STEM have shown great potential of imparting employable post secondary school skills which go a long way in resolving the challenge of unemployment. Similarly, Levine (2019) writes that STEM careers hold high status and have been found to offer high job satisfaction, social status and high incomes. Additionally, Ngara, (2017) notes that globally, STEM have been noted to carry the potential of stimulating economic growth by margins in excess of between 15 up to 20 percentage points within the next coming decade. According to Ngara (2017) this projection is lucrative for some African economies including Zimbabwe which already have highly literate populations that can easily fit within the broader scope of STEM and can easily create requisite collaborations to support the production and consumption of STEM products and services. Furthermore, STEM experts have indicated that STEM careers are future orientated with economic scales visibly tilting in their favour (LeVine, 2019). In their study, Waaijer, Teelken, Wouters and van der Weijden (2018) found that STEM graduates face the least risk of being unemployed in comparison to their peers from other fields post university studies. Langdon, McKittrick, Beede, Khan and Doms (2011) assert that STEM trained graduates in the USA earn an average of 26% more incomes in comparison to their non-STEM counterparts.

RESEARCH METHODOLOGY

The study used a mixed methods methodology. Despite mixing methods, the study was qualitative heavy and quantitative light, implying that the qualitative component of the study was dominant while the quantitative aspect was secondary (Creswell, 2009). An imbedded/nested research design was used. This implies that quantitative aspects of the study were largely collapsed within a pre-dominantly qualitative framework (Morse, 2016). Purposive sampling was used for selecting participants for the qualitative component of the study and respondents to the mini-survey questionnaire were randomly selected. A total of 108 samples including 60 respondents to the survey, 15 in-depth interview participants, 3 key informants and 30 focus group discussion participants. In accordance with Cole and Trinh's (2017)

assertion, secondary data sources including newspaper and journal articles, internet sources and library books were used to ground study findings within a rich context of literature. Thematic data analysis was used in analysing qualitative data sets while descriptive statistics were used in analysing quantitative data (Creswell, 2009).

PRESENTATION AND DISCUSSION OF FINDINGS

This study sought to expedite the challenges and prospects of young girls who were doing STEM subjects in a few selected rural high schools in Zimbabwe. Multiple socio-cultural, economic, systemic and institutional challenges were found to be confounding with the ability of the girls to succeed in STEM education. On the brighter side, some lucrative and inspiring attitudes, trends and opportunities for the girls who were doing or those who were considering pursing STEM education and careers were also identified. The ensuing sections present the findings of the study.

Gender Stereotypes

Participants in focus groups and those who participated in in-depth interviews concurred that one of the major challenge that was stifling young girls from pursuing STEM careers or succeeding in STEM education were the deeply entrenched socio-cultural beliefs and taboos which propagated the view that STEM careers were for boys. One girl in a focus group said:

> *Although I am doing these STEM subjects currently, my parents at home are not happy with my subject choice, they believe that it's for boys, they just can't imagine me becoming a doctor or an engineer.*

Similar sentiments were echoed by several focus group discussion members and in-depth interview participants who expressed their fear for undertaking STEM subjects which they noted to be difficult. Despite the acknowledgement by participants that STEM subjects were generally difficult, it seemed that this fear and the general negative perceptions of STEM studies was being propagated by the constant negative feedback from the girls' families and significant others who had very little faith in STEM education. One girl said:

> *I think I have what it takes to be an engineer, or even a medical doctor, however, at home and even some teachers here tend to repeatedly instil fear in me, imagine being told that you won't make, at some point you may start to believe that you are doomed.*

Furthermore, an interface between the qualitative narratives of study participants and statistical evidence gathered from the mini-survey showed that apart from feeling as if they were "inept" and "were not cut for science studies", the girls who were doing STEM subjects were constantly facing inordinate gender stereotypes. Statistics from the mini survey revealed that 67% of the respondents had encountered some form of gender stereotype both at school and the community on the basis of their subject combination. Additionally, interviewees and focus group participants reported a number of euphemisms and expletives they were encountering at school, in the community and at times at their homes.

The above findings get credence from Grown, Addison and Tarp (2016) and Sahin (2015) whose studies established that young women pursuing STEM education and careers encounter discouragement by their societies and families who inordinately criticise them as being over ambitious.

Proverbial Feminine Chores an Encumbrance to the success of girls in STEM
Study findings revealed that the girls who were pursuing STEM education were unfairly disadvantaged by being denied the freedom of staying at school after conventional schooling hours to undertake individual studies and group discussions. Participants indicated they were compulsorily mandated to rush home after school so that they can help their mothers with household chores. Inopportunely, the requirement to rush home to help was not universal as it was largely not applicable to boys. The following expressions were common among interviewees and focus group participants:

> *Everyday boys remain here at school studying and "we" girls have to rush home to help our mothers to cook and do other household chores.....*

This finding is not unique to this study, in their ethnographic study, Chirimuuta, Bhukuvhani and Gudhlanga (2012) established that tradition and culture in many African homes demands that girl children always be available to assist their mothers with household chores. Kairiza, Kiprono and Magadzire (2017) also write that gender roles in African homes constitute a form of disempowerment of women as most women tend to be relegated to some menial tasks which are labour intensive and time consuming such that women are deprived of time for personal development.

Unwanted attention and divided focus: A malignant to the success of girls in STEM Education

Key informants in the study revealed that one of the common challenges faced by young girls doing STEM in Zimbabwean high schools was un-solicitated and unwanted attention which distracts them from focusing on their studies resulting in high feminine dropouts or failure. One interviewed key informant who was a teacher mentioned that:

> *I think being in a science class draws attention to these young girls and many of them fail to manage this limelight resulting in loss of focus*

Secondary data sources from the participating schools showed that each school had an average of 3 dropouts per annum with pregnancy, sickness and marriages being the top three reasons for dropping out of school among girls. Gordon (2017) affirms that young women face the challenge of being the target of patriarchal attitudes. This scholar adds that wealthy males are largely attracted to successful young women whom they want to flaunt as some form of trophy. Inopportunely, the unhealthy and unwarranted attention given to the young girls coupled together with the use of material resources to entice them often results in them being drawn out of their educational and professional careers in pursuit of love and marriage.

Lack of affordability of STEM Education

Study findings proved that the socioeconomic backgrounds of participants which were largely characterised by poverty were limiting their affordability of STEM education. Notably, the tuition fees for STEM learners were significantly higher than those of students from other non-STEM disciplines. Precisely, learners who were doing STEM subjects were paying more fees in addition to other non fees costs. One key informant had the following to say:

> *It's sad that STEM education is slowly being commoditised by both public and private schools. Schools are charging more for STEM enrolled learners in comparison to those enrolled in other subjects. While it's justifiable to say that STEM students require extra facilities and equipment for experiments, I think it's retrogressive for the government continue with the STEM rhetoric without subsiding it for affordability by the underprivileged especially those in rural areas.*

The above captioned finding finds support from findings of Gadzirayi, Bongo, Ruyimbe, Bhukuvhani and Mucheri's (2016) holistic diagnostic study on the status of STEM in Zimbabwe which noted that a lot of willing and well capacitated STEM

learners were being locked out of the system by lack of funds to sustain the often prolonged STEM educational careers. These scholars also found that a lot of young Zimbabweans who pursue STEM education often drop out before reaching the ultimate levels such as master's and PhDs and Professorships in the sector due to financial bottlenecks.

Economics of the Stomach and the Girl Child undertaking STEM Education
Significantly many participants referred to the prevailing economic challenges in the country and noted their desire to quickly finish their studies and lessen the financial burden on their families by joining the labour market so that they may help in supporting their siblings and themselves. One key informant said:

> *These are unusual times; educational and career options are mostly made based on what can quickly bring food on the table, unfortunately this is sometimes happening against the best interests of very talented learners*

Another key informant mentioned that:

> *Rural families often consider a girl child as an asset, they want to get her married, reduce on their expenditure on her and earn income from marring her.*

Focus group participants also concurred that economic hardships in the country was a major stumbling block in their pursuit of STEM education and careers. Additionally, findings from the survey revealed that the majority (67%) of the respondents believed that they were likely to fail their studies due to lack of affordability of requisite textbooks and money to pay for extra tutorials.

Available literature depicts that although economic hardships are often generalised to all members of society, poverty and its concomitant exclusionary effects tend to be more pronounced among females who are often disenfranchised and have their personal development opportunities curtailed or scarified for the greater good of their families. This according to Young (2017) perpetuates the subjugation of women.
Nature's Biological Clock and the Girl Child Doing STEM

The study revealed sad finding pertaining to school attendance patterns of the girls who were doing STEM subjects. School attendance registers for the selected schools showed that the girls were missing school for an average of 2 days per month with the maximum absence being 5 days and minimum being 2 days. Interviewed participants intimated that one of the major reasons for their high absenteeism was that they

were uncomfortable coming to school during their menstrual period. This was compounded by the fact that the cost of sanitary wear was beyond the affordability of many. This was therefore forcing some girls to resort to using traditional methods of reliving themselves including using tree leaves, cloths and cotton swabs. One girl said:

> *Sanitary pads are expensive, some of us can't afford them, we use some other methods which are uncomfortable to come to school with*

According to Sommer et al., (2016) the lack of affordability of sanitary wear often means that girls are sometimes grounded until their periods are over. It is unconceivable and regrettable that the country is losing potential feminine STEM professional to menstruation.

Low, Erratic and Non-Availability of funding Opportunities

Study findings established that the girls who were doing STEM subjects were facing the challenge of lack of funding. Results from the survey showed that 55% of the total respondents were self sponsoring (*that is their tuition was catered for by their parents or extended families*). On the other hand, the government and the private sector were only sponsoring 27% (Basic Education Assistance Module + STEM Scholarship scheme) and 18% were sponsored by the private sector. These figures reveal that the state of funding for STEM education for girls in rural Zimbabwe is very low. This finding was also confirmed by key informants who noted that rural schools cannot meaningfully contribute to the STEM discourse in the country without sustainable, reliable and adequate funding. The key informants further noted that without sustainable funding, rural girls will continue to be discouraged and in worst circumstance forbid them from taking on STEM education.

Gadzirayi, et al., (2016) established that the bulk of developing countries still lack the capacity to bankroll the development of STEM education particularly building requisite infrastructures. Inopportunely, Maltese and Tai (2011) note that for STEM education to be impactful there is need for adequate and sustainable funding to firstly train professionals and providing financial support to stimulate innovation and research. Without funding, STEM education institutions risk producing half baked professionals whose only ability will be operating and servicing equipment designed elsewhere without the capacity of inventing anything for their domestic markets (Maltese & Tai, 2011).

Poor Subject Combinations and Lack of Career Guidance

Apart from the socio-cultural and economic hurdles, the study unearthed some

institutional and operational challenges whose impacts were devastating to the prospects of rural girls doing STEM subjects in the selected rural schools. The study found that all the investigated schools did not have adequate or requisite STEM personnel. The scarcity in human resources was being compensated for by allowing students to take on subjects that do not necessarily complement nor fit within the true scope of STEM.

The mini-survey findings showed that of the 60 students who were selected to participate in the study on the basis that they were doing STEM subjects, 19 of them had subject combinations which included commercial and arts subjects in addition to purely STEM subjects. This finding corroborates that of Chibowora (2018) who writes that in some instances, high school learners, especially in poorly resourced schools and those in newly established private colleges enrol for pseudo STEM subjects. Interestingly, some of the learners were quite aware that they were not doing STEM subject combinations; they referred to their multidisciplinary subjects as a "collection" instead of a "combination".

The researchers further observed that some of the girls who were doing STEM subjects were clueless regarding potential career options relevant for their current subjects' combinations. One major and typical example relates to a girl who was doing the so called "collection" including Mathematics, Accounting and Biology and did not know of a career path to follow post high school. Equally regrettable, some survey respondents, especially those with "subject collections" returned their questionnaires without answering the question on career option(s) they were emulating. Perhaps this exposes lack of understanding regarding what STEM really means and vindicates van Tuijl and van der Molen's (2016) assertion that secondary school learners in developing countries lack exposure in terms of their career guidance; they choose their career paths based on very limited knowledge and alternatives.

Infrastructural and other Resource Deficits

Additionally, the study unravelled that at institutional level, the selected schools were facing dire infrastructural deficits. It was noted that some schools did not have well equipped laboratories to conduct experiments hence in some cases, learners and teachers would go to neighbouring schools to conduct experiments and even to write final national examinations. Furthermore, key informants, focus group participants and in-depth interview participants largely concurred there was a general crisis of STEM textbooks in all the selected schools. Key informants intimated that they were in some instances forced to teach substandard content due to unavailability of books

and this often results in poor grades. These findings were corroborated by those of Muwaniki and Wedekind (2018) who established that despite being one of the leading countries in terms regional literacy rates, ever since the advent of the economic woes, the Zimbabwe's educational institutions have continued to face critical shortages of pertinent operational resources.

SYSTEMIC CHALLENGES

The last set of challenges which were impacting on girls who were enrolled in STEM education was systemic or macro in nature. These included complains by key informants that the current syllabuses were poorly designed such that the entire system is producing semi literate STEM high school graduates. Another systemic challenge that was largely condemned by participants was policy inconsistencies by the government in terms of its support for STEM. Participants noted that in 2016, they welcomed the new programme by the Ministry of Higher and Tertiary Education, Science and Technology Development; however, after the change of the government at the end of 2017, the programme was terminated. This according to key informants negatively impacted on STEM enrolment momentum especially that of girls. According to Chirimuuta, Bhukuvhani and Gudhlanga (2012) the Zimbabwean education system is riled by many challenges owing to slow policy formulation, implementation and management.

PROSPECTS OF GIRLS UNDERTAKING IN STEM EDUCATION IN ZIMBABWE

Despite the high staked challenges faced by young girls who were undertaking STEM education in selected rural schools, this study also established a few pointers that there is hope for girls and young women in the STEM sector. Study participants, particularly, key informants noted that despite the many challenges besetting rural schools they have continued to thrive. Ensuing are some of the success factor of STEM education among rural girls.

Young Women ploughing back into the growth of STEM in rural schools

Study findings have shown that there were some young women who attained STEM education and were philanthropically availing themselves to their former high schools to mentor younger learners. Interviewed learners noted that seeing other girls who walked the same bumpy road they were currently travelling was motivating them into believing that it is possible to reach the high echelons of STEM studies. One key informant said:

> *We have our former students who are coming back to support their siblings to excel in STEM. There is this one girl, although she is still in university, she has taken it upon herself to come here almost every holiday to volunteer giving our learners free extra lessons in mathematics and physics. This simply means young women produced here in our rural schools are taking the initiative to stimulate and motivate their younger siblings to develop interest in STEM*

The above statement inspires hope for the future of STEM among rural girls and young women in general in the long term. For several decades now, analysts and international gender focused organisations have been calling women to champion each other's empowerment and development (Klugman, Hanmer, Twigg, Hasan, McCleary-Sills & Santamaria, 2014)

Qualitative improvements in girls' academic performance in STEM subjects

A review of secondary data sources from the three participating schools showed that there was gradual but significant improvement in the quality of both singular subject and overall subject combination pass rates for girls who were enrolled in purely STEM subjects. More so, secondary data sources revealed that there was a gradual increase in girls' enrolment in two of the participating schools over a three years period prior to the cancellation of the STEM scholarship programme, however thereafter it remained stagnant.

Improving Post-High School Academic and Career Avenues

Study findings noted that there were increasingly more post high school academic opportunities for high school leavers who did STEM subjects. A perusal of the internet showed a few polytechnic colleges which take STEM high school leavers with lower grades. More so, a number of companies in the STEM sector were advertising apprenticeships, some of which were specifically writing that that young women are encouraged to apply (www.thezimbabwemail.com; Muwaniki & Wedekind, 2018). Additionally, there were newspaper reports indicating that local universities were receiving funding to expand their STEM education sector by widening the number of STEM degrees and subsequently increase their enrolment (Muwaniki & Wedekind, 2018).

Families warming up to the fact that STEM constitutes Careers for the Future

The study also noted that increasingly more families and individuals in society are warming up to the reality of STEM education being the basis of the current and future careers. In their studies, Maltese and Tai (2011) and Cole and Espinoza (2008) found out that increasingly many families were getting to appreciate the fact that STEM careers are on demand and those who pursue them tend to earn more both

in the short and long term. More so, Maltese and Tai's (2011) study established that parents of university students who were doing STEM programmes had very high hopes of their children getting jobs soon after completing their studies in comparison to those whose children were in non-STEM fields of study. Findings by the above mention's scholars were corroborated by utterances by focus group participants of this study who revealed the following:

> *I think my family is supportive of me doing STEM subjects, ever since I started, my father always refers to me as "his medical doctor"*
>
> *Ha-ha-ha, even my mom and dad call me their engineer*

While the above statement seems to reveal petty talk between parents and their daughters, it also exposes some changing attitudes of families towards the idea of girl children pursuing STEM careers.

CONCLUSION

A myriad of socio-cultural, economic, institutional and systemic hurdles has been found to be militating against the success of rural girls pursuing STEM education. However, despite the insidious impacts of these challenges, a number of success factors which points to a glimmering future for girls' pursing STEM education have also been established.

RECOMMENDATIONS

The challenges of rural girls pursuing STEM education are surmountable if all stakeholders are to commit themselves to this cause. The following are some recommendations that may be considered in addressing some of these challenges and also strengthening the identified success factors.

- Initiate deliberately gendered enrolment strategies in rural school, this may be accompanied by incentives such as STEM scholarships specifically targeting girls
- Government should enter into partnerships with countries that are doing well in STEM. Such partnerships must target rural schools with the primary point of engagement/partnership being building requisite infrastructure and curriculum development
- Plough-Back initiatives such as the one by one former rural STEM student who is volunteering to teach learners at her former school should be supported with

resources by the government and the private sector with interests in the STEM sector. Perhaps it will be more effective if authorities in the STEM sector would designate a national or even international STEM Plough-Back day in which influential persons go back and inspire girls to persevere in their pursuance of STEM careers

- Government ought to provide conditional university and teachers college scholarships to develop STEM teachers who will be mandated to stay in the country for a certain period after completing their studies
- Government and Schools Development Committees must urgently address issues of accommodation and living conditions for rural teachers to ensure skills retention
- There is need for extensive marketing of STEM education starting from pre-schools up to the highest possible level

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Sub-Theme 2: *TVET Opportunities at Tertiary Levels and Strengthen Linkage between World of Work and Education and Training Systems*

Entrepreneurial Spirit of TVET Graduates as the Engine of Innovation — A Comparative Study between German Speaking Countries and Emerging Countries (Represented by Ethiopia)

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ABSTRACT

In many emerging countries the TVET system has been implemented in order to qualify young people for the world of work and to leave poverty behind. In many of these countries TVET success stories from Europe are told. However, in most of the emerging countries TVET has not gained momentum yet - as expected. This research will tighten the investigation on 5 factors which will be compared between the TVET system in German speaking countries and developing/emerging countries – represented by Ethiopia. The selected factors are the purpose assigned to the TVET system, the structure of the TVET system, the innovation approach and entrepreneurship education as well as the preconditions to become a TVET teacher/instructor. The analysis of these factors should demonstrate a disaggregated perspective the TVET success stories told from the German speaking countries.

Keywords: *entrepreneurship training, framework curriculum, purpose of TVET, structure of TVET, TVET teachers and instructors*

BACKGROUND

In general, Europe sees until today 3 different approach of vocational education: (1) the liberal market model in the UK, (2) the state regulated model in France and (3) the dual corporate model in Germany and Austria (Cedefop, 2004, p. 9). Switzerland as another German speaking country follows a similar approach.

The origin of the dual vocational education dates back to 1870 and can be understood as the introduction of an obligatory continuing (vocational) school for the youth in order to overcome the worsening of the living conditions caused by the rapid demographic growth. Primary school teachers managed the advanced training courses at that time (Becker, 1997). Other reasons for the introduction of traditional craft education and training in the German speaking area is seen in (1) the freedom of employment, (2) the need for skilled workers in industrial and administrative positions and (3) the workers' movement was becoming political movement that governments had to react and regarded the traditional world of life and work in the craft trades as a good basis for the social and political integration of apprentices (Cedefop 2004, p.11).

Now-a-days the situation has changed. The traditional world of life and work in the craft trades are in many countries no longer being considered as a good basis for the social and political integration of apprentices. Vocational education has turned to school-based trainings and especially in developing and emerging countries there is no space for apprentices, because there are rarely patters in place that would allow a dual corporate education. Once students have graduated they search for employment in an environment, where most entrepreneurs are self-employed and won't take the risk to employ co-workers.
However, unchanged is the situation of the demographic pressure that societies and governments in developing and emerging countries face.

Nations' economic success stories are measured in terms of Gross Domestic Product (GDP), innovation and investment indices, employment rates, start-up rates etc. Compiling the innovation index, the start-up friendliness and the investment index the Blomberg Innovation Index[1] ranks Germany 2, Switzerland 4 and Austria12. In regard to the start-up friendliness, Germany is on rank 6, Switzerland on rank 11 and Austria on rank 25. The investment index places Germany on 25th, Austria on 33rd and Switzerland 51st rank. - This does not necessarily explain the economic

[1]Blomberg Innovation Index: https://ceoworld.biz; last retrieved: June 1, 2019

success stories of German speaking countries. Therefore, the economic success of the German speaking countries might come from other sources. This research will dig deeper and will explore the TVET system in the German speaking countries. Due to the economic structure in the German speaking countries the TVET System is prominent and considered by many as the real source of the economic power. However, it has been analysed by many countries, but never it has been replicated with the success it has in the German speaking countries.

This research intends to find the answer, why the replication of TVET success stories from German speaking countries is that difficult in developing/emerging countries. Ethiopia will be used representative for other developing and emerging countries.

METHODOLOGY

A literature review together with statistics about the TVET sector in German speaking countries and the European Union (EU) will be applied as the source to find answers to the question. The Ethiopian TVET situation will be mirrored by the unpublished baseline study for the Education Roadmap of Ethiopia elaborated in 2016.
The author of this research herself is experienced as a teacher in the TVET sector and will provide insights to the success stories of TVET.

LITERATURE REVIEW

This literature review refers to data and information available on European Commission platforms online. To some extend documents and data from Switzerland could not have been accommodated in this research due to the fact that Switzerland - other than Germany and Austria - is not a member of the European Union. With reference to the German literature, it is important to note that each German state has its own education law. In order to simplify the approach this research has its focus on the German states of Bavaria and Baden Wuerttemberg. However, the reference data on European level is valid for all Germany.

The literature review is built around five factors: the purpose of TVET, the structure of TVET, the approach to innovation, entrepreneurship education and TVET teachers.

a) Purpose of TVET
In the German speaking countries the purpose of TVET programmes is understood to train manpower for companies. The focus is on knowledge and competences needed in the professional life (Bayerisches Staatsministerium fuer Unterricht,

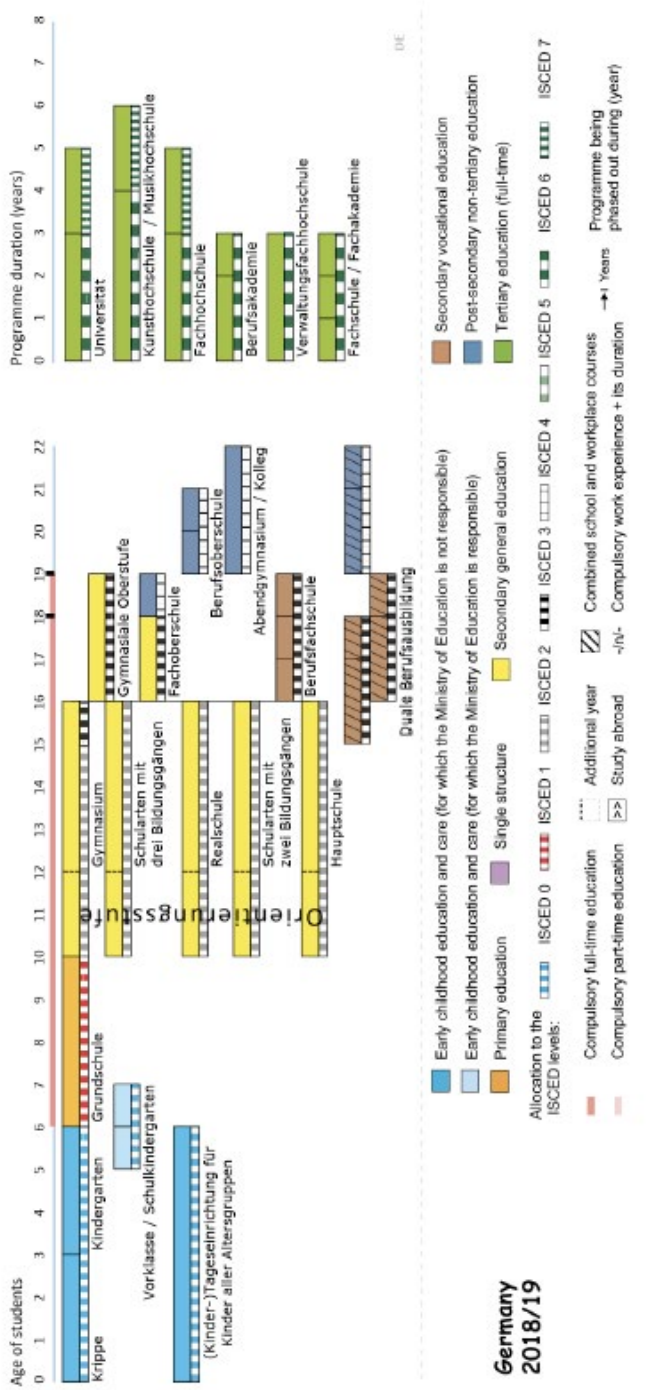
Kultus, Wissenschaft und Kunst Muenchen, 1997; Bundesministerium fuer Bildung, Wissenschaft und Forschung, 2009; Staatssekretariat fuer Bildung, Forschung und Innovation, 2009).

In Ethiopia the "main objective of TVET is to produce a lower and middle-level, competent, motivated, adaptable and innovative workforce. Through the supply of demand-driven, quality TVET, this workforce can transfer demanded technologies and contribute to poverty reduction and social and economic development" (Federal Ministry of Education of the Republic of Ethiopia, 2015).

b) Structure of TVET

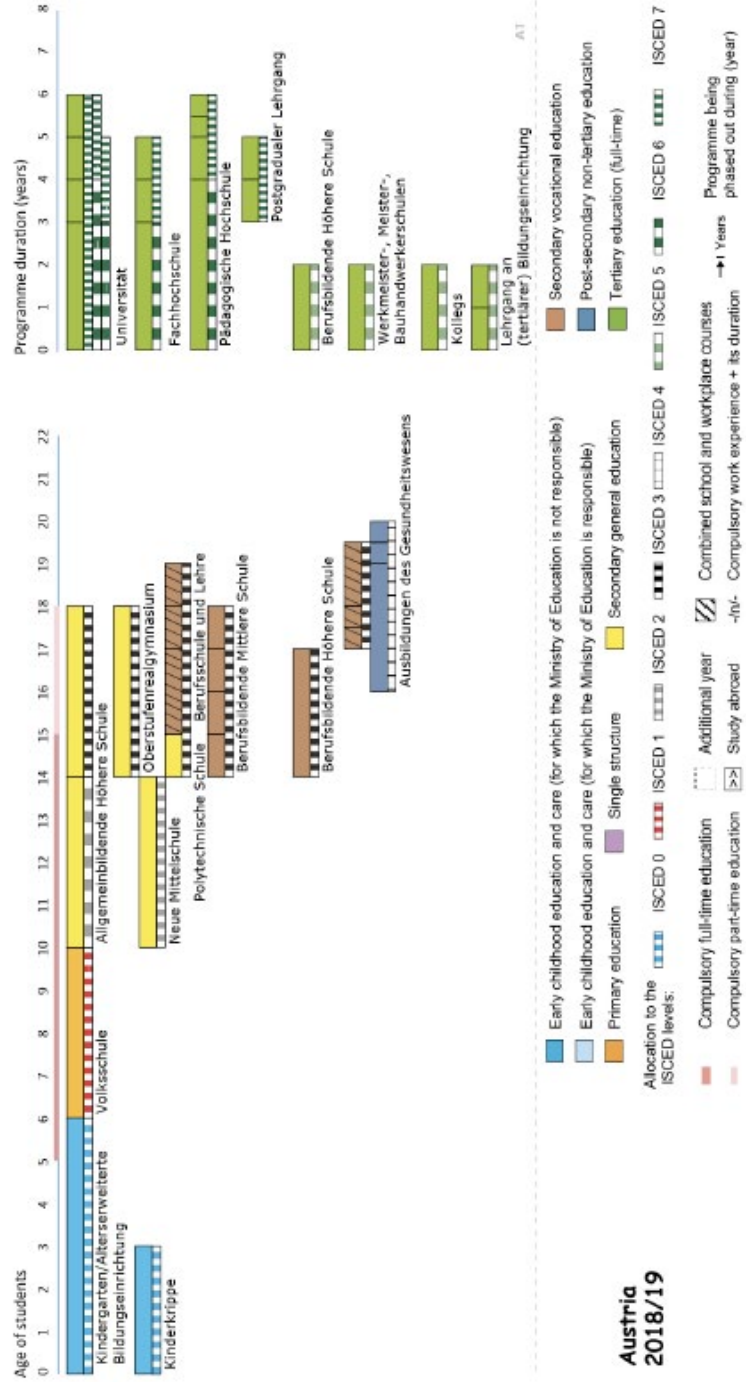
The TVET landscapes in Germany, Austria and Switzerland offer students 4-5 different pillars to pursue their professional education. In each country there is one pillar that also leads directly to higher education. The other pillars offer interfaces, which allow students to continue their education at higher education institutes (European Commission in Eurydice, 2018). Each pillar has components of workplace-based and the school-based trainings (dual-education).In Germany there is primarily the school based learning, whereas in Austria the workplace based learning is more dominant. In company based TVET programme students have a working contract with the company. The content and the quality of training and education are decided by the company and by the school.Whereas in school based TVET programmes students are doing their practical works in companies in form of internships during their summer vacations (Bundesministerium fuer Bildung, Wissenschaft und Kunst, 2002). In terms of the International Standard Classification of Education (ISCED) the TVET sector in the German speaking countries is positioned in the levels 3-4.

Figure 1: Education Structure Germany



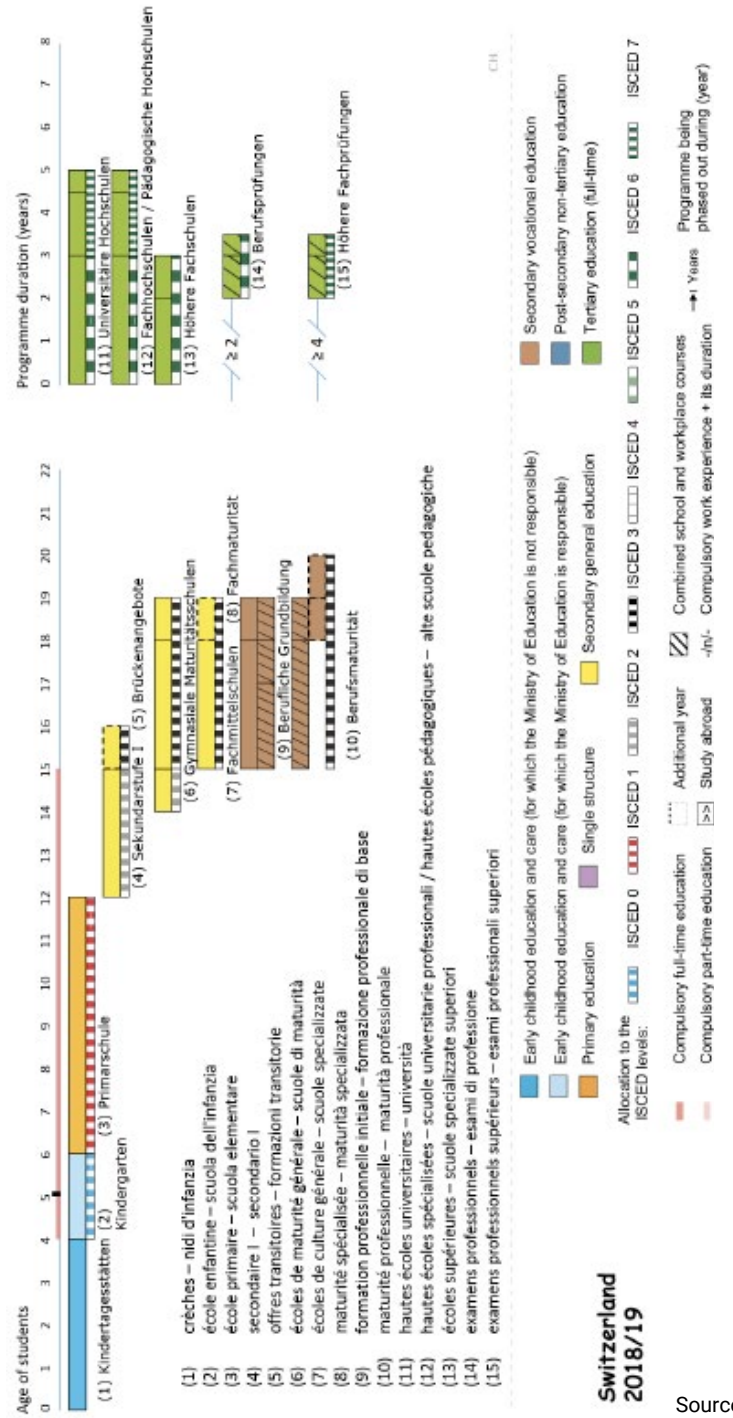
Source: Eurydice 2018/2019

Figure 2: Education Structure Austria



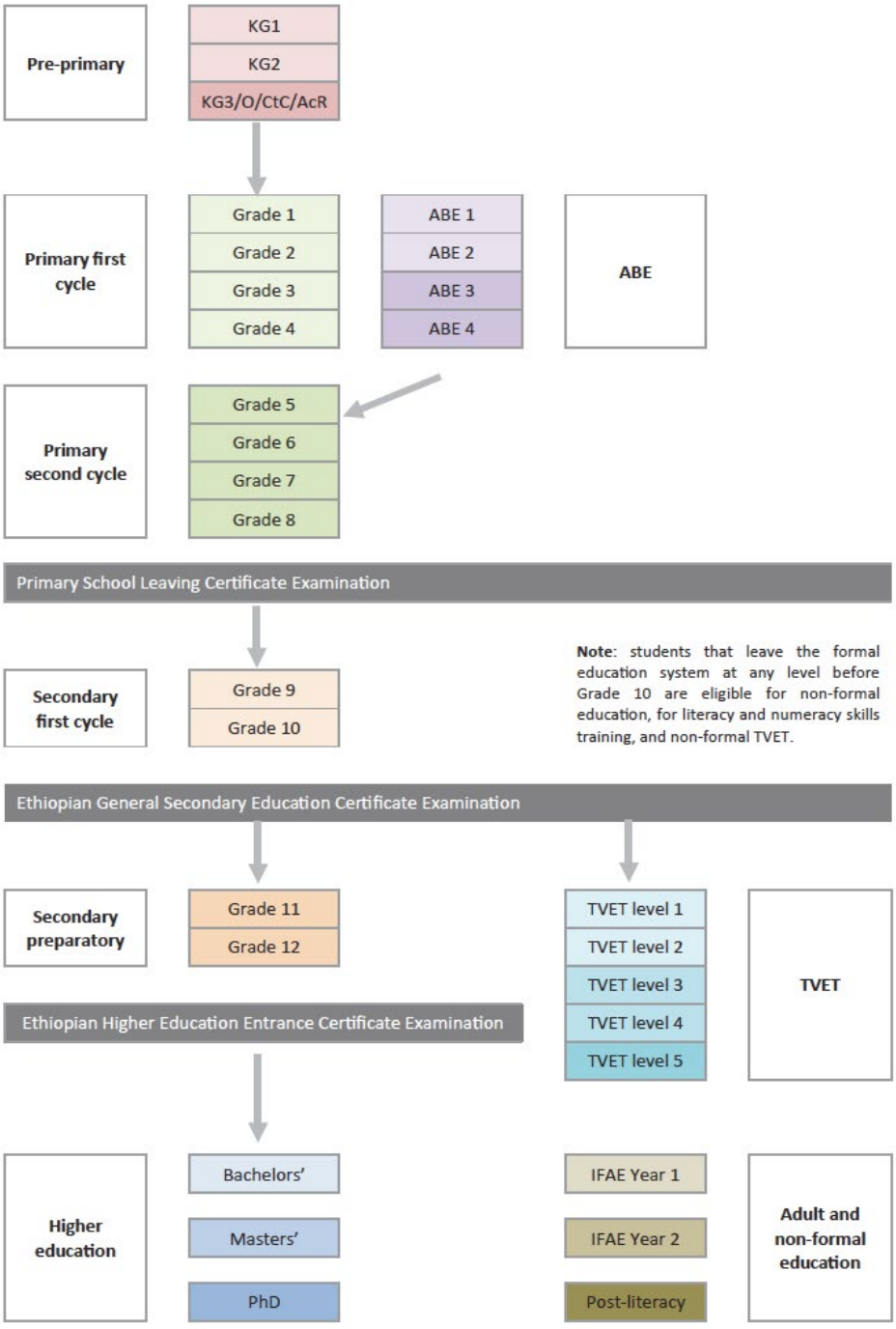
Source: Eurydice 2018/2019

Figure 3: Education Structure Switzerland



Source: Eurydice 2018/2019

Figure 4: Education Structure Ethiopia



Source: Education Sector Development Programme (ESDP) V, 2015

c) Approach to Innovation

The European Commission (2012, p.7) expresses the importance of innovation in the TVET system - overarching the relevance of innovation for all European Union Member States - by stating "an effective [T]VET[2] system can facilitate innovation and economic restructuring … [T]here are at least three reasons why high quality vocational education and training is relevant to supporting innovation:

- technological and process innovations can be absorbed by businesses provided that employees at all levels of the production chain have the required skills;
- given that the majority of European companies (including small enterprises) are involved in global value chains …
- Innovation cannot be limited to high tech industries … Firms in low-tech industries innovate in an incremental way by further developing their products, taking these products to new markets or improving production and delivery processes … [T]hey build on the practical knowledge within the firm which arises 'learning by doing' or 'learning by using and interacting' …"

The European Commission (2019, p.34) suggested policies in partnership for creativity and innovation as follows: skills competition(s), creativity and innovation competitions open to [T]VET learners and institutions, creativity and innovation as an underlying principle in [T]VET, innovation or creativity clusters involving [T]VET providers, innovation strategy including [T]VET, guidelines encouraging partnerships for creativity and innovation in [T]VET, cooperation to develop learning methods in [T]VET fostering creativity and innovation, knowledge exchange platforms for creativity and innovation involving [T]VET, incentives for creativity and innovation partnerships including [T]VET providers.

In Ethiopia there is a clear statement towards technology transfer from TVET to companies (Federal Ministry of Education, 2015).

d) Entrepreneurship Education

The European Commission Thematic Working Group on Entrepreneurship Education has defined "Entrepreneurship education is about learners developing the skills and mind-set to be able to turn creative ideas into entrepreneurial action. This is a key competence for all learners, supporting personal development, active citizenship, social inclusion and employability. It is relevant across the lifelong learning process, in all disciplines of learning and to all forms of education and training (formal, non-

[2][T]VET is equal to TVET. The European Commission is talking about VET (Vocational Education and Training). In order to be consistent with the abbreviation the [T] has been added to the quotes from European Commission.

formal and informal) which contribute to an entrepreneurial spirit or behaviour, with a commercial objective."(European Commission in Eurydice, 2016, p.17)

Entrepreneurship education in Austria is taught as an integrated subject in subjects such as social sciences, economics, business studies and career education or in languages. Mostly it is understood as a cross-curricular approach. (European Commission in Eurydice, 2016, p.71).

Scrutinizing curricula of school-based TVET programmes in the German speaking countries it refers to an entrepreneurial attitude in the frame of innovation rather than to entrepreneurship as a stand-alone subject as seen in the following example - translated by the author - from the curriculum for school-based TVET programmes issued by the Ministry of Culture, Youth and Sports, Baden Wuerttemberg (2015): 'graduates have to be able to recognise, structure, analyse and evaluate problems in the field of their profession and find solutions to solve problems discovered. In changing and new situations creative ideas and solutions need to be developed. An important learning outcome is the enablement of economic thinking and responsible acting. In management positions graduates need to guide, motivate and evaluate staff. The competences to criticise and to solve conflicts are as important as to build and work in a team…. If graduates want to work in the management … [they] need communication skills and should be able to take decisions. The internationalisation of companies requires communication competences in foreign languages, especially English language skills in the respective field of the company.'

In the implementation of the curriculum the practical entrepreneurial experiences are seen in doing project-based work, being given a practical challenge, taking part in a community challenge, creating a mini/junior company or in micro-financing student initiatives (European Commission in Eurydice, 2016, p.75)
The European Commission (Eurydice, 2016, p.80) sees the learning outcomes from entrepreneurship education in

- Entrepreneurial attitudes (self-confidence and a sense of initiative)
- Entrepreneurial skills (creativity, planning, financial literacy, managing resources, managing uncertainty/risk, teamwork)
- Entrepreneurial knowledge (how to assess opportunities, the role of entrepreneurs in society and entrepreneurial career options)

In Austria the 'TRIO Model for Entrepreneurship Education' has been applied with the objective to create a sustainable and dynamic civil society of citizens (European Commission in Eurydice, 2016, p. 89). The TRIO Model is built on 3 levels:

- Level 1 is concerned with establishing a basic understanding of entrepreneurial learning and familiarisation with developing ideas and putting them into practice
- Level 2 deepens the core education through more advanced activities seeking to consolidate/encourage an entrepreneurial culture
- Level 3 is about encouraging a culture that promotes maturity, autonomy, personal responsibility and solidarity (value basis).

Austria has developed a reference framework for entrepreneurial skills in order to capture the key competences (European Commission in Eurydice, 2016, 90).

The Ethiopian baseline study conducted for the Education Roadmap of Ethiopian (2016) indicates that in the field of entrepreneurship education TVET offers specific entrepreneurial skills trainings that enable the trainees to establish their own enterprise, to generate and manage their income and gain management skills.

e) Teachers

"The role of teachers and trainers is crucial in the modernisation of [T]VET with a special focus on how they are recruited, their professional development and status in society. … [A] trainer in a work-based setting will need more pedagogical competences and must play a supportive and mentoring role; while a teacher in a school will need, like a trainer, a good understanding of work practices." (European Commission, 2010, p.7). In the German speaking countries there are different approaches to become a teacher or a technical instructor at TVET. In Bavaria - for example - there is a 2 level approach: study programme in the respective discipline and preparation service for 2 years followed by a national exam. (Bayerisches Staatsministerium fuer Unterricht, Kultus, Wissenschaft und Kunst Muenchen, 1997). In Austria the technical instructors have to have a programme specific vocational education, 6 years of professional work in industry and 6 semester pedagogical study programme. A technical teacher has to have a Master's degree in the programme's specific subject and at least 4 years professional work experience in industry. The pedagogical qualification is an in-service training at a pedagogical university in the first year of teaching. (Bundesministerium fuer Bildung, Wissenschaft und Forschung, 2009). In Switzerland the TVET teacher/instructor qualification is similar to the one in Austria.

In Ethiopia, teachers have bachelor's (B-Level) or Master's (A-Level) degrees. Instructors are diploma holders. Work experience in industry is not a requirement. In industries are trainers trained specifically for the company-based training, which is - in generally - organised as an internship. (ESC, 2016)

ANALYSIS

The gaps analysis is based on the specific findings in the literature review.

Table 1: Factors in Comparison between German speaking Countries and Ethiopia

Factor	German speaking countries	Ethiopia
Purpose	Training of workforce for industry[1)]	Education to reduce poverty[2)]
Structure of TVET	Different school- and company based programmes for different levels of qualification[3)]	School-based programmes in 5 levels of qualifications[4)]
Innovation	Follows the EC suggested policies in partnership for creativity and innovation.[5)]	Copying technology to transfer to industry[6)]
Entrepreneurship education	Cross-cutting training throughout the TVET programme. The framework curriculum provides the teacher with the outcomes that should be achieved after completing the education and training programme.[7)]	Courses on entrepreneurial skills[8)]
Teachers	Teachers are master graduates with work experience and pedagogical qualification (AT) Technical instructors with professional qualification, 6 years specific work experience in the industry and 6 semester pedagogical studies.[9)]	Teachers are bachelor or master graduates no practical work experience is required. Trainers in industry get specific pedagogical training.[10)]

Source: Information collected and summarised by the author

1) Bayerisches Staatsministerium fuer Unterricht, Kultus, Wissenschaft und Kunst Muenchen, 1997; Bundesministerium fuer Bildung, Wissenschaft und Forschung, 2009; Staatssekretariat fuer Bildung, Forschung und Innovation, 2009
2) Federal Ministry of Education of the Republic of Ethiopia, 2015
3) Eurydice 2018/2019
4) Education Sector Development Programme (ESDP) V, 2015
5) European Commission, 2019
6) Federal Ministry of Education of the Republic of Ethiopia, 2015
7) European Commission in Eurydice, 2016
8) Education Roadmap of Ethiopian, 2016
9) Bundesministerium fuer Bildung, Wissenschaft und Forschung, 2009
10) ESC, 2016

The framework curricula in the German speaking countries mirror the profiles of the experts TVET institutions should educate/create. These profiles are set by the industries and refer to experts and personalities, the industries need. Since most of the industries in the German speaking countries are categorised as Small-and-Medium-Sized Enterprises (SMEs), an employee has to respond to a wider professional profile than in big companies. In general, employees in SMEs are considered to work independently with an entrepreneurial spirit at all levels. It is expected that a team leader, a head of department lead their teams in the same way as the Chief Executive Officer (CEO) – meaning - with an entrepreneurial spirit in view of sustainability and to the best for the company. Given to the frame work curriculum, TVET alumni in the German speaking countries understand the importance of entrepreneurial thinking in their daily work as their responsibility to contribute to the success of the company and to guarantee jobs for themselves as well as for the other employees in the long-term. Especially, the SMEs are aware that they are positioned in the market due to the competences, attitudes and knowledge of their workforce. In general, employers and employees know their responsibilities - also those responsibilities, which are born in culture and tradition and not necessarily stated in employment contracts. The appreciation between employer and employees is vice-versa (in most SMEs fluctuation of employees is very low). - This culture of entrepreneurial thinking, attitude and behaviour is reflected in the guidelines to the framework curriculum of the respective TVET programmes.

The framework curriculum guides the teachers to educate and coach the students to discover problems in their professional field, to structure, analyse and evaluate the problem discovered and to create a solution for the problem discovered. This problem solving approach is applied through-out the education as well as training process and directs teachers through the rough guidelines set in framework curricula on how to coach students through problem based/solving learning situations. Reference is given to Bloom's Taxonomy (Bloom et al, 1956) which captures in its genuine approach the cognitive domain in structure of knowledge, comprehension, application, analysis, synthesis and evaluation. The framework curriculum allows teachers to design syllabi in the way that the higher levels of the cognitive domain are well covered and students get challenged with problem-based/solving learning approaches. The European Commission understands problem-based/solving learning and teaching as the key to introduce TVET students to - the continuous search - how to improve products, processes, input factors or to find new markets what is in brief called innovation (European Commission, 2012, p.52).

At the same time the entrepreneurial attitude, skills and knowledge are incorporated

in the problem based/solving teaching and learning approaches. The means (input factors: capital, human resources and raw material) are at all time limited and need to be managed well. Schumpeter (1942) describes an entrepreneur as an agent of the input factors. Therefore, everyone, who is managing limited resources, could be considered as a person with an entrepreneurial attitude and skills.

Innovation as a subject per se could not be found in the curricula scrutinized, but the framework curricula refer to the continuous improvement of processes, outputs etc. what reflects the definition of innovation given by Schumpeter (1942).

In the German speaking countries TVET teachers and instructors are well trained and are skilled experts in the professions they teach. Through their experience in professional life, they know the industry and its specifics, demands as well as needs. TVET students are taught and instructed by professionals in all theoretical and practical subjects of the respective specialised programmes.

CONCLUSION

This is not the place to come up with recommendations. However, the literature review and the analysis show the (possible) success factors of the TVET system in the German speaking countries for further scrutiny.

1. The purpose of TVET programmes is to serve the local companies with highly qualified workforce at all levels. In the centre of the discussion are not the transfer of technology and the economic development, but the knowledge, skills, attitude and the entrepreneurial mind set of the workforce requested by local companies of all sizes.

2. The structure of TVET is an argument that is widely used as the success factor. In all the German speaking countries TVET education is offered at different levels: the apprenticeship in a company, the school-based training at TVET institutions and the school-based training at vocational college that ends with the professional qualification and offers at the same time the access to higher education. The TVET training starts as early as in grade 9 (age 15). General education is offered in parallel to the professional training at the respective level. Framework curricula set the pillars for the training and education at the same time it structures the objectives teachers' and instructors' interventions should achieve.

3. The innovation approach goes without saying, because the framework curricula describe the profiles of the workforce that the TVET programme should create. With reference to Bloom's Taxonomy students should be trained at all cognitive levels. They should be able to discover structure, analyse and evaluate problems in their professional fields and find solutions for the discovered problems. Through this approach students become independent learners, equipped with entrepreneurial spirit, attitude and skills. This kind of problem-based/solving learning is not only applied in TVET programmes, but also in the general education programmes and goes throughout all levels of education.

4. The entrepreneurship education in the German speaking countries is mainly considered as a cross-cutting issue covering a variety of subjects. Additionally, there are the possibilities for students to create a junior company as offered in many TVET colleges in Austria. The junior company is a real company set up by a team of students with a real product for the real market. The company is run for one school year and will be liquidated by the end of the year. Students have to raise the equity capital of a few hundred Euros by selling shares (mainly to family members, teachers or local organisations). If they are successful and have aggregated some profit, they will pay dividends to the shareholders; if they are not successful then the shareholders have to bear the risk. By the end of the junior company, students can participate in the Entrepreneur Skills Pass (ESP) test in order to gain proof of their experience as entrepreneurs or managers in a junior company. Practice firms – another practical entrepreneurship education approach in TVET programmes - are foreseen in the curricula primarily in commercial colleges. There, the product is virtual, but students work in a business like structure. Students interact nationally and internationally within the global network of practice firms.

5. The teachers and instructors in the TVET programmes in the German speaking countries are the key factors for success. They are experienced in professional life; they know their profession and understand the difficulties as well as the challenges, the respective companies face. TVET teachers and instructors in German speaking countries understand themselves as coaches and mentors for the next generation workforce. They have completed the respective study programmes with the necessary exams in the TVET system or at higher education, they have worked for a number of years as qualified experts in their profession and they followed the required pedagogical training in order to become teachers or instructors at company-based or school-based TVET programme.

In conclusion, in the understanding of the author of this research the success story of the TVET system in the German speaking countries can be summarised to five factors: the purpose of TVET, the structure of TVET, the holistic approach to innovation, the integrated entrepreneurship education and the qualification criteria of teachers/instructors. Maybe a closer look to these five factors could offer ideas to boost the attractiveness of TVET programmes in developing and emerging countries and subsequently could create success stories to tell.

As a lesson drawn from the German speaking countries' TVET system Ethiopia should consider to change the current curricula applied for the TVET education programmes towards framework curricula. The German speaking countries have implemented framework curricula with the respective guidelines on the learning objectives, which should be achieved in the specific education level. The challenge lays in the ability and skills of teachers to interpret these guidelines and to build individual syllabi, which will bring dynamics and flexibility the teaching and learning approaches and allows teachers to react on new situations, to incorporate those in lectures and to use/develop/create/design the most appropriate lecture material by themselves. In order to use the advantages of the framework curriculum teachers have to be pedagogically well trained that they are able to elaborate their individual syllabi. In emerging and developing countries such as Ethiopia, there is a shortage of qualified TVET teachers. Those teachers, who are not sufficiently qualified need guidance and support in their work with the framework curriculum. It would be an investment in to the 'not yet qualified teachers' and the quality of the TVET system as a whole, if peer group trainings and mentoring for unexperienced teachers could be offered in order to upscale their skills in applying appropriate teaching methodologies and to get ready for a flexible and dynamic teaching approach as it is required/offered by framework curricula.

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Building Linkages and Partnerships Between Public Sector Research Organizations and Private Sector: The Nigerian Experience

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ABSTRACT

There is the undeniable link between the ivory tower and the labour market. The universities supply the manpower needed to run the public and private sectors. Universities develop mutually beneficial relationships with organizations around the world; from the smallest owner-managed SMEs to the largest multinational conglomerates, government agencies, other universities and non-governmental organisations. Such unrivalled links with businesses, governments and industries ensure that the universities deliver world-class education with a practical and business-focused edge. The universities as research institutions can assemble teams of experts from across skill sets, often in collaboration with other universities and consultants, to meet challenges faced by businesses and industries. Universities also bring on board staff who have spent considerable time in industry and government. This study is an exploratory enquiry into the Nigerian situation. It seeks to find out if such symbiotic relationship between the 'town' and the 'gown' exists. If so, how prevalent are there? Collecting accurate data was a challenge so the study lends itself to more valid quantitative enquiry to document the full picture. It goes ahead to make recommendations on the way forward so that research institutions in Nigeria can rise to meet the challenges of the 21st century.

INTRODUCTION/BACKGROUND

The universities train the workforce for the public and private sectors. Therefore, there ought to be a symbiotic relationship, a synergy, between the university and the labour market. No nation can achieve its full potential if there is a disconnect between the academia and the private sector. Research institutions like universities are the centres for experimentation and knowledge production for development. The universities produce the manpower for the labour market, but there has been rising complaints that the graduates are unemployable because they don't have requisite skills needed by industry. The emphasis has been on theoretical knowledge. The universities believe that they can only achieve so much based on the large numbers of students they are catering for and the grossly insufficient funding that they receive. In many countries in Sub Saharan Africa, despite the crucial role higher education plays in raising a knowledgeable workforce, the sector is bedeviled by poor and grossly insufficient infrastructure, increasing ineffectiveness, poor funding, obsolete research provisions and outdated content. All these have dire consequences on the quality of the products.

Insufficient funding is identified as the major cause of the grim situation of Nigerian universities as captured by Iyabo Lawal (2018):

> Though Nigeria has at least 40 federal government-owned and 38 state government-owned universities, it has not been able to meet the United Nations Educational, Scientific and Cultural Organisation (UNESCO) standard of 26 per cent budgetary allocation for the funding of education.The highest allocation so far recorded was 8% in 2006 and 2013. Yet, 60 per cent of that funding for universities goes into recurrent expenditure. The reality remains that funding has not been adequate for Nigeria's tertiary institutions. That is even more frightening when the number of admission seekers is considered. At least 1.5 million candidates have consistently been applying for admission in the last seven years and due to inadequate funding and facilities, only 250,000 of these candidates are admitted, raising the issue - again - of funding and access.

The universities are not able to provide this teeming population with basic infrastructure like classrooms or hostels. There is little or no money voted for research. There is a huge concern about balancing quality with access. According to the World Bank (as cited in Iyabo Lawal's paper), higher institutions in sub-Saharan African countries like Nigeria face the formidable policy challenge of balancing the need to raise educational quality with increasing social demand for access. In its report it

adds: "The task of funding these institutions will become increasingly difficult in the years ahead, as the youth population continues to grow, each country will have to devise a financing approach to higher education development that enables it to meet the challenge."

That "financing approach" stakeholders in the education sector have come to agree to is the collaboration between the gown (higher education) and the town (private partners). In addition to providing the much-needed finance, this collaboration will also ensure that the workforce trained by the universities meets the demands of the private organizations which absorb these products.

Public-Private Partnership (PPP) is said to be a cooperative venture between the public and private sectors (Grimsey & Lewis 2004) formed from the combination of the resource capacity and expertise of each sector, in order to provide a stronger base for delivering public services in a better, more efficient and effective manner. It is one of the many other innovative procurement strategies introduced to complement or replace the traditional open competitive tendering route as the case maybe (Ahadzi & Bowles 2001). PPP allows asset financing especially when a government is not able to finance the needed facilities.

In other words, it offers alternative source of financing for improved public service delivery and or new infrastructure development. (Li et al 2005). It is an arrangement in which the private sector carries out the role of the supplier of infrastructure of assets and services that have traditionally been provided by the government. This agreement involves pooled public and private resources; shared responsibilities; complementary efforts; equity sharing (if there is government organ investment); formation of special purpose vehicle to develop, build, maintain and operate for the contracted period.

These are contracts between public institutions like universities and businesses which can accomplish what neither side can do alone. These partnerships can be used for innovation and capacity building. Ideally, it brings private sector competencies, efficiencies, and capital to improving public assets or services when such institutions lack the funds and the expertise to provide them. Companies agree to take on risk and management responsibility in exchange for recognition or profits linked to performance. They have the potential to build in synergies, develop competencies, and create an effective framework for alliances and cooperation.

Discussing the possible linkages between the university and the industry in the area of research, Ayobami Salami (year) writes

> Universities, by their very nature, are a sacred temple of experimentation and knowledge production for development. On the other hand, the organized private sector and by extension, the public sector, exist to put to work, ideas founded on sound theoretical frameworks. Universities serve as inspiration and solution centers for growth and development. Therefore, having entrenched synergy between both the town and the gown is to run a society that benefits from the dynamic cyclical flow of explanations and well-thought-out perspectives to presenting development challenges.

Financing research is one challenging area. The corporations in Nigeria and most West African countries rely on their parent companies abroad or higher institutions abroad for research into new products or improvement on existing ones because of the weak linkage between the industry and academia. A glaring example is in the oil sector. Oil well drilling, well completion and production enhancement require the use of several chemicals known as oilfield chemicals. Most of the chemicals currently being used in Nigeria and other African countries where oil has been discovered and produced are imported. However, the raw materials for these chemicals are available locally in large quantities and could be sourced and processed for use in oilfield operations. The lack of research in this area has robbed these nations of enormous opportunities to create jobs, generate new knowledge and develop skills because all the research is carried out abroad. The oil and gas sector, like NLNG, offers young and brilliant scholars' opportunities for training overseas because studying in those countries will better equip them to meet the needs of industries rather than the local higher institutions. This should not be the case. Due to lack of funds, research is done in Nigeria merely as an academic exercise. The publications are measured in terms of quantity and not quality. The over-riding aim is to secure enough publications for promotion purposes only. There is little link between the research done and the industry that the research is meant to serve. In Nigeria, the National Universities Commission had to publicize a long list of journals whose low-quality research content cannot withstand international scrutiny.

Review of relevant literature (see the work done by Anand below as well as the example from India as captured in HeadFoundation.org) shows that the private sector can link with research institutions to achieve the following:

a) skill development (education and training like the Continuing Professional Development Course offered by the British Council to University teachers to update their knowledge on pedagogy and computer-assisted learning)
b) the generation, acquisition and adoption of knowledge (innovation and technology transfer like the Video in the classroom project rolled out as a

collaborative effort with Shell Petroleum Development Company, Discovery Learning Alliance and Ministry of Education)

c) the promotion and encouragement of entrepreneurship, i.e. start-ups, spin-offs and incubation centres.
d) Co-ordinating research and development (R&D) agendas to avoid research duplications
e) Stimulating additional private sector investment
f) exploiting synergies and complementing science and technological capabilities.
g) expanding the relevance of research as is conducted in public institutions
h) promoting commercialization of research and increasing the mobility of labour between the public and private sectors. This is evident in some developing countries like Chile and Colombia where collaboration with the university substantially increased the propensity of firms to introduce new products and patent their inventions.

Collaborations between the academia and industry have different objectives and scopes. The emphasis could be on research and training. Other areas of collaboration include infrastructure, contracts, patent licensing, publications, and interactions in conferences and expert groups among others.

Relevant questions

The study sought to answer the following questions:

1. What are the existing linkages the present researcher has managed?
2. Are these linkages sufficient for this ever-growing sector?
3. What are the strategies for improving public private partnership in higher education?

Significance:

The supply – demand gap in education is consequent on the inability of the government to meet demands. Provision of education is perceived as the responsibility of the government, but lack of financial and managerial capability often impedes government's ability regarding promising and qualitative higher education (Anand, 2012). At the world declaration on higher education for the 21st century, UNESCO gave a mandate on partnership and alliances which specify that higher education institutions should engage in public and private partnership in the process of **research and infrastructural development** (UNESCO, 1998). In line with this declaration, research has shown that developed countries have embraced PPP in managing education. However, this does not seem to be the case

with Nigeria as little success has been achieved. This is evident in the deplorable state of infrastructures, facilities and equipment as well as inadequate funding for research which is the bane of higher institutions in Nigeria (Salami, 2003).

Higher education in Nigeria is lacking in quality, access and funding expected of stakeholders and PPP has not achieved anticipated effectiveness. There is no doubt that government alone cannot handle the investment required in higher education sector. Therefore, there is need for deliberate effort by the government and private sector to address the challenges because everybody is a stakeholder in the education enterprise. It is this reality that provides a justification for private initiative and participation in higher education. This paper proposes to highlight the existing linkages between research institutions and the private sector in Nigeria. It will examine the adequacy or otherwise of these linkages and it will map out strategies for improving public private partnership in higher education.

Methodology

The methodology adopted for this study was both quantitative and qualitative data gathering. The writer tried to generate numerical data which could be transformed into usable statistics. Such data is often used to quantify opinions, attitudes and behavior and generalize results from a large sample population. Measurable data is used to formulate facts and uncover patterns.

But in Nigeria, the task of accurate information gathering makes collecting quantitative data a herculean task. Higher institutions consulted are often not the best in keeping records and supplying such on demand. The writer will have no recourse than using qualitative data which is primarily used for exploratory research. This research is to provide insights into this topic as well as formulate hypotheses for future quantitative research. Since this research will be examining several examples in Nigeria, qualitative rather than quantitativedata will be used. This paper relies heavily on anecdotal references as well as relevant literature.

Results and Discussion

1. What are the existing linkages between research institutions and the private sector that the present writer has managed?

Teacher Development by Radio was a collaboration of BBC, British Council, National Teachers' Institute, Federal Radio Corporation and the various state Ministries of Education. The overall aim of the project was for teachers throughout the country to receive professional support through distance learning. Specifically, the programme

worked with teams in various parts of the country to produce home-grown educational materials.The first two series of programmes focused on important and topical inputs on the latest developments in primary education.The programmes put primary teachers in touch with what is happening in different parts of Africa and the world and invited them to take a fresh look at their own teaching.The programmes encouraged teachers to become active participants in the development process by joining in teachers' panels as well as phoning in their views and questions to the studio guest.

The radio stations and the sponsors benefited by offering highly educationally desirable and motivating programmes for the primary teachers and for the general educated public interested in primary education. The full support of the Ministry of Education helped to promote the trainings to reach the widest audience. The donors' reputation was established as the sponsor and an important supporter of educational development in Nigeria.There were also opportunities for the programmes to be broadcast in neighbouring countries and throughout Africa through a regional research project.

The pattern Teacher Development Programme by radio followed an identifiable pattern:

1 Introduction, leading to a Nigerian section of 15 minutes, based on the theme and ideas of the BBC programme, containing comments from the general public, teachers, trainers and administrators, classroom descriptions and extracts, children talking and panels of interested parties
2 The BBC programme, lasting about 15 minutes, exploring the topic with examples and comments from South Africa, India, Bangladesh, Zambia, Brazil, etc.
3 A phone-in and studio guest, where the topic is discussed live with comments and questions from listeners.

Impact: The feedback we received was that number of listeners was more than six million. The programme ran successfully every week for the six month's duration of the MOU.

Continuing Professional Development Course

This course was jointly designed by British Council, National Teachers Institute, expatriate external consultants and Nigerian University professors. The beneficiaries were university teachers from all the thirty-six states of Nigeria. The model was a

train-the-trainer approach in which each of the trained lecturers will train ten other lecturers. The course content was transmitted via CD-ROM. It was computer-assisted learning.

Impact: the overarching significance was compelling the trainees to embrace computer-assisted learning. Most of the participants came with zero knowledge of operating the computer.

It also exposed them to modern pedagogical tools and child-centred practices.

Video in the Classroom project.
This is an on-going partnership among Discovery Learning Alliance (a not-for-profit arm of Discovery Communications International of America), The Coca Cola Africa Foundation, Chevron, and Shell Petroleum Development Company, DFID, the academia and the state ministries of education. (See Appendix below for Fitila Project in Kano)

Video in the Classroom project uses the power of media to transform education and improve lives in marginalized communities around the world. This in-school intervention and mass media initiative has succeeded in getting more children in school and learning in 16 countries.

The school-based interventions increase teacher effectiveness and student enrollment, attendance, learning, and, critically, student motivation. It also engages parents and communities, increasing their commitment to education and involvement in their children's schools.

Educational content is developed through a collaborative process that combines the contributions of expertise and high-quality media from Discovery Communications with the needs of educators in countries where the project is active. Extensive teacher training and capacity building ensure that the value of educational media is maximized as a tool for teaching and learning. The project reaches into local communities through community workshops that lead to the development of community action plans targeting communities' priority issues. Schools then become centers for learning and catalysts for addressing important community issues including HIV/AIDS, girls' education, malnutrition and the environment.

Apart from the collaborations above that this writer has initiated, managed and evaluated, the following partnerships were also discovered:

i) The Nnamdi Azikiwe University (NAU), Awka and Fountain University, Osogbo illustrate the success stories of public-private partnership.
For example, NAU has projects like the ChikeOkoli Centre for Entrepreneurial Studies (a Design-Donor-Fund-Build and Transfer project); JUHEL Building housing the Faculty of Pharmaceutical Sciences; ELMADA International Hostels (a Built-Operate and Transfer project); Chisco Institute of Transportation Studies; and Gauze Pharmaceuticals Ltd Pharmacy.

ii) At Fountain University, there are the IBB Students' Centre; Hall EasyPlace Properties Accommodation Project (under Build-Operate and Transfer); College of Natural and Applied Sciences in partnership with Al-Jaiz Bank, Nigeria (a Design-Finance/Fund project); Hajia Amina Namadi Sambo Multipurpose Hall (a Design-Build-Transfer project); and Adegunwa Hall of Residence is another Design-Build-Transfer venture.

iii) 400 bed space capacity student hostels for the University of Lagos provided under a PPP

iv) University village at the Obafemi Awolowo University Ile Ife, where about 16 developers have partnered with the institution to provide student accommodation ranging from 100 to 400 bed spaces using BOT Model

v). The introduction of NOTAP-Industry Technology Transfer Fellowship by National Office for Technology Acquisition and Promotion led multinationals into partnering the academia to solve their problems. The project was launched on July 28, 2015 with the first batch of five beneficiaries already carrying out intensive research on their various fields of study. The NOTAP –Industry Technology Transfer Fellowship (NITTF) has undoubtedly facilitated functional linkages between the academia and industry. In order to continue to strengthen the knowledge institution and also solidify the synergy being triggered by this fellowship, the shortlisted candidates for the 2017 academic year were recently assessed by a committee of industry experts and the academia. In this case, candidates were assessed using various criteria based on the industrial needs of the companies that would sponsor them.

vi). Operating under the aegis of Centre for Oil and Gas Technology, Institute of Petroleum Studies of the University of Port Harcourt is sponsored by TOTAL E&P Nigeria Limited and NNPC Joint Venture. The Strategic Plan designed at the inception of the Institute has created room for expansion paving the way for the establishment of eight new Centres.

vii). The African Centre of Excellence in Oilfield Chemicals, Institute of Petroleum Studies (IPS), University of Port-Harcourt is established to offer international graduate programmes for sustainable development in the petroleum industry. The Centre recently won a multi-million dollars grant from World Bank to establish an African Centre of Excellence in Oil Field Chemicals Research to address regional development challenges in the oil and gas industry. The Centre is well positioned to deliver professional and high quality service to the industry through capacity building and cutting edge research.

viii). The John D and Catherine T MacArthur Foundation has developed partnership with some Nigerian universities in its global programme for sustainable development. In 2001,the Foundation provided a planning grant of US $ 100,000 and an institutional strengthening grant of US $3,000,000 to University of Ibadan in2001 and 2002 respectively. The focus of the partnership includes ICT (provision and training) and university – industry collaboration for research, entrepreneurship and innovation. This later crystallized into the Ibadan Business School.

ix). Zinox Technologies, an indigenous computer company has collaborated with universities in developing Information Communication Technology (ICT)facilities and training of high-level manpower on ICT components.

x) The communication industry such as MTN, GLOBACOM, the banks, and other financial institutions are also involved in private initiatives and collaborations. For instance, in University of Lagos, MTN has lent support in the area of e-library; banks have also intervened in the areas of funding scientific research. The private sector has formed partnership with higher institutions in theadvancement of research which includes donation of teaching and researchinfrastructure such as lecture halls, laboratories, hostel accommodation, ICTcentres, provision of scholarships, supply of textbooks and journals, and the development of work – related curriculum (Ogbodo & Nwaoku, 2007; Oghenekohwo & Abu, 2011)

2. Are these linkages sufficient for this ever-growing sector?

The answer is negative. The challenges are daunting and ever increasing. Infrastructure alone is a major challenge. Despite these contributions from the private sector the demand is huge and the gap between demand and supply is still very wide. This prompted the Federal government of Nigeria to evolve several reforms for effecting positive change in Public Private Partnership (PPP). Some of these reforms include Public Private Partnership Initiative (PPPI), Adopt – a – School, Community

Accountability and Transparency Initiative (CATI), PrivateDevelopment Initiative (PDI)) and Higher Education Collaboration (HEC). These aregeared towards providing an enabling environment and stimulating activeparticipation of the private sector in higher education development. Despite these reforms Public Private Partnership (PPP) remain limited in Nigeria.

3. What are the strategies for improving public private partnership in higher education?

The strategies focus on removing the constraints to effective partnerships. Such challenges have been identified

a). Corruption is one of the challenges PPP projects are currently facing in the country so if corruption is reduced to the minimum, PPP will thrive. The effect of corruption on say the three stages of a construction project; namely, decision, tender, and execution stages can greatly affect the success of a PPP project. At the design stage a corrupt officer could decide to execute a project based on his or her interest (Hodge et al., 2010) and most times the cost of public services are unnecessarily increased as a result of corruption (Vries & Yehoue, 2013).

b). Visibility: Investment in education has a long maturation period. It is difficult to quantify the impact of a project on say primary school pupils. Many organizations would want to invest in activities that will project them as responsible corporate citizens. This hit-and-run approach may not be healthy is the long run. All stakeholders need education and patience as the fruit of the investment matures.

c). Monitoring and evaluation can constitute a challenge. With infrastructure, the milestones are easily measurable, but quality services are not so easily evaluated. Sometimes the partners depend heavily on anecdotal evidence which will need scrutiny to validate.

d). Societal challenges of vandalism and low maintenance culture. This is a menace and a huge challenge for infrastructural challenges. Security-challenged zones do not and cannot profit from PPP because of this.

e). Governance is also an area of challenge. Governance refers to all processes of governing either formal or informal. Suitable governance mechanism should be designed in such a way that the interest of the public will be properly protected (Hodge et al. 2010). Proper monitoring process and a robust institutional/legal framework are often not in place.

f). Lack of transparency on the part of the public institution is one of the reasons why the private is not keen in partnering with them. The process of awarding contracts and going into partnerships should be transparent.

g). The fact that the institutions do not have total autonomy to be able to partner with the identified private organisations is a problem in the partnership arrangement. There is therefore the need for the individual institutions to have a degree of autonomy in order to be able to reach out to potential partners. There is the need for university autonomy, in order for them to work; a level of autonomy is needed. Universities should be free to reach out to partners/ Stakeholders.

CONCLUSION

There are obvious drawbacks in private funding of infrastructure and research in the universities. Apart from the funding challenge, there are also ethical considerations especially in research. As private companies finance research, they can remotely influence the outcome. The setback is that some of the partnerships are not founded on genuine need but on what the partners consider important. This assumes a patronizing attitude to the recipients

Schools are looking for private organizations to fund their research and infrastructure whereas private organizations are looking for reputable institutions to invest in.
The determinants of the effectiveness of the universities to attract private sector investment and involvement are the past productivity of the school, the scientific collaborations and networks of the university and the pedigree of the researchers.
There is no one-fit situation for every institution, but each can work with available stakeholders to move the universities forward.

This writer recommends that universities actively seek out funding partners in the public and private sectors. There is a lot of information on partnership opportunities. It is the duty of the research institutions to identify these opportunities, understand their requirements and follow their guidelines for applications. Efforts should be made to document and share information on such partnerships. It will assist in building up the reputation of the school and attract more partners.

One of the challenges faced in this short study was information gathering. There is the need for further research to document, as much as possible, all the existing partnerships in research institutions in Nigeria. It will be interesting to understand the processes of creating those partnerships, the challenges and the success stories. It will be heartwarming to document the best practices in this field for replication.

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The Fitila Project

The **Fitila** Project, in partnership with Nigeria's Kano State Universal Basic Education Board (SUBEB) and the Discovery Learning Alliance (DLA), works to improve the quality of education in northern Nigeria, with a special emphasis on increasing girls' access to quality learning opportunities.

Fitila's overall goal is to increase teacher effectiveness, learning outcomes, and student motivation – so girls and boys are more likely to come to school, stay in school, and be more engaged in the classroom.

Project Impact

Since 2013, the Fitila project has provided intensive teacher training and mentoring, compelling educational videos, and sustainable classroom technology, along with extensive community mobilization in fifteen local government areas of Nigeria. In 2017, Fitila began expanding to **609 new primary and junior secondary school communities**, with the introduction of specific content on building literacy and numeracy skills.

- 609 school communities
- 492 girls' associations established
- 424,363 student learners
- 4,615 community members & school leaders empowered
- 3,813 teachers trained
- 390 educational video segments distributed for classroom learning

"*Now that the program has started, all my daughters are in school. [A man] asked for one of my daughters' hand in marriage. I insisted NO, she must go to school.*"

– A Fitila community member

Sexually Transmitted Grades and the Culture of Silence: Will Female Students Blow the Whistle?

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ABSTRACT

Sex for grades has become a threatening phenomenon in Africa's higher education. Much as many efforts have been made to curb this rising menace, contradicting evidences exist on the willingness of female students to report the act to university authorities.

Purpose
This research sets to find out the opinion of female university students in Africa as to whether or not they will report lecturers who make sexual advances at them in barter for better grades.

Design
Anchored on the principle of Quid Pro Quo the research adopted a quantitative design with literature reviewed on academic corruption in Africa. The method of enquiry was online questionnaires with 78 responses received from the questionnaires sent out.

Findings
Findings of the research suggest that, many (75.6%) would report sexually advances made by lecturers at them for improved grades while 20.5% will not. The remaining 3.9% are undecided depending on different factors. Reasons for respondents' willingness to report the act include, the acts being against their human rights, it not being right, it being unethical and abuse of authority. Respondents who will not report cited not knowing who to report to, fear of victimization, and lack of evidences of the sexual advances.

KEY WORDS: *Africa, Female University Students, Sexually Transmitted Grades.*

INTRODUCTION

In recent times, there have been public outbursts on the level of falling standards in higher education in Africa as a result of Academic fraud (Damtew 2018). While many argue that, the structures that underpin higher education are gradually losing strength, others reason that, students as integral parts of the higher education process are not studying enough to merit the grades, thus relying on cheating to excel (De Bruin & Rudnick, 2007). Amidst these challenges, senior faculty who are expected to positively entrench the image of African institutions of higher learning are gradually being fingered as agents to the falling standards related to academic fraud.

Unlike other stakeholders, a rather surprising and unpopular form that has been identified with senior faculty in recent times is the issue of grades for sex also referred to as sexually transmitted grades. In this regard, lecturers request the express sexual attention of students as prerequisites for passing examinations; failure of which will lead to failure of the student in the lecturer's course. Much as this practice can be perpetrated by both male and female lecturers, it seems in most instances, male lecturers are guilty of the offence; leaving female students vulnerable to male lecturers who will have their ways sexually with these students as barter for marks or nothing. The notion of senior faculty involvement in this form of academic fraud finds supports in the works of Damtew (2018), that academic fraud is not the sole preserve of students. He reports that, academics, staff and management are reported to have been involved in nefarious acts ranging from manipulating and doctoring grades, results and reviews to trading grades for sexual favour.

Sadly, most of these incidences go unreported due to the nature of the incidence itself. Thomas and Kitzinger (1997) aptly puts it this way "Sexual harassment is sustained by silence and surfacing sexual harassment is a risky business". The power relations that enable the existence of sexual harassment can also serve to silence it. A theme in the literature is fear – both of the violence itself and of reporting it". The observations of Kitzinger (1997) is not new in the African environment, especially that, most student are either afraid to say no to the lecturer or are afraid to report the proposed or actual sexual relations to the university authorities for fear. Bagilhole and Woodward (1995) cited in Morley (2011) found under-reporting and underestimation of the incidence of sexual harassment and its effect on women in academia. Their findings support the work of Kitzinger (1997) that sexual harassment in higher education is prevalent. Zindi, (1998) in Morley (2011) also discovered that every student surveyed knew lecturers who 'use their influence to sexploit female students sexually', and 93% of

respondents reported that they 'would not report sexual harassment to any authority', fearing further victimization.

These occurrences in higher education leaves the perpetrators unpunished which continues to cause problems for the victims. Taiwo, Omole, & Omole, (2014) for instance posits that many of the cases of sexual harassment go unpunished and the victims are left to deal with the trauma, which stays with many of them for a long period and sometimes relapses into a psychological condition and mental health challenge. There are also incidences of sexual harassment from male students to female students and some extreme cases of rape where the female student refuses to respond to initial advances. This is also a manifestation of unequal power relation and a gender-based violence that impacts negatively on human rights.

In Africa, the media however has done so well in exposing this act over the years. A cursory examination of the African media landscape, reveals a number of these happenings on university campuses. In the 9th October 2018, edition of the Daily Graphic, three (3) lecturers of the Ghana based University of Professional Studies-Accra were dismissed for allegedly sleeping with students for marks. A similar case was reported of the Botswana Accountancy College on the 6th October 2018 edition of the Botswana Gazette where a lecturer was sacked for allegedly sleeping with a student in order to pass her. On May 23rd 2018, CNN published an article on the Africa category citing one female student in one of the universities in Nigeria involving one lecturer exchanging sex for grade. The student had the option of either sleeping with the lecturer or she fail the exam. A similar incident is reported of a lecturer being dismissed from his post at one of the leading universities in Nigeria for promising a female student higher marks in exchange for sex. The dismissal came after the student in question released a secret recording online in April of a conversation in which the lecturer offered to improve her grade if she slept with him (News24 21st June, 2018). In South Africa, the University of Limpopo suspended a geography lecturer following complaints of sexual harassment against him by a group of female students (Times live 10th October 2018).

A close examination of these facts, suggests that, there is a rise in this form of academic fraud on the continent. What seem unestablished in recent times is the question of willingness of female university students to openly report the occurrences to university authorities. The research thus sets to find out whether female university students in Africa will report lecturers who make sexual advances at them in barter for better grades, identify reasons for their responses and enquire from them, recommended measures to curb the menace.

The above led the research to the following enquiries: (i) would you report lecturers

who propose sex to you in barter for grades? (ii) what are the reasons for your answer? (iii) What measures do you recommend to curb the incidence of lecturers harassing female students for sex in exchange for better grades?

Nevertheless, conducting studies on Sexually Transmitted Grades in a manner that will offer suggestions for appropriate measures to curb its consequences on Africa's higher education requires balancing empirical data and theory.

ACADEMIC CORRUPTION – UNVEILLING THE LITERATURE

Ample studies have been done in the areas of academic corruption in institutions of higher learning. This section looks at some literature pertaining to the practice, especially in the area of sex for marks.

Sexual Harassment Related Sex for Marks in Africa's Higher Education – the Evidences

The practice of sex for marks in higher education is not only dominant within African universities. Studies have revealed that, the practice seem to be a regular feature of academic fraud in higher educational institutions globally. For instance, a report on women students' experiences of harassment, stalking, violence and sexual assault in the UK (NUS, 2010) claims that 68% of women students have been subject to verbal or physical sexual harassment and that nearly one in four has experienced unwanted sexual contact (Morley, 2011). Morley citing Kealey, in Reisz, (2009), further posits that, in spite of decades of gender equity legislation in the UK, a male academic in a private university caused outrage by stating that: "Most male lecturers know that, most years, there will be a girl in class who flashes her admiration and who asks for advice on her essays. What do you do? Enjoy her! She's a perk." Benson and Thomson in Reilly, Lott, & Gallogly (1986) further reported a random survey of 400 women seniors at Berkeley and found that 20% of the women had been sexually harassed by a male instructor at the university while 20% of transfer students reported such experiences at their former schools. Also, a query from the National Advisory Council on Women's Educational Programs sent to colleges and universities in the United States revealed some 1,000 alleged incidences of sexual harassment (Equal Opportunity in Higher Education) in Reilly, Lott, & Gallogly (1986). The above are clear testament that, the act of male academics using their influence negatively on female students is ripe even out of the borders of Africa.

In Africa, Norman, Aikins & Binka, (2012) conducted a study on the traditional

and contrapower sexual harassment in public universities and professional training institutes of Ghana. Their study revealed that both the traditional and contrapower forms of sexual harassment are prevalent in public universities and professional institutes in Ghana and that women at these institutions are more likely to be sexually harassed than men. Nwadigwe, (2007) also conducted a study which focused on the practice of coercing female students to engage in sexual relations with male lecturers ("phallic attack") as a condition for scoring good grades. The study finds that there is a relatively high prevalence of sexual harassment in these universities and this affects female students adversely. The opinions of both Norman etal, (2012) and Nwadigwe, (2007) are pointers to the worrying state of females in African universities being harassed for diverse reasons including enhancing their grades.

Marks & Nelson (1993) in their study on Effects of Professor gender on perception of sexually harassing behaviors revealed that undergraduate students viewed four videotaped vignettes that depicted potentially sexually harassing interactions between professors and students. Subjects were asked to evaluate the professor's behavior. The vignettes were composed so that two dimensions were manipulated: the sex of the initiator of the behavior and the type of behavior. Results of the study provided partial support of the following hypotheses: (1) the behaviors of female professors initiating potentially sexually harassing behaviors toward male students would be perceived as more appropriate than would the same behaviors initiated by male professors toward female students in identical situations," (2) female subjects would interpret the behaviors as more harassing than male subjects; and finally (3) subtle forms of harassment would be interpreted as more inappropriate by female students than by male students. The above revelations give room to reason that, usually, a larger percentage of the sexual harassment incidences pertaining to lecturer and students is skewed to male lecturers making advances to female students.

The occurrences of sexual harassment related sex for marks may take various forms and types. Owoaje & Olusola-Taiwo (2010) in their study on sexual harassment experiences of female graduates of Nigerian tertiary Institutions found that the majority (69.8%) of their respondents had been sexually harassed, with the main perpetrators being male classmates and lecturers. About two-thirds experienced the non-physical type of sexual harassment; 48.2% experienced the physical type. Non-physical harassment included sexual comments (57.8%) and requests to do something sexual in exchange for academic favors (32.2%). Physical forms of sexual harassment included unwanted sexual touching (29.4%) and being intentionally brushed against in a sexual way (28.9%). The works of Imonikhe, Idogho, & Aluede, (2011) also revealed in their survey of teachers' and students' perception of sexual harassment in

tertiary institutions of Edo State, Nigeria that majority of the teachers and students agreed on the prevalence of sexual harassment in their schools and that the range of sexual harassment reported by teachers and students in tertiary institutions was extensive. Their study also revealed the following forms of sexual harassment: sexual comments, jokes, gesture, touched, grabbed or punched, leaned over or cornered, receiving sexual notes or pictures, pressured to do something sexual other than kissing, intentionally brushed up against in a sexual way, had your way blocked in a sexual way, had clothing pulled in a sexual way, had clothing pulled off or down, forced to kiss someone, and had sexual messages written about you on public walls.

Despite the forms or types of the harassment, it will eventually end up in adverse effects against victims. According to Mamaru, Getachew, and Mohammed (2015) on Prevalence of physical, verbal and nonverbal sexual harassments and their association with psychological distress among Jimma university female students. Their study revealed that the prevalence rates of physical, verbal and nonverbal sexual harassments were 78.2%, 90.4% and 80.0%, respectively, while the prevalence rate of psychological distress among students who had experienced sexual harassment was 63.0%. Taiwo, Omole, & Omole, (2014) investigated the occurrence of sexual harassment and its psychological implication among students in five higher education institutions in South West, Nigeria. Their study revealed that many of the cases of sexual harassment go unpunished and the victims are left to deal with the trauma, which stay with many of them for a long period and sometimes relapses into a psychological condition and mental health challenge. This is also a manifestation of unequal power relation and a gender-based violence that impacts negatively on human rights. Imonikhe, Idogho, & Aluede, (2011) also reported that sexual harassment impacts negatively on the academic performance of victims. This notion also finds support in the works of Jones, Boocock and Sem, (2013) that the "New Zealand universities provide a poor level of information and support for students who think they may have been subject to sexual harassment".

Other research studies on different educational institutions of higher learning in many African countries revealed that sexual harassment by male faculty, staff, and students included degrading verbal remarks, unwanted touching, and other types of gender-based violence (Adedokun, Abati, cited in Joseph, 2015).

Causes of Sex for Marks on African University Campuses

The very obvious cause of sex for marks is the sexual pleasure that perpetrators (lecturers) derive from engaging in sexual intercourse with the students and perhaps the shameful fact that such satisfactions are virtually without financial costs to the

perpetrator (lecturer). Much as this seem very obvious, it is my opinion that other factors such as indecent provocative dressing by students, direct approach by student to lecturer in readiness to offer sex for grades, genuine love relationships between student and lecturer and failure of the university systems regarding sexual harassment policies also account for this trend in Africa's higher educational space.

As a lecturer, it is not uncommon to find in African classrooms, female students dressed in manners that are provocative. In such instances where students reveal sensitive parts such as breasts, hips, thighs, back and sometimes panties while in class, lecturers without the morale strength to resist such are likely to fall into what would seem to them an invitation to treat. Such tempting instances, are causal factors to the new trend of sex for marks in Africa's higher education. Fancy dresses portraying sexuality seem very acceptable in many African universities today with ladies usually being the perpetrators. In such instances, ladies are spotted wearing dresses that expose their breasts, thighs, hips or back. This naturally seem to have arousal effects on male lecturers who in tend sometime abuse their legitimate authority over the female students by seeking sex in return for marks.

Empirical studies reveal various causes of sexual harassment related sex for marks in university campuses in Africa. Taiwo, Omole, & Omole, (2014) revealed that some female students who are lazy in their studies sometimes motivate the male lecturers into an unethical relationship with a view to ''use what they have to get what they want", which is a common slogan among such female students who will not attend classes, sit for any form of assessment and would desire to pass their examinations. In support of this notion, an article in the Guardian Nigeria Newspaper on 21 April 2018 by Isa Abdulsalami Ahovi, Jos argues that some lazy female students usually harass lecturers sexually. He noted that, "*despite having some good and disciplined male lecturers and some lecturers who are amorous hawks on university campuses, some female students too do not help matters because they are lazy so at the end of the day after examinations, when they discover they have failed, they meet the lecturer concerned and offer him something to pass them. He added that, despite the Churches, Mosques and other religious organizations we pride ourselves in, they have not helped our girls in that not all male lecturers have the capacity to control their sexual urge watching these girls who dress almost naked. What do you expect? They are human beings. They are not sexually impotent*."

In the same Guardian Nigeria Newspaper of 21 April 2018, the Chairman of the Niger Delta University (NDU), Amassoma chapter of the Academic Staff Union of Universities (ASUU), Stanley Ogoun, in an interview with Julius Osahon noted that sex for mark custom has persisted in human societies including the university system,

because of the human frailty. The pursuit of happiness without moral restraint and consideration for others is another causative factor. Furthermore, those who indulge in the act in the university environment are like cougars who take advantage of their positions to prey on their victims. Also, the refusal of victims to report such acts encourages the perpetrators to continue. When victims, for perceived fear of victimization or stigmatization, fail to report, even the internal mechanism for sanctioning erring staff or students cannot be deployed.

Morley (2011) also found that student poverty provided ideal pre-conditions for sexual bartering. They also discovered that three-quarters of the student sample indicated that the administration failed to deal effectively with lecturers who practice sexual harassment. Beninger's study in Joseph, (2015) however posit that sexual harassment in higher education in Africa is tolerated because most of the victims engage in transactional sex with male professors because of the economic pressure to afford university fees. The works of both authors gives a different trajectory to the reasons why sex is bartered with lecturers by university students. Despite the gains the subject has had in relations with harassment for marks, it is to be noted that, female students also barter sex with lecturers for economic gains. The works of Nwadigwe, (2007) also added that lack of adequate high-quality sex education in Nigeria increases the vulnerability of younger female students to sexual harassment. Also, there are instances, where lecturers have genuine interest in the opposite sex and intend relationships. These usually start as courtship and in due course, leads to all of the favour that persons in relationships do for each other including sex for marks although unethical.

A cursory examination of current trends in African universities also reveals that, students are embolden to seek what they want from lecturers for as long as they can pay the price for such. In this regard, students become bold to the extent of offering lecturers' sex to secure good grades or marks. This seem to be a major causal factor to the canker of sex for marks in African universities.

The Compelling Need for Interventions

The rising trend pertaining sex for marks in Africa's' higher education as captured by recent media reports need urgent attention to curb its consequences on the continent's higher education. The need for urgent action is hinged on the reasoning that, this act may have psychological effect on the affected students especially in instances where they are not the initiators of the contract and or consented out of fear of victimization. Such students may grow with attitudes that are inimical to societal development as a

result of the trauma of keeping sexual secrets at ages they were likely not ready for sex (Taiwo, Omole, & Omole, 2014).

The act further compromises' the credibility of African universities in the eyes of such stakeholders as students, government, employers etc. Implying, stakeholders such as parents may not be willing to enroll their wards in universities with reported cases of sex for marks. Also, industry may lose confidence in the given university for as long as there are media reports that the university is noted for its lecturers sleeping with students for marks.

There are likely perceptional issues related to sex for mark in universities. Many are likely to think that, since lecturers are reported to dish out marks for sex, they are likely dishing out marks for good certificates thus undermining the credibility of the certificates of the university. Further, industry may not be willing to attract graduate from universities who are noted for dishing out marks for sex. There are also tendencies that such products may be discriminated against on the labour market. Further, a university's ranking may be compromised both locally and internationally as a result of reported cases of sex for marks.

Theoretical Underpinnings

Literature reveals a number of theories that apply to the upsurge of sex for marks in institutions of higher learning. This work considers two of such; the Bad Apple theory and the principle of Quid Pro Quo.

The Bad Apple Theory primarily focus on the individual as the cause of corruption in the world. The theory postulates that corruption exist because we have people with immoral traits and these group of people are called 'bad apples' (De Graaf, 2007). Further, Graaf (2003) opines that "there is a causal chain from bad character to corrupt acts; the root cause of corruption is found in defective human character and predisposition toward criminal activity." This theory also argues that, the cause of corruption is linked with human weaknesses like greed. The theory further postulates that when the concentration is on the defective characters of an office holder, morality then begin to regulate behavior. This theory is very important for this study because it complements the main concept (Quid Pro quo) to explain the causes of academic corruption in higher educational institutions. By the postulations of this theory, people engage in academic corruption because they have defective behaviors that influence their actions.

The concept that aptly describes the phenomenon under study is the concept of

quid pro quo. This is a relationship where an individual compromises or barters one thing for another. In their editorial of June 1943, the Journal of Forestry, describe the concept in details. They posit that, the word Quid refers to "something given by one side in barter or exchange", while Quo refers to "something received from the other side in barter or exchange", thus Quid Pro Quo refers to "something for something" or literally something in return.

In this context, the very obvious application of Quid Pro Quo is evidence in lecturers demanding sex from students and in return awarding good grades to such students or students proposing sex to lecturers in order to obtain good grades. It is further evidenced in the students, accepting the good grades from lecturers and in barter satisfy the sexual desires of the lecturer or lecturers accepting sexual desires in order to award good grades to students.

METHODOLOGY

The study comprises of all current female university students in Africa as at 2018/2019 academic year. Snowball sampling technique was used to reach the sample population. However, a total of 78 female students responded to the questionnaire. Data was collected via questionnaire created through google form and administered to students through social media platforms and electronic- mails. The questionnaire was divided into sections A, B and C with section A seeking to find out whether female students would report lecturers who make sexual advances in exchange for marks, section B identifying the reasons for or not if a female student would report a lecture and section C solutions of respondents to curb the problem. The study was analyzed using descriptive and content analysis, thus the student' responses together with literature reviewed on the subject is the foundation of the content analyzed. This is the basis on which recommendations and conclusions have been drawn.

Ethical considerations were adhered since respondent's voluntary participation in the research was stated on the questionnaire. Respondents were made aware that there were no foreseeable risks, discomfort or adverse effect in participating in the research.

PRESENTATION OF FINDINGS

Empirical evidences from the research suggests that, many students will report the incidence of sex for marks in their various universities. Out of 78 respondents, 75.6% agreed that, they will report lecturers that make sexual advances towards them, 20.5% stated they would not report whilst 3.9% were undecided. The graph below depicts

the responses.

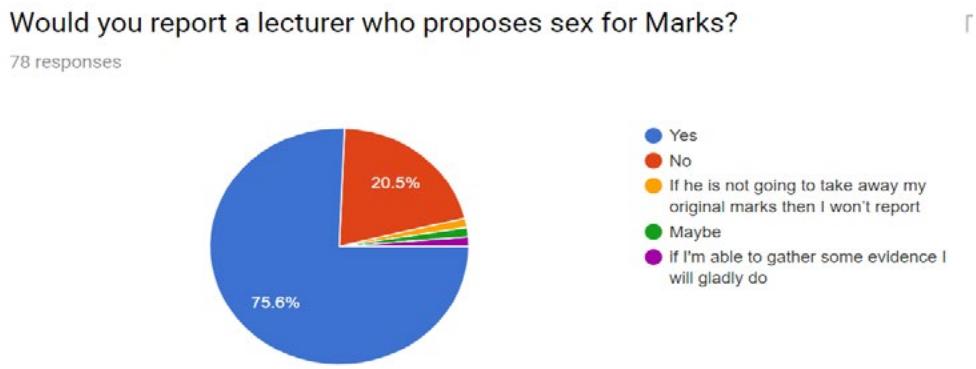

Figure 1: Willingness of Female Students to Report Lecturers who make Sexual Advances in Return for Good Grades

The graph above shows that, 75.6% of the respondents will report a lecturer who makes sexual advance to them for marks, while 20.5% will not. The remaining 3.9 will or otherwise depending on different factors.

DISCUSSION OF FINDINGS

The findings as reflected on the figure above are analyses under key headings below.

Why Female Students Will Report Male Lecturers Who Demand Sex for Marks

Figure 1 shows majority of female students will report lecturers who make sexual advances at them better grades. This result is however contrary to an earlier research by Zindi, (1998) in Morley (2011) that 93% of respondents reported that they 'would not report sexual harassment to any authority', fearing further victimization. A number of reasons accounts for the high levels of willingness to report sex for marks related harassments. One of such is abuse of human rights. One female student aptly puts it as captured below;

"Because I came to school purposely to acquire the knowledge, I lack based on the course I am offering. For this reason, anything I have been taught I must be tested to see my level of understanding. So, if I make mistakes, I need to be corrected by rewriting the test again and by so doing I would be corrected. So, if I make mistake and the lecturer

is requesting for sex to get me the best grades, I will not accept that and as well report him to the authorities of the school. If I don't do that, it won't help me to learn". Another female student simply states that she will report a lecturer who propose sex for marks *"because it is a violation against women's rights"*. This response finds support in the works of Taiwo, Omole, & Omole, (2014) that Sexual harassment takes on various trends and nature, but most importantly, it emanates from unequal power relation that is also associated with gender-based violence and violation of human rights.

Apart from these, other reasons have accounted for the willingness of female university students to report these cases; "I will report to a trusted higher authority because the lecturer will most likely fail me in his courses even if I pass if I refuse to agree to his sexual demands". A student responded that she will report because it will be a manner of overcoming impunity.

Some of the respondents were of the view that, they will report such occurrences when they arise because it is not right, not ethical and professional for lecturers to do so and it is against the university's rules and code of conduct as well as abuse of authority. Others opine that they will report lecturers that demand sex for marks because sex is not the best academic measures for good grade or pass and also lecturers are to help them understand what they are being thought. Therefore, if they are awarded marks by virtue of sexual compromise then their schools will not produce individuals who qualify to improve society. This notion is supported by the works of Imonikhe, Idogho, & Aluede, (2011) that sexual harassment impacts negatively on the academic performance of victims.

Finally, some female students responded that, they will report such cases only when they have enough evidence because without evidence they won't be taken seriously and since the said lecturer may have an upper hand, there is a likelihood everything will be turned against them. These direct responses from students are strong pointers to the fact that, female university students are getting embolden to voice out this crime given the necessary enabling environment.

Why Female Students Will Not Report Male Lecturers Who Demand Sex for Marks

The research revealed that, 20.5% of respondents will not report lecturers who demand sex for grades. This percentage of response seem minimal compared to the works of Zindi, (1998) in Morley (2011). Morley's reported that, 93% of respondents indicated they 'would not report sexual harassment to any authority'.
Diverse reasons where however identified for the above responses. One of the reasons

identified is that, students do not know who to report to since most universities do not have outfits for such complains. The response from one student captured below sums it.

"Because there's no one to report to, only friends you can tell but not administrator or those in authority, they would demand for an evidence you can't provide".

The above is a pointer that, there may be occurrences of male lecturers demanding sex for marks from female students but such occurrences are not reported because of lack of evidence and trust in school administrators. This notion finds support in the works of the American Association of University Women in Taiwo, Omole, & Omole, (2014) that, in the occurrences of sex for marks, female students are most at risk as victims while the male lecturers are more likely to be the perpetuators.

Another respondent said, she will not report any case of a lecturer demanding sex for marks. Her response is captured below'

"There is no need for me to report a lecture who makes sexually advance at me in exchange for good grades, I will just ignore him and wouldn't want to make it a big issue".

The opinion of this student may stem from the reasoning that, the student thinks no action can be taken even if the issue is reported. In support of this notion Leach in Joseph (2015) states that, some victims are also reluctant to report their abuse because they believe that no action will be taken against the perpetrator if they report incidents, because many of the perpetrators are not punished, especially in undeveloped countries.

This may also be stemming from the reasoning that, some victims of sex for marks on university campuses do not find the need to report to authorities but will be discussing such occurrences with their friends and colleagues resulting in the lecturer losing respect and being humiliated. Pearlin, in Taiwo, Omole, & Omole, (2014) support this notion by emphasizing the psychological symptoms of sexual harassment to be negative outlook, irritability, mood swings, impulsivity, emotional flooding, anxiety, fears of loss of control, excessive guilt and shame, compulsive thoughts, obsessional fears, crying spells, persistent anger and fear, decreased self-esteem, diminished self-confidence, decreased concentration, feelings of humiliation, helplessness, vulnerability and alienation.

Further, another respondent reported that, she will not report an occurrence of sex

for marks because she does not know whom to report to. This notion of the student could be as a result weakness in the higher educational system to report such cases as backed by the works of Leach in Joseph, (2015) that sexual harassment in education is higher in countries with weak educational systems, low levels of accountability, high levels of poverty, and gender inequality. This notion also finds support in the works of Jones, Boocock and Sem, (2013) that the "New Zealand universities provide a poor level of information and support for students who think they may have been subject to sexual harassment".

Some female students also responded that they will not report any incidence of male lecturers demanding sex in return for good grades citing fear of victimization and failing. This response however finds support in the works of The Star/Asia News cited in Joseph (2015) where a survey in South Korean universities found that 65 percent of the victims did not report their victimization mainly because they were afraid of future victimization which could include being blamed for the incident(s), stigmatization or ridicule. In addition, in South Korea, one of the main reasons why the female victims fail to report their victimization is that the universities mandate that the victims submit their names, phone number, and details of the abuse when they file a report. Consequently, many students refrain from reporting their victimization. A student responded that "If I have a special relationship with the lecturer then I would not report". This respond means that female students' relationship with their male lecturers will determine whether they will report any occurrence of sex for marks on university campus or not.

CONCLUSION AND RECOMMENDATIONS

Evident from majority of the responses, it is concluded that female students given the right environment, will report lecturers who make sexual advances at them for the purposes of grades.

However, the research also reveals that, some (not in the majority) female students would rather remain silent about successful or non-successful quid pro quo than report the incidence to university authorities. As evidenced in the statements, it does seem that, most African females treat the issue of sexuality very sacred thus in instances when it even worrying, they may still be quiet. It should be noted however that, in some instances, this culture of silence stems from the genuine likeness of the female student to benefit from the barter.

Underpinning these statements are clear opinions of confidentiality and secrecy about

what is supposed to be criminal. The culture of keeping silent on anything sexual has had effects on many fibers of African society and the African higher education space is no exception.

Remedies for Sex for Marks in Africa's Higher Education

One remedy that is applicable to the problem of sex for marks is lectures should not mark the scripts of their students. In that vein, a lecturer's academic work with a given class should end when his examination has been written. The marking scheme of the given lecturer should be handed over to a different non-predetermined lecturer to mark. The embarrassment associated with informing another lecturer to pass a student, will curb this menace if not totally eradicating it.

Regulations about lecturers not relating with students sensually, should be in the faculty handbook and it should be enforced. University authorities should ensure that, lecturers are made aware of the implications of engaging sensually with students ahead of time; including that, lecturers cannot marry their students while they are both engaged in the same university in different capacities

Lecturers found culpable should be named and shamed to serve as deterrent to others. Also, both the students and lecturer should be punished when found guilty. There should be enough sensitization to be able to empower woman to be bold to report these lectures. When the lectures know that the students will report them, they will minimize and eventually stop harassing female students.

Female students should study and that would be a proof to their good grades in case of investigations of victimization.

There should be flexibility in laws and ladies be encouraged to report such issues without victimization from other lecturers.

Good supervision of lecturers and open communication channels between students and school authorities should be in place.

Originality/value

This paper will contribute to the conceptualization of sex for marks in African universities which will help to improve theory, research and practice in all fields concerned with curbing academically dishonest practices in African institutions of higher learning.

Acknowledgement

My appreciation goes to Professor Peter Okebukola and Professor Juma Shabani for the mentorship in academic writing. I also will use this to Solomon Yeboah and Ms. Naomi Alabi for their numerous inputs in the study.

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The Place of Peacebuilding in Ethiopian Education: An Integrative Review on Educational Policy and Practice

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ABSTRACT

The purpose of this research was to investigate the place of peacebuilding in Ethiopian education through analysis of education policy and practice-based reviews. The study also aimed at developing a model that could be used as baseline for peace-building education. A contextual discourse analysis was used to materialize the study. To this effect, specific reference was made to policy and practices of Ethiopian education in the feudal, socialist and federal systems; the units of analysis being policy articles, research findings, education sector reviews and proclamations. Reference was typically made to history of education, policy pivots, objectives in proclamations and summaries in education sector reviews. The findings indicated that, education policy items, proclamations and stage-based educational reviews on performances did not directly consider plans and practices of peacebuilding and social cohesion through education at large. The major determinant was lack of focus on conflict management and peacebuilding. The writer suggests the Three-Ps Model embracing Prevention-Protection-Promotion to be the basis for managing conflicts and transforming situations for peacebuilding. The paper also discusses cultural elements as possible inputs for peace literacy.

Key Terms: *Policy; Practices; peacebuilding; Ethiopian; Education*

INTRODUCTION

Education is a productive and progressive means of social change and sustainable development (Setiadi, Kartinadinata & Ayami, 2017) for which success demands a *peaceful environment* and *human exchange in a genial* manner. In that, one of the big and cost- effective mechanisms of societal progress is peace and peaceful living (Webel & Galtung, 2007). By far, it is hard to imagine economic development without peace. It is apparently hard to improve citizens' life standards without peace. Historical, cultural, linguistic and environmental concerns also get one core point in common: peace and security (Hove,2012). Education is also believed to raise citizens' standard of thinking and doing things so that they can devise means of using unity with diversity. There are also expectations airing that, through education, there can be even gates for social cohesion (Sara, 2016). With that open truth, there are certain issues that are topical for research and scholarly analysis which lie behind responsiveness of education for peacebuilding. By and large, the nature and extent of provision on peace literacy with respect to boosting skills on the creation of national consensus, reducing partiality and heightening fairness, creating an environment of group tolerance among diverse parcels of the community, and communal guarding of peace remain to be points of deep concern (Omeje,2014).

In Ethiopian education, policy and practices of peacebuilding do not seem to have been given due attention. For instance, in the feudal era, education was mostly meant to run the state bureaucracy; and, hence itself became the fuel for mass struggle (Teshome, 1979; Tekeste, 1996; Messay, 2006). In the socialist era, education was dominated by the imported ideology of Marxism-Leninism, and failed to respond to past and existing demands of the time (Medhane, Dade & Alagaw,2016). Even, researches directly related to policy and practices of peacebuilding have also been very rare. For instance, Dessu (2018) indicated that, peace education as a theme was not integrated into the functional adult education program of Ethiopia even though there are peace education related concepts. However, the research touched issues related to Functional Adult Literacy from thematic point of view, and that, it did not deal with integrative analysis of policies and practices across Ethiopia. Moreover, its focus was on the non-formal education.

Tamene (2013) in the research exploring indigenous Psycho-Social dispute resolution practices, addressed the contributions of *Gumaa*1* to conflict resolution, justice administration and peacebuilding from psycho-social perspectives. But, the research did not align the practice with anyone of the educational policies and practices in Ethiopia. These and other researches highly dealt with exploring the traditional

cultural assets that have had peace-making values. However, they failed to present a critical indicator for the place of peace-building lessons in the formal education system.

So, this research was aimed to be a gap filler in effect since discussions on violence were common; explanations on the likely causes of disputes were paramount from all corners but the role of education in peacebuilding was rarely addressed. In that, the research focused on answering the following questions:

Basic Question: How far do Ethiopian formal education policy and practices support peacebuilding with respect to strengthening peace literacy, inclusive diversity and social cohesion?

Specific Questions

- How far does the education policy address peace literacy?
- What roles of inclusive diversity treatment are underlined?
- How far do sector reviews address peace in education?
- What are the key determinants of peacebuilding through education?

Objectives of the Research: The research sought to achieve the following general and specific objectives.

General Objectives of the Research:
To explicate the extent to which education policy and practices represent peacebuilding with regard to peace literacy, inclusive diversity and social cohesion.

In specific, the research sought to:

- Identify the extent to which the education policy addressed peace literacy;
- Make out the place of inclusive diversity and social cohesion in education policy and practices;
- Underline key determinants of peacebuilding through education.

SECTION TWO

THEORETICAL FRAMEWORK OF THE STUDY

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Peace-education and peacebuilding

The trend of peacebuilding goes with peace education, the process of promoting knowledge, skills, attitudes and values needed to bring behavioral changes that will help to prevent conflict and violence (Omeje, 2014:2). Peacebuilding works for people of different age groups at both personal, group, societal, national and international levels (Omeje, 2014:4). Broughton (2013) traces essential some elements of developing nonviolence such being power-based work of taking corrective actions on violent actions; right-based work of developing accountability; interest-based work of mediating agreements around community's daily life, and using diplomatic means that bring opposing sides to recognition of common interests.

Sara (2016) presents peacebuilding through education as thinking and acting systematically with long-term vision for a society that is inclusive and just, through peace-oriented learning, engagement and governance. While Omeje (2014) and Broughton (2013) present peace- education in the constituent and corrective manner, Sara (2016) presents peace-education as a process of engaging people, as something they do for themselves.

Mackatiani, Imboval and Imboval (2014) who assert that, discussion about conflict resolution and peacebuilding remains topical to African academic discourses. In that, peacebuilding involves addressing the root causes of violence that are manifest in the form of structural and ethnic violence and leading into direct violence. According to Smith (2010), education is an essential tool for human development and eradication of poverty, which could be successful in peaceful contexts. In that, loss to the education system due to conflicts is loss to the individual and the society. Hence, education at all levels, could have preventive (the likely occurrence of conflicts); protective (keeping and sustaining educational services running in conflict situations), and transformative (contributive for improving the peace process) roles. Overall, peacebuilding through education is believed to come true through active role assumption of the academics who should workout means of resolving conflicts through educational interventions, in the form of healing, reintegration and reconciliation (Sara, 2016).

Basics of peace literacy

Literacy in its bold style could be presented as a discrete set of cognitive skills of reading and writing, decontextualized and independent of the learners' social backgrounds (Pousada, 2017). But, contemporary trends have come to widen the practice of literacy to be communicative and political that constructs, legitimizes, and reproduces social power structures (Pousada, 2017:7). One such a power lies in peacebuilding for which peace literacy is very essential.

Pousada(2017) also asserts that, peace literacy is an important process in human life that enables to understand diversity, equity and inclusive interchange. This appeals to Chappell (2017), who traces certain tools in peacemaking which include understanding and healing aggression, learning the elements of universal respect through deep listening, leading by example and speaking to human potential. Maintaining empathy at times seeming difficult is also among the tools. A similar assertion is also given by Sara (2016) who underlines that, peaceful living must be built up on an inclusive culture in order to tackle retention challenges in businesses. In that, if the work or living vulture does not welcome and develop diversity, the organization or the hosting institution cannot be healthy. Korb, Cornelus, Emanuel and Salvagui (2010) also state peace literacy as a good tool for fostering the development of skills and attitudes related to peaceful co-existence when properly used by teachers with children at formative years.

Forms of peace literacy

There are some forms of peace literacy which Chappell (2017) earmarks as foremost strategies. One of these is literacy in shared humanity representing meaning of humanity, human condition, communalities or common properties which help people to understand themselves and stand manipulation of different sorts. The second form is peace literacy in the art of living, which presents living to be the most difficult form of art about which most people never learn definitely. Chappell (2017:5) argues that, many children are not taught essential life skills as part of the art of living. In that, some parents either do not teach their children or teach them wrongly or even do not know that art themselves. That drives society into failure to induce purpose, meaning and happiness in life.

The third form of literacy goes to the art of waging peace, which points out that, people, especially in the military, know how to wage war, but mostly lack skills of bringing back peaceful situations. So, Chappell (2017:8) adds, it is simple to make the world different by developing literacy in the art of peace-creation. The arts of listening, taking responsibility to human life, and protect the environment are also the other forms of peace literacy (Chappell, 2017:9).

SECTION THREE

METHODOLOGY OF THE RESEARCH

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2.1 Research design

This research looked into the place of peacebuilding in Ethiopian education in order to identify the role of education in peacebuilding. Antecedent to the role of education were also inclusive diversity and social cohesion as addressed in the theoretical framework. To this effect, qualitative survey research based on contextual discourse analysis (Rogers, 2010) of policy and practices in Ethiopian education with respect to peacebuilding was used. Core issues of peacebuilding across regimes and the place of educational provisions in peacebuilding were points of concern. The analysis referred to available policy documents, research findings and education sector reviews the analytic framework of which ran as under:

Identification of data types and sources

For the realization of the study, review of existing educational policy, survey of education sector review, educational proclamations and empirical studies was made. For the selection of the sources, three methods were used. The first method was chronological method wherein documents were identified on the basis of the three governance units (the feudal, socialist and federal) such that, educational policies, education sector reviews and research works were assessed. The feudal and socialist education systems were meant for background purpose, to give umbrella exposure. The second method was subject-oriented reference to historical and philosophical writings in the country with respect to their contributions for peacebuilding through education. Here, both primary and secondary sources of data were used since getting primary sources was a bit difficult in Ethiopian context of weak archival system. The third method was logical interconnectedness of the chronological and subject-based resources with respect to developmental effects on peacebuilding.

Samples and sampling techniques

For the identification of key points, first topics related to rights, peace, democracy and revolution were categorically identified and given spaces for due consideration of peace literacy, inclusive diversity and social cohesion were identified. Accordingly, three policy- related documents, three narrative documents on Ethiopian Education, and five educational sector reviews were purposively selected, the purposive focus

being their pertinence to the issued questions. On that base, clarifications and reflections given at policy and practice levels were made with the support of pre-identified checking guides.

Procedures of data collection

Data for this research were collected through identification of pivots focused on both situated and contextualized modes. For this purpose, units related to educational policy goals, objectives, and focal challenges in policy implementation and research were looked into. In education policy, emphasis was given to references made to peacebuilding at the level of objectives and strategies. In educational sector reviews, reference was made to inclusiveness of peacebuilding issues to focal challenges whereas in researches related to education, pivots related to using peace education as a concerted means of conflict prevention, protection and transformation were given due spaces. All the data were collected through focused notes and reflections. Then, the collected data were organized into structures in the document outline in relation to components of the peacebuilding in education (Rogers, 2010).

Analysis of data

The identified structures were thematically analyzed based on reflection made on policies, education sector reviews, references in educational proclamations and research findings with respect to peacebuilding through education. In the analysis, reference was made to units such as objectives, major challenges, strategies and findings which were stated to solve problems related to education, and prospective solutions to conflicts. The points were, so far, related to conflict prevention, protection strategies and transformation mechanisms in the post-conflict situation (Omeji, 2014; Sara, 2016; Chappell, 2017).

SECTION FOUR

RESULTS AND DISCUSSION

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This part of the study dealt with presentation of data through narrative analysis which procedurally included Ethiopian education policy, education sector reviews and proclamations set on Ethiopian education policy and practice with respect to peacebuilding through education. For the purpose of reflecting on the current policy and practices of peace- building education, the contemporary education policy of Ethiopia (1994 to the present), with related education sector reviews and a proclamation were looked into.

Peace education: policy and practices during contemporary era

The new Education and Training Policy in 1994 had its expository base on the failures of the previous regimes. The introduction of *mother tongue education,* creation of access for all school-age children, opportunities for the formerly marginalized ethnic groups and regions, possibilities for regional states to produce their own curricula in the levels where mother tongue education was used, and decentralization of the administrative structure have been among the pioneering achievements.

However, while launching the use of mother-tongue education, past experiences not to use were not traced. Language policy has not been developed and implemented to publicity even to date. The policy itself was stated in the bold-type but the underlying aspects were not stated in detail. For instance, the productive, distributive and regulatory aspects were overrun. Though Ethiopia is divided into regions as per their ethno-linguistic touches, the role of regions in shaping the national policy to their contexts was not clearly addressed. The gap could trigger violence and disputes when very minor changes are proposed at federal level. Even to treat that case, there does not seem to be peacebuilding experiences in the policy on how to use swift and proximate means of communicating cases before they grow harder and courser.

Focus of the education policy

Regarding the focus of the new education and training policy, the following quoted excerpt could be referred to:

> It [The Policy] emphasizes the development of problem solving capacity and culture in the content of education, curriculum structure and approach, focusing

> on the acquisition of scientific knowledge and practicum. It directs that there be appropriate nexus between education, training, research and development through coordinated participation among the relevant organization (Education and Training Policy, 1994: 4-5).

The reference on the focus of the policy states "development of problem-solving capacity." In plain words, the challenges of the previous educational practices were related with highly theoretical and non-user-friendly lesson-delivery system. But, which problems education seeks to solve in relation to peacebuilding is not clearly indicated at all.

Aims of education stated in the policy

In the introduction, the policy statement forwards the succeeding core issues related to aims of education. The first aim relates with pragmatic skills and the second with improvement and change-orientation in order to see better future. The third aim refers to changes expected to come about through the interplay between the environment and knowhow of science and technology. The succeeding two aims refer to human rights and democratic values that are partly related with preventive role in peacebuilding. Integrating education with research- based practice and development is also the other aim. One more aim which could be very much cohesive and brightening could be issue of peacebuilding, for the fact that, changes are always borne with frictions, and if there are no internal and external means of soliciting them, big achievements to be attained remain cross tied. Like in the focus, the aim falls short of addressing peacebuilding with respect to peace literacy, inclusive diversity and social. Further illustration was given in the succeeding pages:

Objectives of the education policy vs. peacebuilding

Objectives of the FDRE education policy included pivots which held development of physical and mental potential, capacity and skill of taking care for and utilizing resources, respecting human rights and standing for the wellbeing of people, achieving equality, justice and peace; developing democratic culture and discipline; differentiating harmful practices; seeking and standing for truth; appreciating aesthetic values; showing positive attitude towards the development and dissemination of technology in society.

Among these objectives, there is one unique role of the education policy; that is, providing education that promotes democratic culture, tolerance and peaceful resolution of differences that raises the sense of discharging societal responsibility. *In practice, however, Schaub (2018) asserts that, the Ethiopian education policy has*

had a very little space in addressing diversity among the diverse ethnic groups and multicultural issues without which there can seldom be peacebuilding. Adunyarittigan (2017) states, in this respect that, ethnic-based and related conflicts could be striking conditions on the quality of teaching and learning. So, ***critical peace literacy*** can be used as a strategic instructional tool which aims at reaching a nation's citizens to raise their awareness, so that they can handle conflicts positively.

Unfortunately, that parcel is missing in the policy objectives. Perhaps, there are some constructs related to civic rights and responsibilities, ethnic inclusion and democracy which are incorporated into the policy. But, the realization of such cumulative skills and rights is through peace. It must be for that reason that, Maslow identified the security need to be second in the list of human needs hierarchically set, which comes immediately after the existential needs (McLeod, 2018).

To some up, the policy as a document had five virtues which prior policies basically lacked: diversification of skills; practicality of learning outcomes; decentralization of administration; improvement of traditional practices through education, and increasing mass participation. Yet, it highly overrun issues of peace literacy, inclusive diversity (how to recognize, respect and involve people of differences), and creating social cohesion (integrative social action and reaction).

Ethiopian education sector reviews and practices of peacebuilding

The education sector review process revolved around the realization of educational goals and objectives as per the policy and guidelines for education. In this review, a brief critical survey was made in order to validate the education sector reviews in the pro-Derg time to reflect on peace-literacy, inclusive diversity and social cohesion. The first review was made to the **Education Sector Review-One** (Destefano & Wilder, 1992). As observed in the document, key issues were related to access and equity, regionalization, language of instruction, practical and academic schooling, changing role of EMPDA, and budget levels.

Education Sector Review Two dealt with budget and expenditure, access, quality, efficiency and equity. In that, further steps were taken to increase enrolment rate, improve quality to sustain completion rate, and create conditions for teachers' effective and efficient use of skills so that parents could develop confidence in the schools. With the education sector plan, there were certain setbacks to be handled in unison which pertained to teachers' lack of skill, shortage of qualified teachers, weak program management, inadequate planning and management capacity, greater push on enrollment, and mixed entertainment of overages and school age children.

The concerns of Education Sector Review Three were access and equity, quality and relevance, efficiency, decentralization, budget allocation and financial utilization, and cross- cutting issues. Under cross-cutting issues civic and ethical education was presented as one concerned with societal peace which pertained to producing good and responsible citizens who understand, respect, and defend the constitution, democratic values and human rights.

Education Sector Development Program IV dealt with certain challenges in the education system which pertained to general education, technical and vocational education and training, and higher education. While the focus of the ESDP IV would be very essential, it becomes crucial to underline what befell educational practices in Ethiopia during the ESDP implementation. In the first place, educational institutions could act autonomously. Rather, they underwent series of challenges in student enrollment with massification. Teachers had triple roles. On the one hand, they had to teach their respective fields, as per their task duties. On the other, they had to entertain individual differences among the students which related to gender, location and languages.

As seen in the document, *enrollment* was seen as the most desirable duty but what mattered was providing usable education which could relate with the life of the pursuant. In Ethiopia, primary education was so far provided by teachers of very low standards with minimal in- service training and on-job inductions. Furthermore, there was no difference between a hardworking and submissive teacher as far as experiential validity was concerned. Assignments to positions and promotions were made on the basis of nepotism and political affiliation. So, the surface treatment of the challenges was indicated in the very statement of the challenges. They were not clearly and completely addressed. In that, the principles and practices had conflicting verges but the way to resolve those conflicts and build peaceful working realms was not underlined. To sum up, the first sector reviews of Ethiopia did not take issues of peace-building education as any big concern.

4.9 Analysis on educational proclamations

In Ethiopia, there have been considerable proclamations which focused on ensuring the legitimacy of the educational practices in the country. In this section, the place of peace education and practices in the expected values and objectives of each proclamations was looked into. The analysis flows from the recent to the past in brief.

Ethiopian higher education proclamation (650/2009)

The Ethiopian higher education proclamation had such objectives as all-rounded

development; research that develops knowledge and technology transfer as per the country's needs; freedom of expression based on reason and rational discourse, free from biases and prejudices; community and consultancy services; institutional autonomy with accountability; stakeholders' participation in institutional governance; promoting and upholding justice, fairness and rule of law in institutional life; promoting democratic culture, and upholding multicultural community life; and, ensure fairness in the distribution of public institutions and expand access on the basis of need an equity.

Core values of Ethiopian higher education

The core values listed in the Ethiopian higher education indicate pursuit of truth and freedom of expression; institutional reputability based on successful execution of mission; competitiveness in scholarship and cooperation with other institutions; institutional autonomy with accountability; participatory governance and rule of law; justice and fairness; a culture of fighting corruption, and quality and speedy service-delivery. Economic use of resources, recognition of merits, and democracy and multiculturalism are also core values. Based on the analysis of documents on educational policy and practices so far documented through the Education and Training Policy (1994); assessment made on the education Policy (2016), and the different education sector reviews and proclamations, the Ethiopian Education System had little responsiveness to peace-building. In that accord, developing an inclusive model throughout, with all its inflections to peace and peacebuilding could be ascertained regardless of the striking notions of change in politicization.

SECTION FIVE

CONCLUSION AND RECOMMENDATION

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Extent to Which Education Policies and Practices Address Peacebuilding

Ethiopian education policies so far used had very little room for peace literacy in curricular and practical realms. For instance, education policy during the feudal regime highly stressed educated human resource in an instrumental manner, in a way that it could work for the king and the nation overall (Teshome, 1979; Messay, 2006). It did not give much attention to individual development which could realize the mental, physical and emotional aspects of human development. Educational opportunities were also rarely distributed to all citizens. As a result, mass consciousness was very low about the change-driving role of education. The successor regime, socialism started with a new agenda, of which policy focused on pillars such as production, research and political consciousness (Teferea, 2005). Once again, the individuals' developments and their peaceful contributions for their own lives and their society were not included into their education. The federal education policy also focuses on basic, social, ethical, problem-solving and innovative skills but bypasses peace and inclusive- diversity. Though the nation is multicultural in its composition, there is no discipline referring to peacebuilding and inclusive diversity. The greatest determinant in all the transfer of power has been the fact that, the country has never had a peaceful power transfer. The feudal regime saw decay by force of arms, and so was the socialist regime. The same experience is now being manifest in the time of EPRDF.

Suggested peace-building curriculum model

The Ethiopian education system, allover, tends to serve those in power and their top-down plans. Perhaps, to treat the top-down flow of orders, and make the education system responsive to the people's needs, further research is deemed essential in terms of cultural validation and transformative use of experiences. This must, specially, be held on peace education. for the momentary peacebuilding attempts to cross to generations of peacebuilders, education must be guided by the succeeding model:

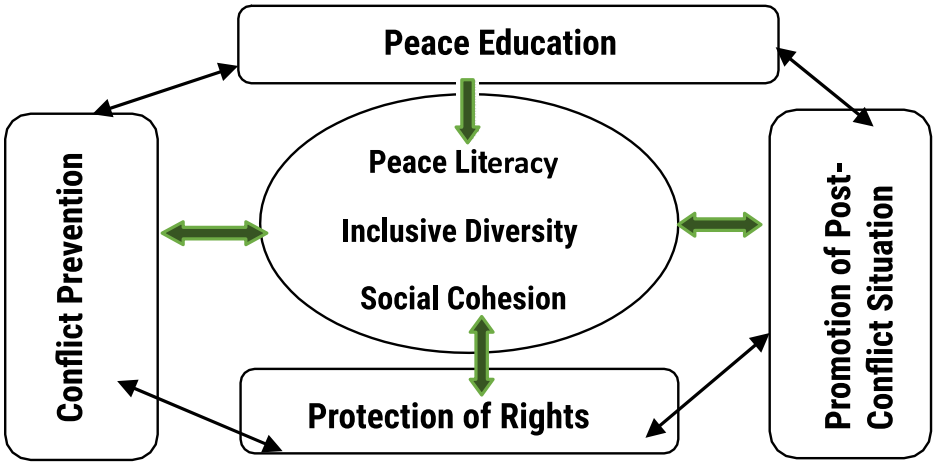

Figure 1. A model for peace-building education

This model is with the pointer that; the first issue lies in *preventing the likely distortion of peace* since peace does not preclude absence of conflict but how to use a certain conflict as a means for constructive treatment of differences. For that to prove true, education must be there in a manner to satiate experiential gaps. Conflict comes as the cost of violation, and distortion of peace a result of conflicts. Supporting this model, Navaro-Castro and Nairo- Galace (2010:11) assert that, human beings have to take lessons from the past in order to build a new and better tomorrow for which violence-prevention and understanding the value of peace and non-violence, tolerance, human rights and democracy are essential prerequisites. Building a culture of peace with a collective approach built on trust, dialogue, and collaboration with the proactive involvement and the participation of young people comes to be the ground work for peacebuilding.

The culture of peace will also generate the mindset for transition from force to reason, from conflict and violence to dialogue and reason. So, for Ethiopian peace practices, the above suggested peacemaking model comes to be relevant as it encompasses prevention of violence, protection of individuals rights during conflicts, and promotion of peace building strategies. The notion of individual change as a resource-base for social change is also marked as a realistic and necessary background if society is to retain any hope in the educational system in peacebuilding (Kwon, 2015). The preventive techniques in schools include reducing symbolic violence inherent in the teaching-learning interaction system between teachers and students, reducing stressful control systems, unclear or sarcastic language use; intolerance and

school violence that are, basically, posed as misrecognition. The model is also related to the *protective effect of education* in time of violence and conflicts where educational undertakings can be remedial for ironing out misunderstanding and perceiving education as means of conflict-alleviation (Beleuta, 2017).

5.2 Reflection for further work on policy and practice

The contemporary educational policy and practices in Ethiopia are more progressive in their social inclusion and concern for change, when compared with the policies and practices in previous governance systems. Evidences could be traced of launching mother tongue education and decentralized educational distribution across peripheries.

These issues are topical and bearing on the country's success in its development and transformation. In that, the youth and the entire society have to be educated formally and non-formally about peacemaking and conflict management strategies which open eyes on the forgotten treasures in the culture, and warn society members of the hazard of violence which keeps nipping life and exposing citizens to damage to property and unexpected migration.

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Application of Education Management Information System (EMIS) to Information and Knowledge Management in Academic Libraries

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ABSTRACT

Purpose: *This paper presents the findings of a small-scale research conducted to explore the application of Education Management Information System (EMIS) to information management practices in academic libraries in Zambia.*

Design/methodology/approach: *This research focused on the ten leading public and private universities in Zambia, being; University of Zambia, The Copperbelt University, Mukuba University, Mulungushi University, Kwame Nkrumah University, University of Lusaka, Cavendish University, Apex Medical University, Rusangu SDA University and The Zambia Centre for Accountancy Studies University (ZCAS). The institutions were indomitably and purposively picked, and data was collected using survey questionnaires.*

Findings: *It was established that whereas institutions were aware of the EMIS, there was no clear understanding of its applicability to information management system in academic libraries.*

Practical implications: *This paper fosters an understanding of EMIS and its use to gain competitive advantage for effective management of libraries to satisfy user needs in the technologically changing environment.*

Originality/value: *There is limited research on information management practices particularly in African universities. This paper therefore adds value to literature and suggests the benefits of EMIS to libraries to enhance information management systems.*

Keywords*: Academic Libraries, Education Management Information System (EMIS), Information Management (IM), Knowledge Management (KM).*

INTRODUCTION

Information is an important resource for any organisation. It is the most crucial element in the modern age, essential for decision making and a determinant in the success of management functions (Adeoti-Adekeye, 1997). The changing times bound by advancement in technology have necessitated the deviation from the way information has been collected, disseminated and accessed, at various levels of management. As the volume of available data continues to grow rapidly, it becomes increasingly difficult for users to find, organise, access, and maintain the needed information (Rah, Gul & Wani, 2010). Institutions have to devise cost-effective approaches to access information, such as the use of Management Information Systems (MIS), that provides a common database from which information required for organizational functions, such as planning, control, monitoring and evaluation and other managerial activities can be accessed to support decision making functions (Riahinia, Behimehr & Seify, 2015).

Academic libraries, as corner stones of university education system, have for a long time been repositories of knowledge and providers of content information to support the objectives of the parent institutions (Marouf, 2017). Since the beginning of the 21st Century, however, academic libraries have been going through a paradigm shift in way they provide information. This has largely been impacted by advancement in the information communication technology (ICT) systems, which have provided endless sources of information for scholars (Ani, Esin & Edem, 2005). These have made libraries to put in place systems to promote better management of information resources in order to remain of relevance to the users in the changing digital environment, and also to redefine their role and leverage their strength in service provision (Islam, Kumar & Ikeda, 2015).

Education Management Information System (EMIS) relate to an organised group of information and documentation services that collects, stores, processes analyses and disseminates information from multiple sources to support education planning, decision-making, policy-analysis and formulation, at all levels of the education strata.

It is an integrated set of entities such as people, technology, models, methods, processes, procedures, rules and regulations that function together to provide a comprehensive set of relevant, reliable, unambiguous data that supports the managerial function of an institution (UNESCO, 2008).

Essentially, the system is designed to be a central data repository, maintaining a systematic inter-sectorial exchange and flow of information to support a range of activities taking places in an institution and includes all the subsystems that rely on the information such academic, human resources, finance, library etc. (Sanyal, 1995). Each sector performs an information service function but interlinked to facilitate the flow of information and generating reports to support management of financial records, resources and staff (Saxena, 2014). These features enable managers to monitor the performance of an institution and provides them with the information required to manage the organisations efficiently and effectively (Echeverría, Santana-Mancilla & De la Rocha Cazares, 2012).

According to Shah (2014), the use of Management Information Systems in educational institutions has been growing. The growth in popularity of use has been attributed to the system's ability to provide quick access to information, its efficiency in administration and higher degree of resource utilisation. The development in computer technology has made it possible for education managers to select the information they require in the form best suited for their needs (Velmurugan, 2013). This has also made institutions to better their operation and deliver quality service to students.

The university library performs specialised functions to meet its constituency's needs to support the activities of the university community. Traditionally, the role of academic libraries had been to provide content and as keepers of information required for research, teaching and academic progress of learners (Husain & Nazim, 2015). However, since the advent of Information Communication Technology (ICT) the library environment has been in a state of transition, experiencing a continuous improvement in the delivery of their services. The use of the internet has tremendously influenced the way information is disseminated, captured, collected, stored and transferred, enabling users to access content from a variety of sources. (Siddiqui, 2003). The widespread use of computers, the exponential growth of internet and quantity of the available online information has compelled libraries to adopt new means and methods for the storage, retrieval and dissemination of information. Services such as the information management systems have been placed and coordinated within the MIS framework, to expand services and improve operation (Ani, Esin & Edem, 2005; Haneefa, 2007; Ramzan & Singh, 2009).

The advantages offered by the ICT have led libraries to provide ICT based information services making them increasingly dependent on the electronic delivery and manipulation of information (Adams, 1995). Services such as the wide area network applications, acquisition of materials, online information services, online journals, library databases and online public access catalogues (OPACs), the automatic circulation and access to the digitised, electronic and online study materials, were now linked together and made available online and other forms of electronic media applications (Husain and Nazim, 2015; Cho, 2011). Such services were once only available in print. This has made libraries to deliver appropriate and quality information at the place where it is desired the most, using ICT based tools. The ICT applications have therefore become a tool with the potential to bring about the improvement in service delivery because of its cost effectiveness and interoperable uses.

This observation is echoed by Ramzan and Singh (2009) who have noted that the ICT and MIS in libraries have become indispensable tools to perform different library functions and to provide innovative services. They have observed that the use of ICT services for instance has helped to eliminate uninteresting and repetitive work such as the duplication of records, once prevalent in many libraries. This has facilitated speedy and easy access to unlimited up-to-date information. The use of ICT has also enhanced the cooperation and sharing of resources among libraries both from within and without the library buildings, in a variety way, around the clock.

Adeoti-Adekeye (1997) also observes that the management information system (MIS) is the cement that binds together the various elements of a library's organisation with one another and with the library's objective of serving its clientele. This observation is based on the premise that library managers need relevant, up-to-date information to reduce uncertainty and to function effectively. Such information as the monitoring of the performance of resources, effectiveness of library services and information needs of users, depends on the information generated from sources such as the integrated management information system. This helps management to make timely decisions and for the improvement of desired services.

However, it is not certain how the ICT tools were being used in academic libraries in Zambia. In this paper therefore, an attempt is made to investigate the use of Education Management Information System (EMIS) in academic libraries and also to establish how the adoption of the information management systems can functionally enhance the library operations, to support the management and provision of library and information services.

METHODOLOGY

This research adopted the survey research methodology. A questionnaire was used to collect data from eight of the ten targeted leading public and private universities in Zambia. Information was solicited by phone interview due to the limited time in which data had to be collected. Information about the practicing librarians in the institutions contacted was obtained from the Zambian Library Consortium (ZALICO) membership list. The participating institutions included the University of Zambia, The Copperbelt University, Mulungushi University, Kwame Nkrumah University, University of Lusaka, Cavendish University, Rusangu SDA University and The Zambia Centre of Accountancy Studies University (ZCAS). The institutions were indomitably and purposively picked, and data was collected by survey questionnaire administered through the telephone interviews. The study sought to investigate the EMIS and its applicability to information and knowledge management in university libraries in Zambia. Collected data was analysed by use of the Statistical Package for Social Sciences (SPSS) version 16.

Results of the Study

Survey responses were obtained from Eight (8) of the targeted ten (10) leading universities in Zambia. Of them four (4) were public universities; being University of Zambia (UNZA), Copperbelt University (CBU), Mulungushi University and Kwame Nkrumah University. The remaining four (4) universities namely; Cavendish University, The Zambia Centre for Accountancy Studies (ZCAS) University, Rusangu SDA University and University of Lusaka were from the private university category. The two (2) universities that did not participate were Mukuba University and Apex Medical University (LAMU), from the categories of public and private universities, respectively. The two universities could not be reached at the time the survey was being conducted. Table 1 below shows the universities that participated in the survey.

Table 1. Participating of University

	Frequency	Percentage
UNZA	1	10.0
CBU	1	10.0
Mulungushi	1	10.0
Kwame Nkrumah	1	10.0
Cavendish	1	10.0
ZCAS	1	10.0
Rusangu SDA	1	10.0
UNILUS	1	10.0
Missing	2	80.0
Total	10	20.0

Librarian's Awareness of the Education Management Information Systems (EMIS)
Table 2 shows that five (62.5%) of the participating universities were aware of the Education Management Information System (EMIS) whereas Three (37.5%) were not. The findings also established that all universities used different forms of Students Management Systems with diverse nomenclature.

Table 2. Awareness of EMIS

	Frequency	Percentage
Yes	5	50.0
No	3	30.0
Missing	2	20.0
Total	10	100.0

The use Management Information Systems (MIS) in the Libraries
The findings relating to the use of management information systems in the library shows that seven (87.5%) of the surveyed universities used some form of management systems to keep their records. Of these four (50%) used KOHA, one (12.5%) used Liberty, one (12.5%) used UNICON Workflows, the other one (12.5%) used Library Gold and one (12.5%) used the manual system. Table 3 shows the different types of management systems used in the sampled libraries.

Table 3. Use of MIS in Libraries

	Frequency	Percentage
KOHA	4	40.0
Liberty	1	10.0
UNICON Workflows	1	10.0
Manual System	1	10.0
Library Gold	1	10.0
Missing	2	20.0
Total	10	100.0

Modules of the Library Management Information System (MIS)

This part of the question relates to establishing the features of the information management used in the university libraries. The findings from the study as shown in Table 4 indicates that seven (87.5%) of the management information systems used in the libraries had the basic features such as the open public access catalogue (OPAC), circulation module, acquisitions module, cataloguing and classification module, serials control module. Only one (12.5%) did not have the stated features as the system used was manual.

Table4. Features of Library MIS

	Frequency	Percentage
All above	7	70.0
Not applicable	1	10.0
Missing	2	20.0
Total	10	100.0

Library Management Information System's ability to integrate with the EMIS

The findings from the study as indicated in Table 5 shows that only two (25.0%) of the participating university libraries were able to integrate their information systems with the campus wide Education Management Information System (EMIS) whereas six (75.0%) could not. However, the levels of integration were partial and was limited to accessing basic students' records such as students' registration details. This information could be imported into the system as students were activating their details on the library management information system.

Table 5. Levels of Integration

	Frequency	Percentage
Partial	2	20.0
Not applicable	6	60.0
Missing response	2	20.0
Total	10	100.0

Challenges associated with the use of Management Information Systems (MIS)

The findings from the survey showed that five (62.5%) of the universities indicated that they faced challenges to use of the management information systems in their libraries. Table 6 shows the challenges related to the cost implications of acquiring the systems such as the Liberty, UNICON Workflows and Library Gold, which in many cases required institutions to pay annual maintenance fees and for system upgrades when required. Other challenges identified were the insufficient knowledge on the operation of the software and inability to integrate and import data from the student management systems, leading to duplication of work and data redundancy.

Table 6. Challenges Associated with MIS

	Frequency	Percentage
No response	2	20.0
Cost of system	2	20.0
Difficulty to operate	3	30.0
Not applicable	1	10.0
Missing response	2	20.0
Total	10	100

Discussion of Findings

Education Management Information System (EMIS) plays an important role to collect and analyse and manage information to support the processes of strategic planning, resource assignation, monitoring, policy formulation and decision making in an institution (Echeverría, Santana-Mancilla, & De la Rocha Cazares, 2012). From the survey results it was evident that that there was no clear understanding of the applicability of EMIS to knowledge and information management practices in most of the studied institutions. The presentation of the various types of information systems and software used in the university libraries and also for the management of students' records, personnel information, official correspondence, financial system, is a suggestive picture of the status of the EMIS in the country.

From the data collected, it was observed that there was sporadic use of management information systems in both libraries and the universities, for management of library resources and student records, respectively. This was further augmented by the findings that one of the biggest challenges faced by most of the studied institutions, was the way information was captured, stored and disseminated. Information was fragmented into multiple places, which made it difficult to work with.It was also evident that the systems in most institutions studied lacked the functionality in automation of library processes and resource sharing which resulted into the institutions' inability to integrate information in one system (Ebenezer, 2002). It could therefore be deduced that this failure could result from among other things, the non-compatibility of the systems in use and the use of unsatisfactory software, which led to the slow progress in automation. Arising from these factors could be thelow level utilisation and inability to incorporate the various systems in use into the Education Management Information System (EMIS).

According to Sanyal (1995) the integration of the various systems of information and files into centralised common files set up, saves on space and time and enables the institution to make evidence-based decision.He further notes that the method minimises the duplication of tasks and inconsistency, scattering of the information, increasing the speed of the flow and circulation of the information in the library. This increases the job efficiency and eliminates the consequences and undesired effects, such as failure to provide customers with the needed information. It was however noted in this study that despite the widespread use of ICT and related technologies in university libraries in Zambia, libraries automation was still in its infancy stage. It was also observed that the development of EMIS was a complex undertaking that required the full participation of all parties involved in planning and eventual implementation. These include the library personnel; administrators and the information technology staff. This eradicates the impulsive use of systems which was not only costly but inhibited the smooth delivery of desired services.

Conclusion and Recommendations

The purpose of this study was to provide an understanding of the role of the Education Management Information System (EMIS), to support the management and provision of information in academic libraries, particularly in Zambia. Information management system has an important role to play an institution of higher learning. It makes an institution to be cost-efficient and effective in its operation, by producing quality and timely data necessary for planning, implementation, monitoring and evaluation of its organisational set-ups (Cuartero & Role, 2018). It creates an assembly point from which the desired information can be obtained for analysis and disseminated

to guide and promote the operation of an institution. From this study however, it has been established that there was no clear understanding let alone use of integrated EMIS in the studied institutions, to foster information and management practices, related to the management of library resources. Consequently, institutions used different and disjointed information management systems in their daily operations. The study therefore recommends the integration of information management systems to provide an effective mechanism for the sharing of data and utilisation of resources between the library and other subsystems. This ensures integrity of data and timely access to information, which enhances the work efficiency and decision-making process (Yang, 2013). This can be made successful by the contribution of all stakeholders such as librarians, ICT staff and university administration, in the process of programme setup and implementation. This would minimise on the identified challenges, relating to software use, inability to integrate and import data from campus-wide information management systems and issues of data redundancy. It would also foster oneness by promoting wider ownership of the programme with a goal in mind of strengthening the institutional efficiency (Trucano, 2006).

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The Changing Face of Higher Education in the Technological Age: A Critical Diagnosis of the Role of Africa Higher Education Institutions towards the Implementation of CESA 16-25

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ABSTRACT

The relevance of technologies for supporting education, training and research at all levels of the educational system has acquired new dimensions and greater urgency in a number of countries including those of Africa. The paper explored the transformative role of technology on higher education delivery in the information and knowledge age and argued that for Africa higher education institutions (HEIs) to play an effective role in promoting the aspirations and the goals of CESA 16-25, they must recognize and harness these emerging educational technologies that promise to disrupt the educational delivery modes and activities of traditional university systems – that characterize the operations of most Africa HEIs. The paper in advancing its key arguments addresses aspects of some of the sub-themes of CESA 16-25 including those directed at strengthening linkages between the world of work and education and training systems; revitalizing and expanding tertiary education, research and innovation to address continental challenges and promote global competitiveness; and harnessing the capacity of ICTs to improve access, quality and management of education and training systems.

Keywords: *Agenda 2063, CESA, educational technologies, higher education, economic development*

1.0 INTRODUCTION

The use of the new and emerging educational technologies to support teaching, learning, research and the administration of the educational delivery processes and systems is fundamentally changing the face of higher education provision worldwide (Dzidonu, 2014). In particular, the unprecedented rapid growth in global communications and educational technologies are no doubt revolutionizing the way we learn and acquire knowledge. The unprecedented rapid growth in information and communication technologies (ICTs) including educational technologies are revolutionizing teaching and learning in higher educational institutions globally. These emerging technologies are rapidly removing the traditional barriers of *time* and *distance* that until now hindered the transfer of information, skills, knowledge, and expertise from one place to another. Computer-mediated communications and multimedia educational technologies are making high-quality educational programs easier to design, develop and deliver than was possible before. It is also making it possible for learners irrespective of their location to use these technologies to access educational resources from anywhere in the world (Dzidonu, 2015d).

Particularly within the context of Africa, these emerging educational technologies apart from providing Africa HEIs with an opportunity to widen access and educate a greater number of its people, can also provide Africa Higher Educational Institutions (HEIs) the opportunity to leverage the *demographic dividend* that African countries are predicted to experience in the coming years to address the continent's human resource development challenges to fuel and accelerate the continent's sustainable socio-economic development as envisioned by the AU's Agenda 2063. The development of human resources, it can be argued, is key to the economic development of any nation. African nations although normally classified as under-developed, have huge untapped human resources that can easily be developed through expanding and improving access to quality education and training (Dzidonu, 2015d). It is being argued that deployment of emerging educational technologies and educational delivery platforms, can lead to the broadening of access to higher education as well as addressing issues relating to quality, relevance, and affordability in a number of these African countries.

The paper argues that the availability of these technological options and solutions to deliver academic programs better and cost-effectively to reach a wider student body and to serve them better has made it imperative for Africa HEIs to relook at how they offer and deliver their academic programs and services as well as support their research work. The paper made the case for the need to support the implementation

of the Continental Education Strategy for Africa (2016-2015) – CESA 16-25 through the deployment and the exploitation of these emerging technologies by Africa HEIs.

1.1 Exploring the Key Drivers of Change in Higher Education in the Technological Age

With the availability of modern educational development and delivery technologies, higher education worldwide is undergoing a major change that will no doubt impact on the capability of Africa HEIs to contribute to and drive Africa's developmental efforts as envisaged in CESA 16-25. Some are predicting that these major changes in the higher education landscape will lead to the demise of the traditional university system in a couple of years, arguing that although past technological advances had made some impact on higher education development and delivery, HEIs to a large extent remained and operated in a traditional university mode for decades. These emerging educational technologies, systems and options, (Flavin, 2012) argued are by contrast *disruptive* and *transformative* in nature and as such have the potential to fundamentally disrupt and transform the mode of operations and the deliverables of higher education institutions including having the potential to transform and improve higher education service delivery in a number of areas including: university administration, curriculum and academic program development and delivery, student-life-cycle administration and services, research work and output, teaching and learning among others.

According to the disruptive-transformative school of thought, a number of key *drivers of change* are driving the unprecedented transformation within the higher education sector globally. We examine below a number of these and discuss their implications for Africa HEIs within the content of their role in supporting the implementation of CESA 16-25.

1. *Democratization of Access to Unlimited Knowledge and Learning Resources* — The massive increase in the availability of knowledge and learning resources online made possible by the emerging educational and communication technologies and the expansion of access to university education in developed and developing markets means a fundamental change in the role of universities as knowledge provision and delivery organizations and agents. Africa HEIs will need to position themselves, to mitigate the effects of the massification of learning opportunities and channels other than the traditional university education route while at the same time taking steps to leverage on and exploit the opportunities made possible by the explosion of learning resources and avenues online to capture and retain their market share of student

enrollment. The phenomenon of the democratization of knowledge and learning sources, avenues and unlimited access to free or inexpensive learning materials and resources online do also present Africa HEIs with some challenges and opportunities. Challenges in the sense that potential students (which could be a source of school fees revenue) instead of enrolling for full-time education at these institutions, may avail of free and relatively inexpensive online sources of knowledge and learning resources to further their education. The opportunities related to the fact that these universities could also position themselves to take advantage of these learning resources online to support their own educational delivery programme offerings.

2. *Competitive Higher Education Market* — Competition in the student recruitment and enrolment market locally and internationally is reaching new levels of intensity, while at the same time as governments globally face tight budgetary provisions to fund higher education. Africa HEIs will need to compete for students and as never before. Competition for local and more so for international students is on the rise, with foreign universities in a number of the developed countries facing falling enrollment in their home market as a result of demographic changes in their population and economy downturn as well as the increasing questioning of the value of higher education, are venturing into the domestic markets of some of the developing countries to either directly recruit students or to set up cross-border campuses.

3. *Funding and Sustainability of Higher Education Provision* – Increasing prospects of higher education funding and sustainability difficulties as African Governments, the main source of funding for higher education in most African countries, reduce their funding obligations mainly due to the economic downturn and pressure on the public purse to meet other social obligations.

4. *The Relevance of Higher Education Debate* – The high cost of higher education and the emerging phenomenon of graduate unemployment are raising questions on the relevance of higher education in today's market place. In the developed economies like the USA, UK and others, the rise in student debts and their difficulty in securing jobs after graduation to pay off the loans they procure to pursue higher education, is putting pressure on higher educational institutions to justify their relevance. In African countries, the relevancy debate is fuelled by the recent phenomena of graduate unemployment in these countries. A number of commentators and stakeholders are also questioning not only the value of higher education products to the economy but also casting doubts on the relevancy of the curriculum and the academic programs of higher educational institutions to the modern economy. The issue of the mismatch between the types of human resources and skills being produced by the universities

and those required to drive modern businesses and industries has been a major concern.

5. Technology – A Key Driver of Higher Education Development and Delivery —The use of technologies to support teaching, learning and the administration of the educational delivery processes and systems are fundamentally changing the educational delivery at all levels of the educational system in a number of countries. Technologies are transforming higher education and impacting on all aspects of educational provision and delivery and transforming the way higher education is delivered and accessed. The learning, teaching and research resources made possible through the deployment of these technologies are now making it possible for universities in developing countries including those Africa to deliver education and training at the same high standard found in top universities all over the world.

6. Open and Distance Learning (OD/L) is Fast Becoming an Indispensable Part of the Mainstream of Higher Educational Systems Worldwide -- OD/L can be perceived as a powerful means to utilize the emerging communications, and multimedia presentation, messaging and educational delivery technologies and resources of the Internet or other organizational and global networks and systems for the delivery of teaching and learning materials and information. OD/L can, in addition to supporting non-campus-based education and learning, be used to complement and supplement face-to-face campus-based education. The deployment of OD/L technologies and educational delivery platforms is leading to the broadening of access to higher education in a number of countries including those of Africa.

7. *Global mobility and the Internationalization of Higher Education (IHE)* — Internationalization is changing the world of higher education -- Student mobility as an aspect of IHE is the fast-growing forms of internationalization relating to transnational education sometimes delivered through off-shore campuses, franchises, joint programmes delivery arrangements (Dzidonu, 2015b). Higher Education in Africa and its internationalization are still primarily driven by external forces and institutions whose main aim is to attract a maximum number of foreign students to generate income and this is no doubt hindering the internationalization of Africa own higher education, specifically in the areas of international student recruitment even at the regional level. While Africa HEIs, hardly recruit international students from outside the continent, the majority of them are not even able to engage in intra-regional recruitment of international students within the African region. If the identified challenges and risks associated with the current regime of IHE are appropriately managed, specific initiatives to internationalize Africa's higher

education system can offer a number of opportunities to Africa HEIs in the area of recruiting international students and engaging in international partnerships in research and other academic collaborations.

8. *Fostering Closer Higher Education -Industry Linkage:* — A number of universities worldwide are responding to the call from industry to produce the graduates they need to drive their organizations and produce products and services needed by the ever modernizing competitive industry and economy. Universities are working with industry through various university-industry linkages to seek their inputs (Dzidonu, 2915a).

1.2 The Case for Critical Role of Africa HEIs in the Implementation of CESA 16-25

According to AUC (2016), CESA 16-25 is a continental strategy that matches the 2016-2025 framework of the African Union 2063 Agenda, meets the Common African Position (CAP) on the Post-2015 Development Agenda and draws lessons from previous continental plans and strategies. It argues that to fulfil its promised bright future, the continent has to come to terms with its education and training systems and that CESA 16-25 was developed to serve as an effective change agent for the continent's sustainable development as envisioned by the AU's Agenda 2063. CESA 16-25 is based on a number of guiding principles, the key ones relevant to higher education development include:

- Knowledge societies called for by Agenda 2063 are driven by *skilled human capital*.
- Holistic, inclusive and *equitable education* with good conditions for *lifelong learning* is a sine qua non for *sustainable development*
- Good governance, leadership, and accountability in *education management* are paramount.
- Harmonized education and training systems are essential for the realization of *intra-Africa mobility and academic integration through regional cooperation.*
- *Quality* and *relevant* education, training, and research are at the core of scientific and technological innovation, creativity and entrepreneurship.

The underlying premise of CESA 16-25 is that education (in particular higher education) can serve as an instrument and a major change agent in driving Africa's development process and efforts. As stated in AUC (2016), CESA 16-25 is driven by the desire to set up a "qualitative system of education and training to provide

the African continent with efficient human resources -- through the reorientation of Africa's education and training systems to meet the knowledge, competencies, skills, innovation and creativity required to nurture African core values and promote sustainable development at the national, sub-regional and continental levels". The fundamental argument put forward in this paper as part of making the case for the critical role that Africa HEIs can play in the implementation of CESA 16-25 to drive Africa's development agenda is based on the following three premises that established the link between higher education and development in the technological age (Bloom, Canning & Chan 2006, Dzidonu, 2015c)::

Knowledge Workforce is a Key Determinant of Economic Development in the Information and Knowledge Age: In today's technological age dominated by information and knowledge, a nation's development depends very much on the extent to which it can develop and deploy its knowledge workforce. In both the developed and developing economies, it is not possible to embark on and sustain rapid economic development and growth without a rich pool of knowledge workforce (either domestically developed or foreign imported). Higher education is one of the key avenues for developing the needed knowledge workforce.

Higher Education is Key to the Development of the Knowledge Workforce Needed for Driving Economic Development in the Emerging Information and Technological Age: According to (Castells, 1994, p.14), "Higher education is an important form of investment in human capital, it can be regarded as a high level or a specialized form of human capital, contribution of which to economic growth is very significant. It is rightly regarded as the "engine of development in the new world economy. Higher education, can contribute to economic development in terms of facilitating the rapid industrialization of the economy, by providing manpower with professional, technical and managerial skills: and within the context of transformation into knowledge societies, higher education provides not just educated workers, but knowledge workers to the growth of the economy; furthermore, higher education helps, through research, in the creation, absorption, and dissemination of knowledge and innovation. It is also pointed out in (OECD, 2008) that: tertiary education contributes to social and economic development through four major missions: the formation of human capital (primarily through teaching); the building of knowledge bases (primarily through research and knowledge development); the dissemination and use of knowledge (primarily through interactions with knowledge users); and; the maintenance of knowledge (primarily through inter-generational storage and transmission of knowledge). Apart from higher education's obvious contribution to economic development in terms of producing the requisite skilled human resources

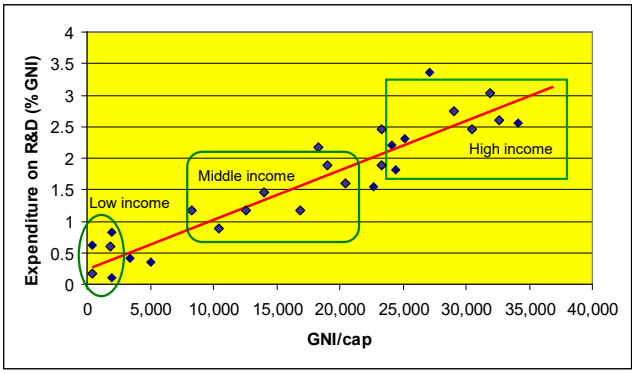
to drive development in key sectors of the economy, the role that higher education play in the area of scientific research and R&D work to support the development of products and services to fuel the economy cannot be underestimated

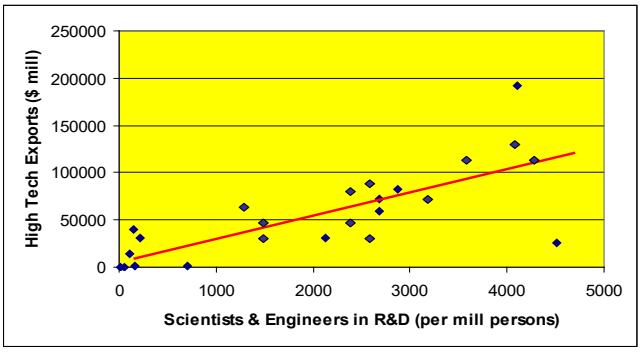
It could be established that the development of a modern information and knowledge economy (IKE) requires the development and the implementation of technologies in all sectors of the economy. Higher education is the main source of the knowledge workers as well as the source of the innovations to develop knowledge products and services to develop and drive the IKE. Other contributions of higher education to economic development can also be seen in areas like the role the universities play in the setting up of industrial and technology parks, which are incubating and facilitating the growth of new value-added knowledge-driven industries which are in the forefront of job and wealth creation in the major economies of the world. There is also the role now being played by the emerging entrepreneurial universities whose graduates are creating and running major new corporations which are no doubt contributing to economic development by generating jobs and massive wealth.

The Development of Africa's Higher Education in the Information and Knowledge age can only be achieved through addressing a number of the key challenges constraining its development: The argument being put forward is that the development of the higher education sector in Africa so as to effectively contribute to developmental goals (within the context of CESA 16-25) will require addressing some key challenges that are limiting the development of Africa HEIs. Some of the challenges include (i) *Inadequate funding to support key aspects of higher education development:* Most African countries are facing educational budgetary problems to fund and support its higher education systems. (ii) *The focus by higher education institutions on producing job-seekers other than job-creators*: Products from a number of the higher education institutions in a number of African countries are finding it difficult on the job market partly because of the low-graduate absorption capacity of the economies of these countries. As such a large proportion of the products of the higher education institutions educated at a high cost could not contribute to the nation's development efforts. (iii) *Lack of effective university-industry linkages:* Weak linkages with industry do give rise to situations whereby the higher education institutions fail to effectively take into account industry needs and the changing landscape and the human resource requirements of the economy in the technological age. This weak linkage with industry also translates into little or no funding support from industry to fund research, teaching and learning in HEIs - a factor that also inhibits their development and constrain their efforts to effectively contribute to economic development efforts.

The other identified challenges include (v) *Challenges of Integrating Technology into Higher Education:* A number of Africa HEIs are still grappling with the problem of introducing and deploying new and emerging educational technologies and systems to modernize their teaching, learning and administrative activities and processes. This is impacting negatively on the quality of their operations, and products. It is now not possible to deliver quality education and produce quality graduates to meet the needs of modern organizations and drive economic development without the deployment and the effective use of modern technology-driven teaching and learning methods and resources. (vi) *Limited and Weak Research and R&D Capacity:* Compared to their counterparts in other regions of the world, Africa's HEIs are not strong in producing critical-mass of scientific research and R&D outputs that could have an appreciable impact on industrial innovation and product development to fuel and support economic development to create jobs and wealth. Using data from a number of low income, middle income as well as high-income countries, research evidence shows that: there is a direct correlation between, the level of expenditure on R&D (as % of GNI) and the gross national income per capita of a given nation.

Fig. 1: R&D Expenditure, GNI/CAP & High Tech Exports





Also, evidence (above) drawn from a number of countries, using data from the World Bank World Development Indicators shows a link between the number of scientists and engineers involved in R&D (per million persons) and high-tech exports (in million dollars).

Concluding

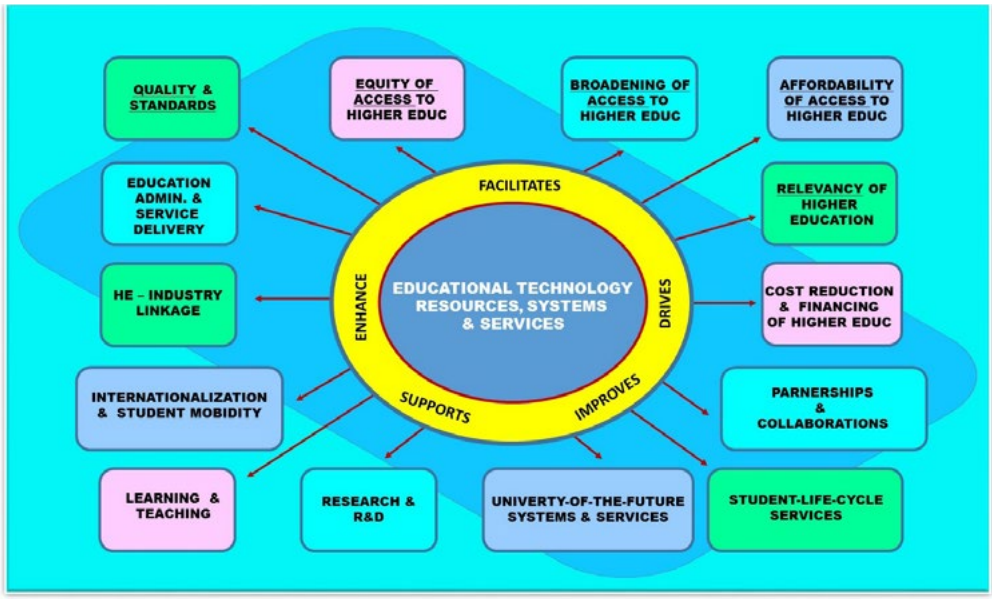
There is no doubt that a well-developed and strategically positioned Africa higher education sector in the emerging technological age can play a crucial role in contributing to the implementation of key aspects CESA 16-25 to serve as an effective change agent for the continent's sustainable development as envisioned by the AU's Agenda 2063. In this respect, Africa HEIs operating in a technology-enabled environment can serve as key players in addressing the developmental challenges that form the basis of the AU's Agenda 63 which the implementation of CESA 16-25 is designed to address.

2.0 THE TECHNOLOGY – HIGHER EDUCATION DELIVERY SPACE

It has been established that the relevance of technologies for supporting education and training at all levels of the educational system has now acquired new dimensions and greater urgency in a number of countries including those of Africa. The use of these technologies to support teaching, learning and the administration of the educational delivery processes and systems are fundamentally changing the educational delivery at all levels of the educational system in a number of countries.

Within the context of the implementation of CESA 16-25, these emerging educational technological resources, systems, and services, can be deployed by Africa HEIs, to drive the development of their institutions in the technological age and in the process facilitate the implementation of key CESA 16-25 initiatives including those directed at: ensuring *equitable* and *affordable access* to higher education; the *broadening of access* to higher education; enhancing the *quality* of educational programs, outputs and outcomes; ensuring the *relevancy* of higher education to support the development of the necessary industry-relevant human resources and skilled human capital to drive Africa's socio-economic development process in the technological age; promoting international partnerships and collaborations to facilitate the development of Africa's higher education; facilitating intra-Africa *mobility* of students; supporting *lifelong learning*; promoting *harmonization* of higher education systems and outcomes across various higher education regulatory systems; supporting research and R&D; and promoting effective education management and administration.

Fig. 2: The Technology-Higher Education Wheel



The *Technology-Higher Education Wheel* presented in Figure 2 above, illustrates how the deployment and exploitation of these emerging educational technological resources, systems and services can in a transformative way drive, support and facilitate various processes, practices, operations, activities and deliverables of Africa HEIs as well as address issues relating to the various technological offerings and systems; educational and technological standards; appropriate delivery and organizational structures and institutions; and regulatory issues in an effort to improve and enhance teaching, learning and research standards and outcomes of these institutions.

The deployment of suitable educational technologies and resources by Africa HEIs, can also support the delivery of technology-enabled student-life-cycle services; support the roll-out of various university-of-the future services; as well as support effective university administration and management, which will all contribute to among other things quality and standards of teaching, learning and educational outcomes within Africa HEIs as well as ensuring the relevancy of higher education to industry and development priorities and by so doing contribute not only to the development and the transformation of these institutions in the information, knowledge and the technological age but also to a large extent facilitate the realization of the aspirations and goals underlying the implementation of CESA 16-25.

Based on the details of the *Technology-Higher Education Wheel* illustrated above, the envisaged educational technologies and resources can also be rolled out by the Africa HEIs to support and contribute to their own development and in the process impact on the implementation of CESA 16-25 by targeting initiatives aimed at supporting: research and R&D activities, university-industry linkages; internationalization and student mobility; as well as international partnerships and collaborations.

3.0 TOWARDS THE IMPLEMENTATION OF CESA 16-25 IN THE TECHNOLOGY AGE: MAPPING THE ROLE OF AFRICA HEIs

Of CESA 16-25's twelve strategic objectives, the key ones relevant to the higher education sector include:

- To revitalize the teaching profession to ensure quality and relevance at all levels of education
- To build, rehabilitate, preserve education infrastructure and develop policies that ensure a permanent, healthy and conducive learning environment in all sub-sectors and for all, so as to expand access to quality education
- To harness the capacity of ICT to improve access, quality and management of education and training systems
- To strengthen the science and math curricula in youth training and disseminate scientific knowledge and culture in society
- To expand TVET opportunities at both secondary and tertiary levels and strengthen linkages between the world of work and education and training systems.
- To Revitalize and expand tertiary education, research, and innovation to address continental challenges and promote global competitiveness
- To build and enhance capacity for data collection, management, analysis, communication, and improve the management of the education system as well as the statistic tool, through capacity building for data collection, management, analysis, communication, and usage.

For each of these CESA 16-25 strategic objectives, specific targeted *actions and activities* were identified for implementation. We present in Table 1 below a suitable taxonomy that illustrates how the mainstreaming of the implementation some aspects of these envisaged CESA 16-25 actions and activities by Africa HEIs could be done through implementing some candidate *technology-enabled initiatives* supported by

the deployment and utilization of the emerging educational development and delivery technologies

Table 1: The Technology-Enabled CESA 16-25 Implementation Taxonomy

CESA 16-25 Strategic Objectives	Selected CESA 16-25 Envisage Targeted Strategic Actions & Activities	Candidate Technology-Enabled Initiatives to be Undertaken by Africa HEIs Towards the Implementation of CESA 16-25
To revitalize the teaching profession to ensure quality and relevance at all levels of education	Recruit, train, and deploy well-qualified teachers as well as promote their continuous professional development… Develop quality and relevant teaching and learning materials Enhance quality assurance and assessment mechanisms for learning outcomes Strengthen curricula to include life skills and other key competencies such as civics	National initiatives targeted at supporting the continuous professional development of teachers Initiatives by Africa HEIs targeted at the deployment of technologies to support activities aimed at improving quality and educational standards, as well as promote effective quality assurance and assessment in the development and delivery of education and training in the HEIs Initiatives by Africa HEIs aimed at the development of teaching and learning resources including the provision of e-library services and the deployment of Learning Management Systems (LMSs) to support modern education delivery services National initiatives to promote and enforce high standards in higher education provision and delivery to facilitate the development of globally competitive quality and professional manpower to support the development of information and knowledge-based economy and economy of various African countries National initiatives aimed at ensuring equity of access to higher educational resources and empowering learners through facilitating more active learning and learner participation in the learning process Initiatives aimed at supporting curriculum development and reforms; creative and innovative teaching and learning within Africa HEIs Africa HEIs to put in place and offer internationally benchmarked academic and professional programmes capable of producing internationally competitive, competent and highly skilled manpower and expertise that meets the demands of the modern economy

To build, rehabilitate, preserve education infrastructure and develop policies that ensure a permanent, healthy and conducive learning environment in all sub-sectors and for all, so as to expand access to quality education	Expand and consolidate infrastructure and learning and training facilities especially in rural and other underserved areas Formulate appropriate policies conducive to the expansion of education including tertiary education Address access constraints imposed by poverty, lifestyle, culture, location among others. Integrate mapping of education facilities and infrastructure into urban and rural planning	Initiatives targeted at rolling out and building requisite modern technology-enabled educational delivery infrastructure and facilities; communications and connectivity networks and platforms including targeting underserved areas to support teaching, learning, and research in Africa HEIs Continental initiatives aimed at deploying various educational technologies, resources, and systems to expand and broaden access to higher education and to ensure equity of access and affordability of access to higher education in African countries Special initiatives by Africa HEIs targeted making their academic and professional programmes affordable by the deployment of modern educational technologies to support their programme development and delivery and introducing cost-saving processes and systems into their administrative and academic management and delivery systems Initiatives targeted at the development and empowerment of Africa HEIs to enable them to position themselves to leverage on and take advantage of the predicted demographic dividend to meet the human resource requirements of the economies of African countries Continental initiatives by African higher education regulatory authorities targeted at regular and timely review and adapting of various higher education institutions, and regulatory frameworks, provisions, mechanisms, and structures to take into account of rapid changes and advances in the requirements and the demands of higher education provision and delivery Initiatives by national and regional higher education regulatory agencies to promote flexible regulatory regimes and provisions that adequately support the development of the higher education sector to meet the educational and economic development needs and priorities of African countries in the technological age National initiatives targeted at putting in place flexible and responsive higher education regulatory regimes that takes into account the rapid advances and the changing landscape of higher education provision globally; and the advances in the emerging technological opportunities to broaden access to higher education and promote and support the introduction of flexible learning modes to accommodate campus-based, ODL and blended mode delivery of academic programmes

To harness the capacity of ICT to improve access, quality and management of education and training systems	Formulate policies for ICT integration in education and training Build the ICT capacities of learners and teachers to take full advantage of the potentials of technologies Build capacities of education managers and administrators on the use of ICTs in the planning, implementation, monitoring, strategies, and programs Promote the development of online contents taking into account African and local specificities Capitalize on existing and successful ICT-driven initiatives that enhance access including the Pan-African E-University Provide appropriate and sufficient equipment facilities (e.g. connectivity, power) and services Create mobile and online education and training platforms and accessibility to all students regardless of their circumstances	Initiatives by Africa HEIs aimed at mainstreaming ICTs and other educational technologies into their respective higher education system to support all aspects of academic programme development and delivery Initiatives targeted at modernizing the capacity of Africa HEIs to improve quality and expand access to tertiary education, training and research resources and facilities Continental and national initiatives targeted at Africa HEIs and aimed at building the capacities of education managers and administrators on the use of ICTs in the planning, implementation, monitoring, strategies, and programs Initiatives targeted at the deployment of the emerging educational technologies and resources to support all aspects of education and training provision, research and R&D activities and academic administrative functions within the respective Africa HEIs Initiatives to implement projects aimed at the promotion adoption of e-learning technologies and educational delivery methods to enable Africa HEIs to progressively offer aspects of their programmes online to broaden access to higher education to a large section of the population and to maximize the quality and efficiency of learning processes, systems, and activities Initiatives targeted at promoting life-long learning initiatives to support on the job training, skills update, further and continuing education and learning Initiatives by Africa HEIs aimed at the deployment and utilization of appropriate educational technologies and systems to promote and ensure high academic standards in academic and professional programme development and delivery to facilitate the development of globally competitive quality skills, expertise, and professional manpower to support national development efforts

To strengthen the science and math curricula in youth training and disseminate scientific knowledge and culture in society	Encourage practical training and reward innovation and innovators Facilitate the implementation of incubator projects and mentorship programs Employ informal and non-formal means of disseminating scientific knowledge and culture Embed contextualized scientific knowledge in curricula and alternative delivery modes Promote indigenous scientific knowledge and culture	Initiatives by Africa HEIs target at taking verifiable steps to make them responsive to the training, human resource and the scientific research outputs needs and requirements for the development of their respective nation's information and knowledge-based economy and society National initiatives by Africa HEIs, national research R&D organizations aimed at organizing national STI expos to showcase innovations and R&D products and to recognize and award innovators Continental and national initiatives aimed at recognizing and promoting the use of indigenous scientific knowledge to support national development efforts in African countries
To expand TVET opportunities at both secondary and tertiary levels and strengthen linkages between the world of work and education and training systems.	Establish and strengthen Labor Market Information Systems to identify skills and competencies needs Build win-win partnerships between tertiary and vocational training institutions and enterprises to jointly develop and implement relevant curricula and programs Institutionalize internships as part of the preparation for the world of work Provide incentives for training institutions and private sectors involved in applying innovative solutions and promoting young entrepreneurs Promote entrepreneurship and innovation through incubation and research and development (R&D)	Initiatives by African Governments to promote national human resource planning to determine the human resource needs of their respective economies to ensure that the right types of skills, manpower, and professionals in the right numbers and mix are produced by HEIs and other training institutions Initiatives to promote and encourage the private sector in African countries to invest in national human resource development as well as to promote and support research and R&D initiatives targeted at Africa HEIs National initiatives aimed at broadening access to tertiary and pre-tertiary level TVET in key professional and skill areas Initiatives by Africa HEIs targeted at promoting relevant industrial and practical training and experience through university-industry linkage internship programmes Initiatives by various African Governments to periodically conduct a national human resource (demand-supply) gap study that will establish the human resource needs of the country across various skills and professions and based on this set enforceable quotas for human resource and skill development by the HEIs Initiatives targeted at ensuring the financial viability and sustainability of Africa HEIs in the climate of intense local and foreign competition for student enrollment

To Revitalize and expand tertiary education, research, and innovation to address continental challenges and promote global competitiveness	Create conducive environments for research and innovation through the provision of adequate infrastructure and resources Link research to the development of priority areas and enhancement of global competitiveness Promote research on education and TVET Consolidate and expand Centers of Excellence and enhance institutional linkages in the continent Promote international research and development cooperation based on continental interest and ownership Expand competitive grants and awards and other support mechanisms to nurture young academics and accomplished researchers Strengthen quality postgraduate and post-doctoral education to cater for expanding tertiary education as well as meet the demand for high-level human capital	Initiatives to support human capacity building in science, technology and innovation (STI), which hold the promise for enhanced national development in the technological age Continental and national initiatives aimed at developing Africa's STI capacity and capabilities and the building, upgrading and supporting of national innovation systems and infrastructure to meet international standards Special national projects targeted at promoting the building, upgrading and improving the research and the academic programme development, provision and delivery capacities and facilities of HEIs and research institutes to support national research and R&D and innovation efforts National initiatives targeting the modernization of TVET programmes to make them technology-complaint and relevant to the job and skills requirements of modern industry National initiatives aimed at promoting links between HEIs and industry through the implementation of various university-industry linkages Initiatives targeted at encouraging Africa HEI to enter into local and international collaboration and partnerships to facilitate educational and faculty exchange and research partnerships and collaborations
To build and enhance capacity for data collection, management, analysis, communication, and improve the management of education system as well as the statistic tool, through capacity building for data collection, management, analysis, communication, and usage	Establish regional and continental Education Management Information Systems (EMIS) and education observatories Identify and provide support to educational think tanks Support educational research, dissemination, and communication	Initiatives aimed at implementing, quality assurance standards, best practices, processes and procedures to improve key aspects of student academic life-cycle operations and activities Initiatives to develop in Africa HEIs, education management systems targeted at student and academic administration; programme development and delivery, research work, examinations administration; academic records keeping among others National initiatives aimed at developing the capacity of national educational think tanks and research institutes and organizations

4.0 CONCLUSIONS

The central thesis of this paper is that the emerging educational technologies, resources, and systems as discussed above, promises to disrupt and transform the educational delivery modes and activities of traditional university systems and that for Africa HEIs to play an effective role in promoting and supporting the implementation of the aspirations, goals and the initiatives of CESA 16-25, they must recognize and harness these modern educational technologies, resources, systems to support their teaching, learning and the administration of the educational delivery processes, systems, and operations. The case for the extended mandate of Africa HEI to support and drive key aspects of the socio-economic development of the continent in the information and technological age through the implementation of CESA 16-25 has been clearly established in the paper.

The implementation of CESA 16-25 by Africa HEIs notwithstanding, the argument is also advanced to the effect that, the deployment and the use of emerging educational technologies and resources to support higher education development, delivery and provision is crucial to ensure the relevancy and the survival of Africa HEIs in the emerging technological and information age. Thus it is argued will no doubt determine the extent to which they can deliver and provide access to relevant, equitable, quality and affordable higher education to the expanding working-age population so as to develop the needed critical human resources to drive the continents development agenda in the information, knowledge and technological age.

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Bridging The Digital Divide: The Role of Higher Education Institutions in Getting Africa Closer to the Global Information Society

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ABSTRACT

The information revolution of the 21 century has led to the creation of a new society called global information society (GIS). This review article intends to bring a superior understanding to the field of information and communication technology on the state of Africa's digital divide with the rest of the world as studied by different scholars. The evolvement of the global information society has led to better decision making process, increase of jobs, good governance, improved and increased commercial activities, promote learning and research, health care and the general standard of living. However, due to high level of digital divide between Africa countries and other nations of the world the global information society benefits are but mirages to the larger Africa society vis-à-vis higher educational institutions (HEIs) in Africa. Factors such as poor ICT policies, politics, poverty, and literacy are among challenges depriving Africa and her HEIs from the dividends of global information society. It is recommended that Africa's tertiary institutions can become a beacon of hope to address this ICT-technological gap by becoming an Oasis of IT, capacity building, ICT technological and human collaborations among institutions of higher learning, promotion of indigenous knowledge and local content, community contributions and development.

Key words: *Africa, Digital Divide, Global Information Society, ICT, Tertiary Institution*

1. GLOBAL INFORMATION SOCIETY: AN OVERVIEW

Global information society is a social request where the joining, supply, foundation, use and the management of information is a huge financial, political, and social activities. Its principal motivations are information and communication technology, which has led information to explosion and are incredibly changing all parts of societal arrangement, including the government, economy, health, training, warfare, and equity. The global information society (GIS) is a culture that halts every physical restriction and associates each individual all through the globe with the authority of information, intermediated by the internet. There is a contention around an accurate portrayal of information society, yet in by and large terms, it means a social request wherein the imaginative action, conveyance, appropriation, use, reconciliation, and control of information is a significant financial, political, and social gains. A society where the principle item or a necessity to different items is information. On a basic level, in information society, the specialists' productivities and associations' accomplishments hold tight on their capacity to utilize information. It is a spot which has the entrance and recognizes how to utilize: the ICT set-up, information resources and knowledge for the grip of group and individual objectives in a compelling and affordable way. GIS, can be a significant instrument in bringing individuals of all cultures and races all over the world, it is an asset that can breed common comprehension, delivering worldwide harmony and the security of the world. To build up a GIS, and achieve its real targets, the satisfactory assets and framework should be made accessible. Therefore, the Global Information Infrastructure (GII) was created to help the GIS which was to guarantee that each individual can approach the full advantages of the developments in information and communication technologies. The essential focus of the GII is to interface local, national, regional global network systems to promote a wide based social dialogue within and among all the nations of the world. GIS as foreseen, is to make a typical and more profound feeling of collective stewardship of planet earth, and that everybody ought to approach the worldwide vault and repository of information. However, this statement raises the inquiry: what makes the GIS an accomplishment for the Africa individuals and her higher education and institutions of learning, and what are the advantages of GIS to Africa as a network of individuals.

2. THE BENEFITS OF GLOBAL INFORMATION SOCIETY

The development of the information technology has brought about new methodologies and strategies through which human activities are conducted in capacities as never before (Goldfarb & Prime, 2008). This new society has a lot of economic development open doors for Africa and other developing nations. Hence, the advantages given by the GIS are endless however, for the sake of this paper they can be ordered as follows:

I. GIS Creates Digital Opportunities and Fosters Social Inclusion

Information Societies are only achievable if all individuals, including disadvantaged and marginalized groups (for example, persons with disabilities, indigenous peoples, individuals dwelling in extreme poverty), in addition, women and youths benefit correspondingly from ICTs for network empowerment, information distribution, generating knowledge resources and acquiring the skills necessary for life/study in the new digital environment (Hindman, 2000). GIS can lead to the actualization of ICTs as a way of authorizing local groups and help them fight poverty, marginalization and exclusion, particularly in Africa and the Least Developed Countries (LDCs). This can add to the dialog between citizens and public agencies as major participants of global information societies based on the sharing of information and the genuine participation of social groups at various degrees (Demoussis and Giannakopoulos, 2006).

II. Decision making

Gravili et al., (2018) concludes that GIS can expedite decision making process across organizations, cultures and backgrounds. Through this channel, provisions can be made available such that ICT accessibility by individuals to meet a need in a geographic location can cause a related adoption in cross culture. The global repository of information and knowledge occasioned by GIS now makes it possible for quicker knowledge transfer, which has enhanced the overall tone of the decision making process. The availability of information online has helped individuals or group of people to have easy access to information to solve a problem and take important decisions (Hindman, 2000).

III. Partnership for jobs

To make the GIS accessible to the masses, substructure in the form of service providers, software, hardware, and support staff will have to be rightly positioned. The demands

for these products and services has generated employment in these areas in order to satisfy the requirement. Growth in demand for computer hardware products globally has led to the world of opportunities for manufacturers, service providers etc., and also increase in demand for assemblers and support staff. Worldwide ICT inventions and ingenuities have resulted in the creation of job opportunities in high proportion such that in some places there is lack adequate manpower to satisfy the ever evolving global information society technology and revolution needs (Peters, 2012).

IV. Governance

According to Buys et al (2009), with wider links to information, the duties of governments will be more transparent. Electronic governance is targeted at increasing yield, reducing costs and empowering citizen welfare. Through GIS the citizens can engage in partnership with the leadership and gets feedback promptly rather than suffer the delay occasioned by bureaucratic bottlenecks; and also with GIS citizens can hold their leaders accountable for their actions.

V. Redefinition of Work Environment

Ogunmakin (2018) suggested that the Internet and its allied technologies have made the virtual workplace reachable by all. People can play anytime, anywhere, without being bound to a static workplace. Telecommuting, which is the usage of telecommunications technology for work, enables people to work non rigid hours from whatever placement in the universe. Flextime allows people freedom to arrange their time to enjoy more recreation leading in a less stressed, productive workforce. Physicians and nurses managing small rural clinics can log onto the Internet, type in a patient's symptoms, and approximately get advice and procedures for the discourse of the sickness. Authorized doctors could permission to telemedicine, which is an international database of patient records. This database will contain the whole medical account of patients. Thus, when a travelling patient falls ill in an overseas country, his/her records are punctually obtainable on the Internet. This will avert accidental deaths or difficulties by giving drugs or treatment that the patient is allergic to, or that may have side-effects with a patient's present treatment (Ogunmakin, 2018).

VI. E-commerce

A direct buy-product of GIS is e-commercialism. Electronic commerce or online shopping has taken the globe by storm. More people are depending on the Internet which has made it possible to remove physical boundaries and its systems are able

to gain new markets that were unachievable using traditional business methods. Organizations whose strategy is low cost producer technique are benefitting from the internet (Huvila, 2018). Societies around the globe are able to trim down costs using the Internet.

VII. Strengthening Capability for Research and innovation

The GIS ensures production and distribution of scientific, educational and cultural materials; and the preservation of the digital heritage as important elements of information companies. GIS also improves the networks of experts and of computer-generated interest groups, equally they are key to competent and active interactions and cooperation in information societies. Through ICT national research networks around the world has emerged therefore giving a facelift to research and improving its quality globally.

VIII. Improvements in learning opportunities

ICTs can contribute to raising the quality of instruction and studentship, through the sharing of information and knowledge. ICTs have the capacity to bring out into the educational progression a higher point of flexibility in response to the collective needs of African higher education establishments. The potential of ICTs to lessen the cost of education and to promote internal and external efficiencies of our education system should be grasped and fully exploited. Global information societies offer opportunities to use ICTs as innovative and experimental tools in the process of renewing education.

In addition, ICTs can be seen both as educational discipline and as instructive tools capable of growing the efficacy of educational services. A wide-based dialogue among all stakeholders and consensus should be established at local, national and international stages. This can generate strategies and policies for spreading access to teaching and learning, developing towards Education for All (EFA) targets at country level and renovating formal and non-formal education organizations (Shirazi, Gholami & Higón, 2009).

3. CHALLENGES OF THE GLOBAL INFORMATION SOCIETY

Although there are numerous challenges experienced in the global information society, Samelson (1999) gave a summary of the challenges as follows:

I. Hard to apply or adjust to existing laws and policies to the ruling of Internet activities, or whether new laws or policies are asked to control Internet behavior: The Internet is an ubiquitous computing environment and with design protocols that allow access to all from all places, as such formulating binding policies to regulate Internet activities across cultures of the world is challenging with a diversity of interests and complex social-ethnographic inclinations.

II. How to develop a fair and comparative answer when new regulation is needed: it is not only challenging to develop policies to regulate global internet usage, but the immediate reaction from stakeholders to such policies is another challenge confronting GIS in this twenty first century.

III. How to uphold fundamental human values in the fount of technological or economic pressures tending to subvert them; and

IV. How to establish with other nations in Internet law and policy creation so that there is a reliable legal environment on a worldwide base.

4. THE DIGITAL DIVIDE

The digital divide can be well-defined as the gap between people, businesses, households and geographic areas at different socioeconomic stages with respect both to their chances to access ICTs and to their economic consumption of the Internet for a wide variety of natural processes. The worldwide digital divide refers to differences between countries in terms of access to ICTs. Jin & Cheong (2008), asserts that ICT access inequality is addressed as the first order digital divide and ICT use inequality is called as the second order digital divide. The digital divide problem has demographic, geographic, and socioeconomic dimensions (Yuguchi, 2008).

Former US Assistant Secretary of Commerce for Telecommunication and Communication, Larry Irving, Jr. provided the term "digital divide" in the mid-1990s in a bid to focus public interests alongside the existing gap in link to information facilities between those who can afford to buy the computer hardware and software required to partake in the global information network, and low income families and communities who cannot have enough money to pay for it (Boje & Dragulanescu, 2003).

Wilson (2004) explains the digital divide as an inequity in access, supply, and usage of information and communication technologies between two or more populaces.

Wilson (2004), further opined that there are eight areas of the digital divide: production access, institutional access, physical access, financial access, content access, cognitive approach, design approach, and political approach. The digital divide refers to uneven patterns of capabilities of, material reachable to, usage, and benefits of computer-based information and communication technologies that are created by certain categorization processes that produce classes of the front-runners and failures of the information society, and participation in institutions governing ICTs and society (Fuchs & Horak, 2007).

Fuchs & Horak (2007) further states the types of access to ICTs as follows: usage and skill access is the competences required for operating ICT hardware and applications, material access is the accessibility of hardware, software, applications, networks, and the usability of ICT devices and applications; for producing meaningful online content, and for involving in online communication and cooperation; profit access means ICT usage that benefits the people and promotes a better society for everyone; institutional access is the participation of people in institutions that govern the Internet and ICTs, and the enablement of citizens by ICTs to partake in political information, communication, and decision procedures (Fuchs & Horak, 2007).

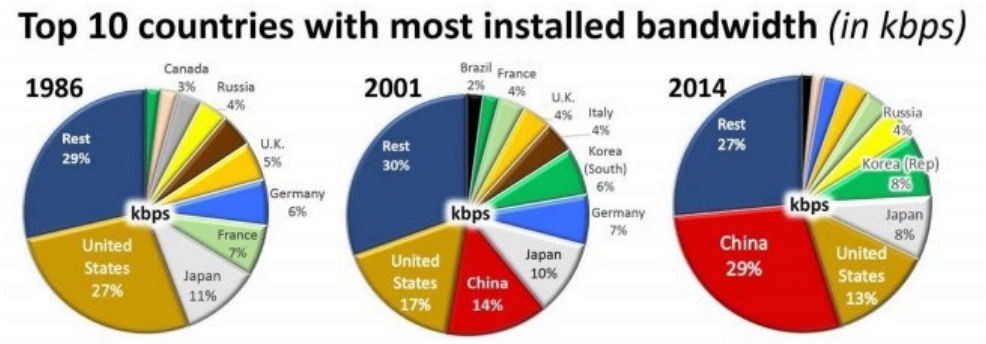
On the contrary, a US-based nonprofit organization, the National Digital Inclusion Alliance, has referenced the term "digital divide" to be challenging, since there is a variety of dividing. Instead, they chose to apply the term "digital inclusion", offering a definition: Digital Inclusion denotes the natural processes necessary to promise that all individuals and residential areas, including the most deprived, have access to and usage of Information and Communication Technologies (ICTs). This includes five elements: 1) internet-enabled devices that fit the demands of the user; 2) affordable, robust broadband internet service; 3) quality technical documentation 4) access to information and digital literacy training;; and 5) applications and online content intended to enable and encourage self-sufficiency, contribution and collaboration (Rouse, 2018).

5. THE GLOBAL DIGITAL DIVIDE

The universal digital divide describes global differences, primarily between developed and developing nations, in respects to access to computing and information assets such as the Internet and the projections derived from such access (Holloway, D., 2005). This gap defines an inequality that survives, referencing a global standard of dimension. The Internet is evolving very quickly, and not whole countries—principally developing countries—are able to keep up with the continuous modifications. The

term "digital divide" does not really imply that person does not have the tools; it could imply that there is only a difference in engineering science. These variances can refer to, for example, high-quality computers, fast Internet, technical help, or phone services. In 2014 only 3 countries (China, US, Japan) host 50% of the global connected bandwidth potential. This focus is not novel, as historically only 10 countries have hosted 70–75% of the global telecommunication capacity. The U.S. lost its universal leadership (see fig. 1) in terms of connected bandwidth in 2011, being supplanted by China, which hosts more than twice as many national bandwidth potential in 2014 (29% versus 13% of the global total).

Figure 1: Top 10 countries with most installed bandwith (in kbs)



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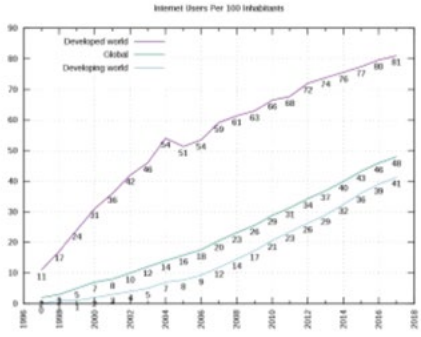

Figure 2: Internet users per 100 inhabitants (1996-2018)
Source: International Telecommunications Union.

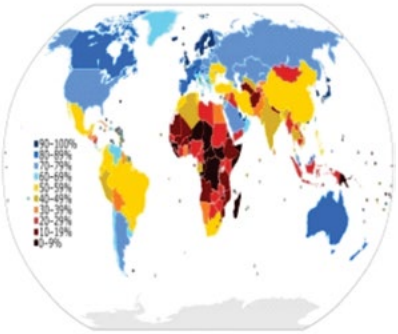

Figure 3: Internet Penetration World Map
(Internet users in 2015 as a percentage of country's population)
Source: International Telecommunications Union.

6. FACTORS ASSOCIATED WITH DIGITAL DIVIDE

I. **Gender:** In some nations and organizations, females have less access to the Internet than males. The research by (Gillwald, 2017) results are hard-hitting in that they demonstrate the gender digital divide to be a rough reality in each one of these countries, especially in terms of control, content and capacities. Only young girls with a secondary school education seem exempt from these gender disparities.

II. **Physical disability:** Fuchs & Horak (2008) suggests that disability also creates an information have and have-not situation. Visually impaired and blind persons are now fully capable of utilizing a computer due to advances in engineering such as Jaws, which is one of many screen readers. Screen readers are voice synthesizers that can scan the textbook on a sieve. The Internet, however, is distant to the blind and visually impaired user, because the blind reader is unable to understand the graphic based Web page.

III. **Racial segregation:** According to a study by Novak and Hoffman (1998), African Americans differs significantly from whites in their access to data processors and Web use. The survey discovered that 44% of white Americans had home PCs, whereas just 29% of blacks had home PCs. This determined the access that blacks had to the Internet.

IV. **Age:** Digital divide exists between age groups because the young are more exposed to applied science and are willing to apply it, whereas, older people are laggard to change and avoid the usage of applied science (Aaron, 2014).

V. Poverty & Poor Infrastructure

Poverty is the center part in the digital partition. Akanbi and Akanbi (2012) opined that in a universe where the rich become fatter and the poor get less fortunate; the developing nations surely are not able to increase adequate subsidizing to buy the media transmission foundation and hardware. Or maybe, they are increasingly worried about wellbeing support and other social framework, for example, water and power. Likewise, the immature media transmission foundation has restricted their ICT accessibility and therefore data denied (Akanbi and Akanbi, 2012).0

V. **Corruption & Bureaucracy**
Any nation of the world with corrupt leadership will suffer from economy down turn unless otherwise there is prompt intervention (Van Dijk and Hacker, 2003). Without transparency and effective leadership it will be difficult for Africa nations to experience developmental strides in ICT. Since ICT infrastructures are capital intensive it will require strong political will and honest government to aggressively invest in ICT sector but if this is not the case such nations will be wide apart in ICT. More so, unnecessary bureaucracy by a nation's leadership can hamper it ICT growth. Where issuance of license to ICT companies involves unnecessary bottleneck other neighboring nations with similar market environment can lure such companies. For example, in the case of clearance of goods in some Nigerian seaports involves processes and time that shippers are not willing to negotiate and as such, some shippers now take their goods through some neighboring seaports which has brought economic growth for those nations.

VII. Lack of Educational Exposure & Technical Support
Providing training in ICT is a major challenge in light of the fact that ICT is costly and subsidize debilitating. With the framework beforehand in a desolate state, floods in electrical links can harm equipment as well as low data transmission association confines the Internet get to without question. In increment, absence of master backing to introduce the frameworks and fix the gear can be risky and problematic. Especially with the absence of specialized skill, people are frequently without heading and little learning with innovation about how to utilize the current hardware and coordinate into the course of study. In this way, researchers are not ready to have adequate innovative aptitudes (Atici, 2010).

In considering other factors Enoch & Soker, (2006) that submit that the following are also critical in influencing digital divide:

VIII. Income inequality is an effect
Family or individual income has been illustrious as an important determinant of the presence of information processing systems and the internet diffusion in households. Income delivery is especially critical in the dispersion of new manufacturing science; with higher income groups easy to acquire ICTs infrastructure earlier.

Rurality
IX. As urban centers are progressively building high-speed broadband networks, many rural and outside areas are ignored because the price and trouble associated with wiring the rural locations are much expensive and prohibitive.

IX. Illiteracy

Ability to access to technology and content are insufficient. With ability to access to internet, the individual have to understand minimally

1) How to use the technology
2) How to research and retrieve relevant data via the Web
3) Process the data in order to answer their information problem and needs

Genus & Nor, (2007), suggested that people should not only have the accessibility to the Internet, but the knowledge to use the Internet.

X. Language barriers and lack of local cultural diversity

The greater part of the sites accessible are commanded by English while sites with nearby voice interchanges are uncommon. A few people, especially the individuals English's identity not their local language may experience breaking points and unfit to contribute completely utilizing the English language. In addition, low accessibility of neighborhood and social issues and web substance that are adequately advanced with social decent variety likewise added to the computerized partition in Africa. Nearby clients are denied from getting to neighborhood data and administrations as required here in Africa. Figure 4 and 5 beneath demonstrate the predominance of English language in web substance and strength of English and Chinese web clients.

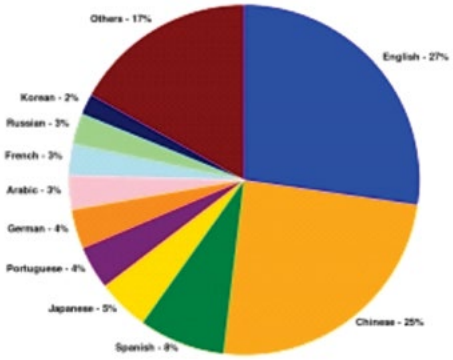

Figure 4: Websites By Language Pie Chart
Source: International Telecommunications Union.

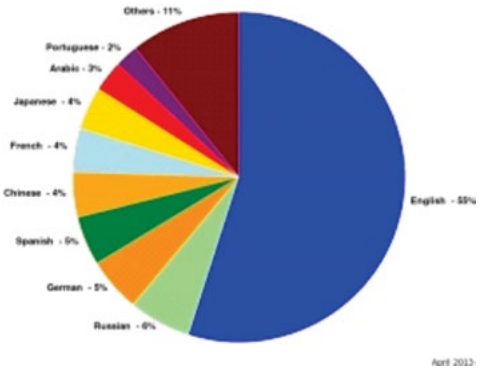

Figure 5: Internet Users By Language Pie Chart
Source: International Telecommunications Union.

7. REVIEW OF AFRICA'S HIGHER EDUCATION AND INSTITUTION INTERNATIONAL CONNECTIVITY

Ogunmakin, (2018) opined that Education, cutting-edge research, technology and science are essential ingredients of a sustainable economic and social development. Establishing a sound education and research community is the foundation for society development, equity, prosperity, stability and regional integration. It is also the lifeline towards bringing Africa closer to the rest of the world in terms of the global information society. Nevertheless, the pace and quality at which contemporary knowledge and education is delivered and research carried out have become increasingly dependent on the use of ICT, and in particular, on high speed Internet connectivity. Education, research, and ICT are mutually inclusive, it is impossible to develop an economy driven by knowledge and organize research to provide solutions to demanding economic and social problem in Africa, without good international connectivity. As a matter of fact, academic and research networking are now regarded as basic national infrastructure just like water, roads and energy services because of its impacts on learning, teaching, research and other scientific involvements that will have positive effects on the whole general economic development and social structure. However, education and research community in Africa's HEI have been marginalized in this process due to lack of necessary infrastructure. Based on this premise Africa's HEI remain a beacon of hope towards ensuring that the current ICT divide that exist within Africa nations and between Africa and the rest of the world is drastically reduced to the barest minimum.

The presence of NRENs in Africa has brought about the development of research and education in Africa's higher institutions but participation from some member states is still at a snail's speed. The nonappearance of advancement in such nations does not basically reflect absence of consideration among the end client partners. Collaboration among pioneers inside the ICT interest group in higher institutions is basic in many nations. As IT experts occupied with acquiring Internet access for their scholarly associates, they already comprehend the requirement for an NREN and the propelled administrations it can give far beyond straightforward Internet access. Their test is to impact their institutional administration and, thusly, their legislatures, of the requirement for a committed system that can answer to the unique needs of scientists, lecturers, and students, and this is undeniably more multifaceted issue than just giving Internet access. Perhaps the best test looked by these pioneers and champions is the absence of mindfulness and political will among leaders of how the

Internet functions and what value added an NREN can bring to advanced education. While subsidizing is additionally a test that is essential to assist advancement in certain nations, however, due cognizance must be given to ICT in the development of research and education.

There are different problems in some African countries which include the late arrival of fiber infrastructure, the conservative attitudes within incumbent Telecommunication companies, and, where telecoms are liberalized, the very forceful rivalry from ISPs who see NRENs as plundering on their customer base. In other cases preliminary work is well advanced but an injection of funding is obligatory to realize the plans. Although, most Africa's HEIs are still distant apart from their global counterparts in terms of bandwidths and provision of ICT support services, their achievements so far with the support of the different stakeholders are a good point for higher education and institutions in Africa to play a pivotal role in bridging the digital divide that currently exists between Africa and the rest of the world.

Consequently, Africa's HEIs can take the driver's seat in pioneering bridging the digital divide in Africa through the following **recommendations**:

1. The production of culture of innovation must be created in institutions, and Scholastics need to engage themselves so as to give administration to their understudies to go with the same pattern. In the event that scholarly pioneers are utilizing innovation, their understudies will receive innovation also.

2. Disposal of obsolete innovation and give all staff Internet able PCs.

3. For teachers to give innovative initiative, they must be outfitted with the most recent innovation. Teachers can utilize the Internet for research and can instill similar qualities among their understudies by alluding them to profitable Web destinations.

4. Provide training for all staff. Colleges need to build up the aptitudes of their workers.

5. Competent, gifted staff can give sure technological authority to their understudies.

6. Introduce PC proficiency and Web-based research over all resources. More research facilities should be assembled and prepared to give registering

aptitudes to understudies from all resources and controls. All understudies must be capable in utilizing a working framework, a word processor, spreadsheet, introduction programming, database programming, a Web program and email. Far beyond showing the utilization of a Web program, understudies must be shown seek abilities, so as to utilize the Internet all the more viably.

7. Develop an e-learning society where speakers post notes and connections on their customized Web locales. On the off chance that course work is exhibited on the web, understudies will be compelled to utilize the Internet with a reason instead of surfing heedlessly when they have spare time.

8. Develop an e-look into culture where understudies are educated and urged to utilize the Internet for research purposes. The Internet is a universe of learning that grows one's information skylines. Understudies should be acquainted with the different online library assets, for example, Ebscohost and Sabinet.

9. Make offices accessible 24 hours per day, on the ends of the week and amid harvest time and winter get-aways. At most colleges, PC offices are underutilized night-time and amid occasions because of the likelihood of security dangers. Colleges need to give twilight security all together that understudies approach the offices.

10. ICT technological and human collaborations among institutions of higher learning: Promote the adoption of ICTs in teaching, learning, and research. This would include provision of adequate budget for faculty training in content development and facilitation to enable students and faculty acquire digital equipment and software to access Internet resources.

11. Promotion of indigenous knowledge and local content: A greater part of the Internet language is English language. How does this benefit Africans that are not literate in English language? Africa's HEIs can engage in the promotion and propagation of indigenous knowledge in our curricular. This will go a long way to provide an in-depth understanding of digital literacy vis-à-vis the enhancement of ICT. More so, the information content in any device is an embedded currency that adds value to the language in the device. Rather than promoting and importing content from different parts of the world, HEIs can participate in building information content that reveal the true potentials and developmental strides of the Africa communities.

12. Community Contributions and Development: HEIs in Africa can become frontiers of advocating ICT community contributions through community services events and others. Self-less service in creating ICT education and training to areas and persons in need of ICT services such as organizing information literacy programmes to primary and secondary schools students.

13. Gender equity: HEIs can encourage more female participation in the ICT community by reducing the standards with minimal difference and provisions of scholarships for females who are willing to take up careers in our higher education and institutions of learning.

    Children: One Laptop per Child (OLPC) initiative was an attempt to narrow the digital divide. The organization, founded in 2005, provides economically made "XO" laptops (called the "$100 laptop", though actual production costs vary) to children residing in poor and isolated regions within developing countries. Each laptop belongs to an individual child and provides a gateway to digital learning and Internet access. In support of such initiatives Africa's HEIs can engage in the process of training students of education faculties with the required information literacy so that during their internship such knowledge on ICT will be transferred to the children.

14. The concept of rurality: Rural communities in Africa constitute a larger proportion of the general population. Africa's HEIs can invest in research that will produce low energy consuming ICT devices and also broaden the scope of researching ICT devices that are rugged and can deliver the required ICT services in such rural communities.

CONCLUSION

The reviewed items indicate that bridging the digital divide in Africa is a feasible project. The feasibility of this process requires concerted efforts from all the stakeholders in Africa. But more importantly in the sincerity of purpose and political will of African leaders and leadership at all spheres. The achievements made by African countries in the Mediterranean region, and in Sub-Saharan regions are a good point to consolidate. We must begin to build African technology in Africa to serve us and the rest of the world.

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Enhancing Mobility through Benchmarking Professionalization Schemes at the University of Bamenda, Cameroon

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ABSTRACT

The perception that African youths crave for opportunities only outside the continent is fraught with untested and unproven paradigms as intra-African mobility of academics and students can unravel opportunities heretofore considered unattainable. In this contribution we share experiences from The University of Bamenda's professionalization strategy and its quality assurance indicators that have the capacity to propagate staff and student mobility. Here we elaborate on seven pillars of professionalization to attract students and staff from within and without the continent and provide outcomes that can be evaluated. This requires a re-alignment of academic programmes to elucidate the role of providing entrepreneurial skills to graduates. Here indicators such as proper evaluation of field/industrial training activities so that students earn credits for them, flexibility on entry levels for students with specific previous technical qualifications plus work experience and assigning credits to such skills and the interaction with Learned Societies to participate in training programmes are presented. We demonstrate that this professionalization strategy can attract both trainers and trainees (mobility) as the desire to produce

graduates with succinct learning outcomes is paramount and essential for the emergence of 'The Africa We want' as enshrined in the CESA 16-25 concept.

Keywords: *Africa, entrepreneurial, credits, mobility, professionalization*

INTRODUCTION

As it is the case with most sub-Saharan African countries, Cameroon faces a near lethal youth unemployment largely due to the 'youth bulge' on the continent. Yet Cameroon seeks to become an emerging economy by 2035 and it has elaborated a detailed Growth and Economic Strategy Paper (GESP) to guide this emergence process. The success of the GESP schemes which are perceptibly linked to the Sustainable Development Goals (SDGs) lies in developing a higher education sector that places in its graduates the capacity to conceive, create, adapt and innovate. This requires an attractive and result-oriented higher education set up with deliverables that can be measured as quality assurance indicators. In this chapter we present the strategy at The University of Bamenda (UBa) to promote mobility through progressive professionalization of the University's training programmes. The seven targets in this strategy include: to produce graduates with adequate skills (employability), produce graduates capable of being entrepreneurs, add value to theoretical training to serve the 'soft economy' or knowledge-based economy, encourage and consolidate public-private sector partnerships (PPP), enhance multi-stakeholder involvement in mobilizing and sharing knowledge and technology, enhance student mobility and credit transfer schemes and staff development programmes. We provide milestones and verifiable indicators for each target/activity such as the support provided to trainers to exploit networks to refresh their knowledge and acquire new skills, building staff capacity through workshops and seminars in order to raise their output, enhance staff development through grants and staff mobility often with industry partners, and align all training programmes to the *Bologna process* termed nationally as the Bachelor-Master-Doctorate (BMD) framework. In the subsequent sections each of these themes is expatiated on in the light of current practices and expectations at UBa.

In this contribution we explain the various actions taken at UBa to enhance mobility through progressive professionalization of UBa's training programmes. The potential indicators to be used to evaluate the success of these actions are stated and discussed. The principal objective is to share these experiences with other institutions in a bid to contribute to training that produces graduates with adequate skills to move the continent forward.

PRINCIPAL MOBILITY ENHANCING ACTIONS AT THE UNIVERSITY OF BAMENDA

The seven thematic pillars (hereafter referred to as 'Targets') designed to benchmark mobility and professionalization schemes at UBa are discussed in this section.

TARGET 1: PRODUCE GRADUATES WITH ADEQUATE SKILLS: EMPLOYABILITY

To be able to confront the development challenges of the continent, graduates should have adequate problem solving skills. The UBa in this respect has developed a number of professional training programmes with over 50% content based on field training or skills acquisition in the work environment. For example, UBa's Transport and Logistics degree programmes are designed such that students are trained through a series of internships in companies in addition to on campus regular classroom learning. The internship office of the discipline involved at the level of the University defines the expected outcomes in concert with the company before the students commence. These internships are guided by a well-developed curriculum such that the activities of the student directly translate into credits earned on the degree programme. Performance indicators already developed and tested for this target include systematic follow-up of internship programmes by specialized personnel of the University, a standardized internship guide book for each discipline, and the evaluation of skills gained by the student upon the termination of each internship. Similar indicators have been evaluated by Anderson (2002) in a drive to reform the teaching of science at the tertiary level of education. In the long run, it is envisaged that certain disciplines should also evaluate previous industrial skills acquired by the student before admission into the University. This will facilitate the switch and from classroom to industry and from the factory floor back to the classroom. The success of these activities lies largely in the enhanced functionality of the Service for Internships in all Establishments at The UBa.

TARGET 2: PRODUCE GRADUATES CAPABLE OF BEING ENTREPRENEURS

At the UBa the curriculum for a number of disciplines has been expanded to include entrepreneurship courses in partnership with industry. For example, in the School of Engineering and College of Technology, enhanced contents with desk top experimentation simulating industrial scenarios is part of the curriculum. Also the University has supported the development of Technology Incubators and Junior

Enterprises schemes to enable the students understand how to set up enterprises upon graduation. The College of Technology's Agribusiness schemes and demonstration farms are good examples. Also at the Faculty of Science a professional programme in Biology includes honey harvesting and its subsequent processing to enhance certain health-related properties. The University takes a keen interest in financing student micro-projects a few of which have come to fruition such as the Automatic Class Attendance Software project developed by computer science students. Performance indicators here include the number of student projects that win national recognition each year and the rate of converting the projects into real businesses. This year three of The UBa student Technology Incubator projects won gold medals at the national level. The University of Bamenda also won the Presidential Award for the most successful student Technology Incubator projects. The University plans to use these national recognitions to leverage its engagement with the Global Entrepreneurship Network and work to increasing student startups as explored by McMurtrie (2015).

TARGET 3: ADD VALUE TO THEORETICAL TRAINING TO SERVE 'SOFT ECONOMY' (CLASSICAL FACULTIES)

The Faculties of Arts, Science, and Humanities are labelled by the Cameroon Higher education sector as 'Classical Faculties' and there is a national agenda to move these Faculties towards progressive professionalization. Providing sufficient theoretical framework during training in these Faculties allows students fit into the knowledge-based economy upon graduation. At the University of Bamenda the Faculty of Arts, for example, has developed a Performing and Visual Arts degree programme. Students admitted into this degree programme complete a series of courses through immersion schemes in the industry for which they earn credits. Efforts are underway to admit students who have spent a lot of time in the film, documentary, theatre, etc industry and wish to return to the University to complete a degree. Such students should have their work experience evaluated and accorded credits such that they do not have to take the same courses as students coming straight from secondary schools into the programme. Such shifts in training strategies have been demonstrated elsewhere to be extremely beneficial (Caro *et al.*, 2016).

The University has also developed hybrid degree programmes between the Classical Faculties and the technology-based Establishments. A typical example is the Health Economics degree programme developed by the Faculty of Economics and Management Sciences and the Faculty of Health Sciences. Students on this programme are grounded in the theoretical knowledge from an economics perspective with direct application to health and medical enterprises. This postgraduate programme admits

students from diverse academic backgrounds and permits mobility across disciplines. The success of these schemes is systematically evaluated through the rate at which students gain employment upon graduation, the number of students admitted into joint degree (hybrid) programmes, the foreign student proportion, and the number of employed persons returning to enroll into these programmes and seeking to earn credits from their previous work experiences.

TARGET 4: ENCOURAGE AND CONSOLIDATE PUBLIC-PRIVATE SECTOR PARTNERSHIPS (PPP)

The CESA 16-25 concept has outcomes that can be achieved mainly if Universities on the continent orientate training programmes to resolve real life problems and surmount the development challenges of the continent. Where such programmes exist, students are likely to move from one institution to another across countries sharing experiences and finding common solutions. Such training programmes are best developed in consultation with stakeholders such as the public and private sector who have a better grasps of what the skills needs of the society are. This grass roots approach, alternatively termed 'Citizen Science' (Haklay, 2012) allows the community to engage with the University in working toward solutions and thereby influencing the evolution and attractiveness of its training programmes. At The University of Bamenda, a number of task-specific partnerships have been signed with the private sector. For example, the Institute of Transport and Logistics has partnership agreements for training with the Cameroon Customs as well as the Douala Port Authority. These institutions participate in syllabus reviews, field supervision of students and encourage student mobility within the CEMAC zone. They also support staff exchange programmes and offer on-site refresher courses for University teachers. This opportunity is open to University lecturers from other African countries as long as their Universities enter into a partnership agreement with The UBa to foster intra-African staff and student mobility.

The performance indicators here include the number of foreign students UBa can attract each academic year especially from countries in the CEMAC sub-region, number of Lecturers returning to industry for hands-on training, the transferability of credits to other Universities for students who do not wish to graduate from the UBa but wish to participate in these schemes.

The PPP initiatives also assist in mobilizing private sector funding through consultancy services. The partners also support the construction of research and teaching laboratories on campus. For example, the University of Bamenda Development Fund

(UBaDEF) is presently completing the construction of a pedagogic (classrooms and laboratories) block on campus.

TARGET 5: ENHANCE MULTI-STAKEHOLDER INVOLVEMENT IN MOBILIZING AND SHARING KNOWLEDGE AND TECHNOLOGY

A significant deterrent to student and staff mobility on the continent is the persistence of 'traditional classroom' settings in the teaching and learning process. Many Universities are still tied to having students spend the entire semester in the classroom oblivious to the alternative learning methods made available with the developments in information and communication technologies (ICTs) (see Hattie, 2009, for example). The University of Bamenda seeks to increase ICT-based training and course content delivery to offer its students flexibility in participation. This project is still in its infancy but the optic fibre network across campus has been developed and public funds allocated for the construction of a modern ICT Centre.

The vision of the UBa is to partner with stakeholders to allow its students follow courses and demonstrations online. For example, engineering students can be exposed to an industrial activity in real time by linking up students on campus to activities in the factory. Also medical students should be able to follow certain procedures from partner hospitals in real time. The benefits of these collaborative schemes are enormous. For example, knowledge already available in the manufacturing process can be shared with engineers in training without having to develop new curriculum at the university to address certain needs. Such content is allocated relevant credit values, shared online and evaluated periodically by the professional bodies such as Cameroon Society of Engineers.

The number of degree programmes at The UBa participating in such distance education schemes as well as rate of student mobility taking advantage of ICTs are useful assessment indicators for the performance of these schemes. Also the number of massive open online courses (MOOC) and collaborative online international learning (COIL) plans that come on stream each year is a useful milestone.

TARGET 6: ENHANCE STUDENT MOBILITY AND CREDIT TRANSFER SCHEMES

The new higher education vision to which Cameroon adheres requires that training should be learner-centered. Consequently the credit value for any course is dictated by

the number of outcomes that the learner aims to achieve after taking the course. This concept, built in the *Bologna process*, facilitates the comparability and transferability of credits. Cameroon has adopted the Africa Quality Rating Mechanism (AQRM) and The UBa has aligned all its courses and associated credits to the Bachelor-Master-Doctorate (BMD) framework. This has increased the number of students from other Institutions and neighboring countries taking courses at The UBa since the credit systems are harmonized to a national and international framework. Each credit is broken down into outcomes that include both intellectual growth on the part of the student and the evaluation of field/industrial/practical training skills.

Ensuring that all programmes in the University has the relevant course-credit system is a key performance indicator in this regard. Identifying which courses attract the most students from other Universities is also useful to the design of metrics to evaluate and enhance the data that support the University's reputation and standing.

TARGET 7: STAFF DEVELOPMENT PROGRAMMES

Shifting the paradigm from a traditional intrinsic University to that which seeks to attract foreign staff and students requires that academic staff have the requisite knowledge. The University of Bamenda provides support to trainers to exploit networks and refresh their knowledge while acquiring new skills and this is a vital aspect in preparing trainers as discussed by Cairns (2019). This is done by building staff capacity through workshops and seminars at level of the Establishments in order to raise staff output. Also the University enhances staff development through grants, staff mobility, fellowships and seminars often with industry and other partner Universities in Cameroon and abroad.

The attractiveness of the university to foreign students and staff depends a lot on its research and collaboration programmes. The University of Bamenda has its research and international office combined into one service. This 'one stop' is advantageous in seeking collaboration and sharing information on important grant and mobility schemes. Indeed this approach has been demonstrated to work well in enhancing mobility and globalizing programmes in many University across the world (see examples in Holbrook and Caruson, 2017). These international partnerships for both staff and students are regularly assessed and their productivity and contribution to teaching and research activities documented.

The University is developing an instrument with data-driven indicators to evaluate existing collaborations, areas where amendments are needed as well as areas in which

new engagement frameworks have to be established. Staff training needs to fit into the new trends in higher education and university systems are also compiled regularly. The EU's Erasmus Mundus programmes have been exploited by the Faculty of Science and College of Technology staff and students through partnership agreements with The UBa and European Universities.

ASSESSING MOBILITY BUILT AROUND PROFESSIONALIZATION AT THE UBa

Universities are increasing receiving scrutiny from governments, funding agencies, industry and the general public. Consequently the success of each programme such as mobility and professionalization schemes must be based on robust data. Instruments to guide the data collection process must be established. At the University of Bamenda the following mechanisms have been put in place to facilitate this process:

1. The University has set milestones and verifiable indicators for the activities placed under each of the Targets described above. These are contained in UBa's functional and amendable teaching and research road map (called The University of Bamenda Strategic Plan: Teaching & Research 2017-2023) with clear plans that guide every step or activity.

2. Enhance quality assurance mechanisms both in teaching, research and industrial training. The University adheres to the minimum standards established by the regulatory government entity. It also has an auto-evaluation tool aimed at assessing progress and identifying gaps requiring more impetus.

3. The Directorate of Academic Affairs keeps track of all staff and student mobility while the Central measures the annual use of e-resources through the Library and UBa's IT Centre. These metrics are useful in evaluating success in the domain of flexibility of credit transfer and distance education.

4. The University is also open to independent periodic assessment of its various activities and curriculum by Professional Bodies such as the Cameroon Medical Council. Careful instruments to gather the contributions of these PPP initiated are still being developed.

The professionalization and mobility ambitions of The University of Bamenda are constrained by limited financial resources that hampers smooth implementation of some of its training schemes. Also the shortage of permanent teaching staff in some technical disciplines implies reliance on part-time teachers and this is expensive

and not good for quality follow-up. The University is making efforts to transform this weakness into an opportunity for attracting foreign staff on short term basis. At national level legislative intervention might be required to enforce private sector participation in training at higher education institutions.

RECOMMENDATIONS AND CONCLUDING REMARKS

The University of Bamenda is committed to enhancing staff and student mobility. It seeks to attain this objective by professionalizing its training schemes and defining targets with specific activities that would render the university more attractive, competitive and relevant to national and regional development. The success of this plan depends on attaining clearly defined benchmarks which are presented in this chapter. These can then be periodically measured and reported for wide visibility and contributions. Policies exist at the university to encourage staff participation in these schemes and increase communication between policy makes, teachers, students and partners. It is recommended that the success of these actions be periodically assessed and any new ideas that may henceforth emanate from the experiences of other institutions on the continent be incorporated. The activities under these themes must therefore remain dynamic and open to periodic revision and upgrade.

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Harmonisation of Higher Education: Internationalisation Focus

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ABSTRACT

Harmonization of higher education addresses challenges associated with intra- and inter-country variability in quality delivery of higher education institutions. The journey towards a harmonized, inclusive African higher education space may remain elusive if individual nations fail to observe that "charity begins at home." This entails nations first making their education systems transparent and integrated as a precedent to sub-regional and regional harmonization efforts. Leveraging on the affordances of the self-study methodology, the paper showcases the process of harmonizing higher education undertaken by one quality assurance agency to assure quality in a constantly changing higher education environment. This case serves as a real-life example that provides a context for understanding the complexities, processes and positive impacts of harmonization activities. Due to the multifaceted nature of harmonization, the paper focuses only on providing information regarding the development of a common policy framework for higher education as a record and resource for countries still developing quality assurance frameworks. The paper concludes by highlighting critical learning points by way of recommending best practice.

Keywords: *Harmonization, higher education institutions, internationalization of higher education, quality assurance, common policy frameworks*

INTRODUCTION

Africa boasts of several initiatives towards harmonizing higher education (HE) to enhance mobility and strengthen integration at the continental, sub-regional and national levels (Woldegiorgis, Jonck, & Goujon, 2015; Knight & Woldegiorgis, 2017). Harmonization is a multi-dimensional stakeholder-driven process that integrates HE systems to bring about convergence, comparability and consistency to enable mobility (Hahn & Teferra, 2013). In HE, harmonization is an umbrella term that incorporates many facets inclusive of: common credit accumulation and transfer systems; minimum bodies of knowledge (MBKs) for study programmes; common frameworks for staff grading and promotion; common quality assurance standards for HEIs with respect to qualifications, examinations, research, governance, etc.; higher education management information systems, common frameworks for the internationalization of higher education (IHE). The focus of this paper is on developing a common national framework for IHE as a precursor to possible regional frameworks.

IHE is a critical tool in empowering HEIs to contribute towards the attainment of national development goals. It enables HEIs to produce competent graduates that are able to develop themselves and their societies. Such graduates are expected to possess a broader worldview that makes them attractive to local and global employers (Mansilla & Jackson, 2013). Further, they are empowered to challenge inequity, injustice and contribute to sustainable socio-economic and ecological development. IHE enriches the students' learning experience to improve their employability through strategies such as mobility, curriculum modification, networks, collaboration and partnerships (Sheppard & Bellis, 2008). Accordingly, in the globalization era, a key measure of a university's success and competitiveness locally and globally is its ability to internationalize.

Serious engagement, debate and research regarding the discourse of IHE emerged in the 1990s. IHE is considered inseparable from the discourses and practices of globalization (Marginson & Rhoades, 2002; Stromquist, 2007; De Wit & Hunter, 2015). Be that may, the distinctive aspect of IHE is that it is invariably situated within national contexts, and usually at the nexus between multiple national systems and regulatory frameworks (Kaur et al., 2008; Rezaei et al. 2018). The motivations of IHE include embedding interculturalism; global citizenship, positional advantage to be gained from an 'international' degree (Stromquist, 2007; Knight, 2015, De Wit & Hunter, 2015) within the national, cultural and socio-economic context. Scholars agree that IHE is highly complex as evidenced by the diversity in understandings,

strategies and activities across HEIs resulting from the different opportunities and pressures faced by different nations and HEIs (Caruana 2010; Mertkan et al 2016).

This paper focuses on the development of a policy framework for IHE aimed at creating value in the HE sector. The paper is structured in such a way that it first provides a justification of why Zimbabwe was chosen as a case study. A brief overview of the concept of IHE and its rationale given the historical, present and future Zimbabwean context then ensues. This is followed by the methodology of the study, inclusive of data collection tools, procedure and analysis. Thereafter, the results section will give an account of description of the whole process from the scoping study that formed the baseline of the project, the Theory of Change of IHE and the national policy framework. Finally, a conclusion giving highlights of the key learning points closes the paper.

The Case of Zimbabwe

Zimbabwe presents an interesting and fertile case study of harmonization and IHE in particular, from three angles. To begin with, until recently, the Zimbabwean HE landscape was characterised by unique but disparate systems, processes and procedures, presenting difficulties of compatibility and comparability of programmes and qualifications among the local universities further impacting their attractiveness internationally.

Secondly, Zimbabwe has an outstanding reputation and acknowledgement of its strong education tradition (UNICEF Zimbabwe, 2011) and an extensive history of IHE that cannot be explained simply by colonialism and its attendant discourses. For example, Tevera & Crush (2003) have found that graduates from Zimbabwe possess attractive skills desired by the labour market especially in Europe and North America where recruitment agencies aggressively seek for their skills (Eastwood et al., 2005; Rogerson & Crush, 2008). Within the region, Zimbabwe's IHE has been partly shaped over the years by its changing geopolitical position in Africa - from a relatively wealthy and stable attractor of African academics in the 1980s and early 1990s, to an increasing exporter of academics to neighboring countries. There is anecdotal evidence that Zimbabwean highly skilled migrants are doing well within the region managing for example to occupy management positions in countries such as South Africa, Namibia and Botswana. Zimbabwean academics for example are believed to take up to 60% of academic staff populations at some regional universities. A case in point is that of unconfirmed reports by academic staff at Botho university, a private university with headquarters in Botswana where in 2013, about 60% of its academic staff members in post were reported to be from Zimbabwe.

Last but not least, Zimbabwe's suspension from the Commonwealth as well as sanctions imposed by the European Union (EU) and the United States of America (USA) led to isolation of the HE sector as from the year 2000. In responding to pressures consequent to the ensuing diasporic explosion and the concomitant push for an internationalised curriculum, Zimbabwean HEIs continued to engage in aspects of internationalisation albeit in an ad hoc and uncoordinated basis. This paper therefore highlights how the country embarked on an extensive exercise to create a harmonised national framework for IHE as part of a broader exercise to reconfigure higher education to drive innovation and spur sustainable development of the country.

Historical background perspective of IHE in Zimbabwe

IHE is not a new concept in Zimbabwe and can be traced back to the colonial era when the first HEI, the University College of Rhodesia and Nyasaland (UCRN) was established in 1955. UCRN was later renamed the University of Zimbabwe at independence in 1980 (Shizha & Kariwo, 2011). Although the student body was predominantly white (Nherera, 2000), the student body reflected a mix of different nationalities. Some Zimbabwean students found opportunities to study abroad, at universities such as Fort Hare in South Africa and universities in the North. In addition, during the liberation war, a sizable number of black Zimbabweans received university education in Socialist countries.

UCRN was situated within the British colonial model of internationalisation wherein curriculum development and quality assurance were regulated by the 'parent' university, the University of London and the University of Birmingham for Medical programmes. The attractive working conditions and the high quality of education drew both international students and staff to UCRN. Expatriate whites, largely from the University of London, who essentially reproduced much of the curricula, quality and culture of the parent institution, dominated the academic and administrative staff of the institution.

Upon attaining independence, in 1980, UCRN graduates became prominent leaders, academics and professionals who provided the much-needed top-end skills grounded on the quality of education received (Gaidzanwa, 2007). The University of Zimbabwe, still the sole university then, continued to flourish through its continued links with British universities, especially around programme external examination, but also saw large influxes of Eastern European staff into some departments. Its reputation for high quality and the overall strength and stability of the Zimbabwean economy encouraged considerable inflows of staff and students from the rest of Africa.

Sanctions imposed on the settler government in the 1960s were lifted, resulting in increased international support for university teaching and research projects; staff development schemes; and student exchange programmes. Furthermore, student support schemes such as the science education teacher training project in Cuba and the presidential scholarship scheme enabled many students (2000 to Cuba and 40 000 to South Africa) to receive an international education. This period saw many foreign trained black Zimbabwean returnees joining the University as academics and management who brought with them international academic practices from other contexts thereby making the university clearly highly international.

However, this situation took a dramatic turn in the 1990s. New universities were established, initially in a filial relationship to the University of Zimbabwe akin to UCRN's historical relationship with London. Marketized reforms led to economic downturn and greater political polarisation resulting in fewer inflows but higher outflows of staff and students. The suspension of Zimbabwe from the Commonwealth and the sanctions imposed on the country resulted in isolation of HEIs from the Global North. The diasporic explosion sowed the seeds for a future reintegration into the international HE community. Moreover, the likelihood of migration led students to push for curriculum reforms and access to qualifications that could better prepare them for international employability. In responding to these pressures, Zimbabwean universities have been engaging in another new form of internationalisation, distinct from that in the mainstream literature.

Statement of Need - The Genesis of the IHE project

Pursuant to its function of 'promoting international co-operation and facilitating exchanges in HE,' the Zimbabwe Council for Higher Education (ZIMCHE), the national external quality assurance agency, participated in the Zimbabwean Chapter of an Africa-wide research project on 'Organizational Research Cultures in African Universities.' The findings of the study pointed to an urgent need for Zimbabwean HEIs to internationalize in order to foster sustainable national development. Following a benchmarking exercise, ZIMCHE noted that the University of Nottingham (UoN) had done exceptionally well in the area of IHE. Consequently, ZIMCHE requested UoN to partner it in a project to improve IHE in Zimbabwe. ZIMCHE and UoN agreed that they would engage stakeholders in the development of the framework for IHE.

The objective for the initiative was to develop a common national framework for IHE. The said framework, defined as a "living" resource, is made up of a compendium of policies, standards, values and strategies to inform and guide the IHE domains of

practice. The IHE framework is aimed at creating a system of HE that is both responsive to the requirements and proactively addresses the challenges of globalisation, yet at the same time respecting the uniqueness of the country in question (Van der Wende, 1997). For example, in the case of Zimbabwe, IHE is not the end itself, but a means to contribute to the industrialization and modernization of the country.

METHODOLOGY

The self-study methodology wherein the authors characterised ZIMCHE and the Zimbabwean HE sector as the "institutional self" showcased the harmonisation of IHTE experiences. Self-study is a qualitative research methodology, which allows researchers to reflect on and utilise their personal, professional and institutional experiences (referred to as "intimate scholarship" by Hamilton & Pinnegar (2014) as the key to develop knowledge and understanding of the profession as well as improve practice (Samaras, 2011). By recounting, reporting or documenting how the organisation or individual under study developed and implemented certain practices, processes, systems and policies, they expose them to public critique thereby inviting further ideas and suggestions for improvement (Wolf 1992). Self-study thus leads to institutional learning, goal achievement and readiness for change, Furthermore, readers can contextualise the study to their own organisation or situation and derive benefits from the lessons learnt.

Originally confined to academia (Samaras & Freese, 2009), the self-study methodology has gained widespread acceptance as a prestigious research methodology suitable for studying academic and professional settings (Borko, Liston & Whitcomb, 2007). Notwithstanding criticism regarding the objectivity of the self-study methodology, its self-introspection nature and improvement orientation makes it transparent and reliable (LaBoskey, 2004). The methodology's conceptual framework derives from the self-study theory which posits that focused and continuous self-examination, propensity to change and interaction result in valuable experience and best practices (Feldman, et al., 2004; Loughran & Northfield, 1998).

The overall study involved a scoping study with a sample of six Zimbabwean universities followed by further data collection and refinement through a series of events as follows: a seminar with ZIMCHE Secretariat; a workshop with Vice Chancellors from all universities; an all stakeholders workshop involving ZIMCHE and its partner UoN, HEIs, the MHTESTD, and a range of related Ministries including Foreign Affairs, Home Affairs and Tourism and finally workshops of the taskforce appointed to finalize the development of the IHE framework.

The scoping study, conducted in June 2017 by three researchers from ZIMCHE and UoN, explored the understandings, rationales, policies, procedures, initiatives, strategies, aspirations and challenges regarding IHE. The sample frame and interview topic guide was developed through the use of cloud-based document management and face-to-face and online meetings. The sample of six universities was created to reflect differences in institutional age, public-private status and specialism/comprehensiveness, and a staff sample was devised to reflect different ranks and responsibilities for/awareness of internationalization issues (Vice-Chancellor (VC), Registrar, International Office Director, Dean, academic). Ethical approval was obtained as required by the Zimbabwean HEIs and UoN. Data collection was done for both primary and secondary data. Primary data was collected through in-depth semi-structured interviews with a total of thirty (30) interviewees in the five categories described above as well as workshop contributions and direct observation. Although sampling was done across universities and levels of staff, the purpose was not to stratify a sample so as to test for differences across institution and level. As with many African HE systems, staff at different levels in Zimbabwe have typically experienced studying and working across a range of institutions and there is a relatively strong sectoral identity that limits the variance of views across institutions.

Secondary data included institutional documents (collected during the scoping study of HEIs) and included national policy documents; internal (ZIMCHE) documents, for example documentation produced during the process as well as follow-up reports from the seminar and workshops. This comprehensive information from primary and secondary data sources allowed the authors to analyse the self-assessment of the harmonisation of IHE project stating the background, rationale, processes, procedures, outcomes and learning points.

In relation to the data analysis, five stages were involved as follows:

- Exploration of the relevant concepts and theories found in the literature to come up with the appropriate context.
- Interview data was recorded and transcribed and then analyzed thematically. This involved collaborative discussions between researchers which produced a draft coding framework based on awareness of the existing international literature and national debates. Each of the three researchers took transcriptions from every institution for individual coding. The initial codings were then discussed at an online coding workshop where the framework was revised and emerging major themes were deciphered. Two drafts of the analysis were presented at the ZIMCHE workshop and the workshop for VCs.
- Documentary evidence that would give insight into IHE activities of HEIs

(e.g. strategic plans, annual reports, internationalization strategies or policies and curriculum documents) was also analyzed thematically.

- The results of the scoping study were used to develop a theory of change (TOC) for IHE in Zimbabwe. The TOC was then presented at an all stakeholder workshop on IHE which was held on the 3rd of July 2018 at the Rainbow Towers Hotel, Harare. At this workshop the TOC was put into action through the drafting of a policy framework for IHE.
- The draft framework was further interrogated and developed by all university Registrars with guidance from a UoN expert.
- The fifth and final stage was the consolidation of the findings for purposes of writing up this paper.

RESULTS

The results from the scoping study are presented first. These will detail the IHE activities, challenges and interventions as well as the tools, outcome and impact. The procedures and outcomes of the seminar with ZIMCHE; workshops with VCs and all stakeholders as well as the taskforce meetings will ensue to highlight the development of the IHE theory of change and policy framework.

The Scoping Study

IHE Activities, challenges and interventions

The scoping study revealed that HEIs were engaged in the following internationalization activities and initiatives: student and staff recruitment, establishment of research and teaching partnerships and collaborations, conferences and workshops; membership to international associations; setting up international structures and transformation of the curriculum to produce economically engaged graduates. These graduates would not only find employment locally and internationally, but could create employment.

It was clear that whilst all institutions were desirous of engaging in IHE initiatives, this quest was however fraught with thorny issues that needed to be addressed if IHE was to be harnessed fully in Zimbabwe and for it to achieve the intended benefits thereof. These challenges included uncompetitive (too high) university entry requirements with other countries in the region and elsewhere in Africa, financial constraints, immigration restrictions, language problems, shortage of academics with PhDs, dollarization of the Zimbabwean currency; political climate; sanctions as well as marketing strategy and drive.

Among suggested key interventions was the need to capitalise on ZIMCHE's role of facilitating the internationalization of HEIs in terms of for example, harmonization of IHE through guidelines/frameworks, supporting the design of IHE policy, and the development of IHE structures. There was also need to create awareness and research on IHE, and embarking on online provision to mitigate some of the challenges.

IHE Tools, Outcomes and Impact

Respondents identified a range of desired IHE outcomes that needed to be achieved. These include: increased presence of international students and staff; active memoranda of understanding (research, teaching, and exchanges); increased impact research and publications; increased innovations and patents; increased harmonized programmes and relevant curricula and favourable international rankings. They however indicated that for these outcomes to be realized institutions needed to be equipped with the necessary tools and opportunities. In this regard, there was need for project findings to feed into the development of policy briefs and guidelines which in turn would inform the development of a national IHE policy for Zimbabwe. HEIs would then be able to derive their own institutional IHE policies from the national one. This would facilitate harmonization of IHE in Zimbabwe. Further, internationalization structures such as the establishment of international offices would help HEIs achieve the desired outcomes. The need for conferences to share experiences as well as training workshops to support institutions was also highlighted.

The desired outcomes were expected to generate impact, defined as a change, effect, or benefit to the quality of life in terms of socio-economic, cultural, environmental, health, technological, political and legal and technological pillars, beyond academia. These pillars were seen are anchored by cross-cutting aspects such as new products, policies and behaviours; improving efficiency and efficacy of existing practices and improving sustainability. Such impact would result in the production of economically engaged graduates who not only find employment locally and internationally but are also able to create enterprises for themselves and become employers. This way HEIs can be seen as transforming themselves into agents of the industrialization and modernization of the Zimbabwean economy for sustainable socio-economic transformation.

The Seminar with ZIMCHE

The preliminary results were presented to ZIMCHE for consideration in September 2017. The issues were deliberated on by the ZIMCHE Secretariat who resolved to invite Heads of HEIs to partner ZIMCHE in designing 'the IHE theory of change (TOC)' for Zimbabwe. TOC is a recent methodology popular with development

agencies for its ability to link activities, outputs outcomes and the achievement of goals. The IHE TOC process requires HE stakeholders to define the essential and adequate conditions necessary for achieving the desired goal of producing economically engaged graduates. TOC utilises backward mapping to identify interventions necessary to achieve the desired goal (Taplin, et al, 2013). This creates a set of connected outcomes known as a "pathway of change," a framework around which the other elements of the theory such as indicators, means of verification and assumptions are developed. TOC leads to more efficient planning, monitoring and evaluation, because progress towards the achievement of longer-term goals can easily be measured beyond mere identification of outputs (De Silva, et al., 2014).

Workshop for Vice Chancellors and Heads of Tertiary Institutions

The workshop for VCs and Heads HEIs was held on December 11, 2017 at the Monomotapa hotel, Harare. The 45 participants developed a TOC that would see HEIs contributing to the national goal of sustainable socio-economic development by leveraging on the benefits of IHE in assisting HEIs to industrialize and modernize Zimbabwe. The participants deliberated on the pilot findings and developed a TOC (Figure 1). For each of the seven outcomes, the expected outputs, activities, indicators, means of verification and assumptions were spelt out thus completing the TOC framework. The TOC framework formed the basis of the development of an IHE policy framework at the all stakeholder workshop.

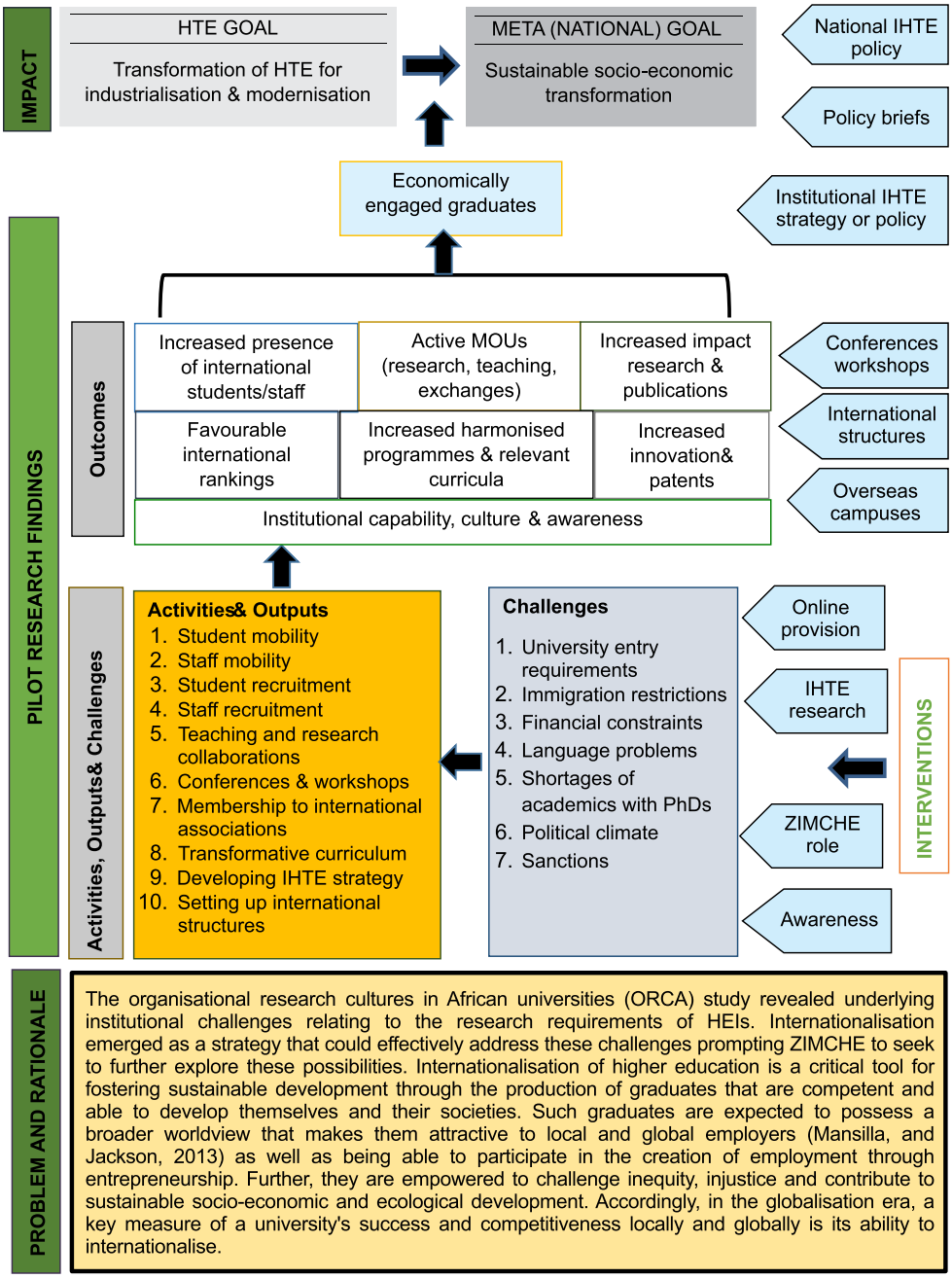

Figure 1: IHE Theory of Change

Workshop for all Stakeholders

The all-stakeholder workshop on IHE was held on the 3rd of July 2018 at the Rainbow Towers Hotel, Harare. It leveraged on the new political dispensation's thrust towards re-engagement and was guided by the vision of the Ministry of Higher and Tertiary Education, Science and Technology Development (MHTESTD) to come up with frameworks to re-configure HE and create value through teaching, research, community service, innovation and enterprise development (Education 5.0). By so doing, the HE sector would spearhead the nation's quest to industrialize and modernize in order to achieve the middle-income status by 2030. The workshop programme and the profiles of key facilitators was availed to the 350 invitees attracting 285 participants from various government ministries, MHTESTD, universities, polytechnics, industrial training Centres, teachers colleges, industry and commerce, Research Council of Zimbabwe, ZIMSEC and ZIMCHE.

Some of the highlights of issues raised at the workshop included:

- The importance of interacting with international partners and participate in the world economy;
- In response to the effect of globalisation, HEIs should operate on an increasingly international basis;
- Zimbabwe should take advantage of the high literacy rate to attract Foreign Direct Investment through high quality programmatic education which produces goods and services. This way, HEIs should move from being cost to being revenue centres;
- The need for MHTESTD to assist in the recruitment of foreign students was underscored.
- The need to put in place internationalization structures; partnerships with recruiting agencies as well as the establishment of international offices will help institutions to attract students to Zimbabwe.
- HEIs were also engaging with the entrepreneurial institution concept wherein by inculcating entrepreneurial and innovation skills and values in students, sustainable development could be realised through tangible research outputs, self-reliance and enterprise development. This resonates well with Nyerere's (1966) advice that it was prudent to always situate 'international standards' within the context of local needs.

The workshop attracted good publicity both nationally and internationally for example of an article 'HE must look inwards before turning outwards – Minister'

that came out of an international London based publication the *University World News*. The publication (http://www.universityworldnews.com/article.php?story=20180704170817210) draws from some of the world's journalists of repute, and is accessible to worldwide readership.

Developing the framework for IHE

In order to develop the policy framework for IHE, participants were divided into seven groups each led by a university Registrar and given time to further brainstorm on the seven (one outcome was added to the existing 6 previously identified outcomes). Each of the seven groups was tasked to address questions that would shape the IHE framework around the following seven outcomes of IHE identified by the TOC:

① increase in the presence of international students and staff;

② active memoranda of understandings (research, teaching, and exchanges);

③ increased impact research and publications;

④ increased innovations and patents;

⑤ increased harmonized programmes;

⑥ relevant curricula and favourable international rankings; and

⑦ Institutional capability, culture and awareness

Taskforce Workshops

To further work on the framework beyond the workshop a taskforce was formed made up of all university Registrars, ZIMCHE, UoN, representatives from tertiary institutions as well as other key stakeholders. The taskforce held two workshops in July 2018 to further develop the general guidelines for the IHE framework and resources. An expert from the UoN global engagement office (working together with researchers) was responsible for guiding and overseeing the development of the IHE framework as well as benchmarking with international best practices.

During the development of the framework all stakeholders were given an opportunity to provide comments. These inputs into the process had a great impact on the final product. Engagement was done telephonically, through e-mails, website and workshop presentations. The IHE framework is a living document that will be subjected to regular revisions and updates in order to fully respond to the changing HE environment.

DISCUSSION

The goal of this project was to develop a well-researched IHE policy framework that represents the input and consensus of all the stakeholders. The framework will provide HEIs with a basis upon which to develop their own institutional policies. Whilst noting that every HEI is engaged in some form of internationalization, harmonization of internationalization processes by way of a national policy and guidelines to institutions was highlighted as being critical for ensuring best IHE practice for each institution and for providing the critical support that institutions needed in their IHE initiatives. For example, a well-structured approach to internationalization would give momentum to research thereby attracting experienced academics (local and foreign) who want to contribute to Zimbabwe on temporary or full time bases. There is need to identify ways of accommodating academics and professionals who would not necessarily have to leave their current jobs (unless if they so wish) in order to contribute to the development of Zimbabwe.

Powerful lessons for Zimbabwe and beyond can be derived from this project. Firstly, the complexities of IHE noted in the literature above (Caruana 2010; Mertkan et al 2016) were made more evident in this study in terms of the challenging process of mobilizing diverse institutions to co-develop a national IHE policy that all institutions could identify with. In this regard the role of a respected, trusted as well as strategically positioned body such as ZIMCHE, in terms of its overseeing mandate of HEIs and its links with the responsible Ministry as well as other related sectors has been critical to the success of this harmonization project. In this regard ZIMCHE has been able to access HEIs in the scoping sample and interview high profile staff; mobilize HEIs to productively participate in the project. Relatedly, collaboration of HEIs in this project, working together at strategic levels has had the effect of evidencing the effectiveness of collaboration when developing national policy frameworks. As noted by the registrars who were tasked with collating ideas into a draft of the policy framework document, the exercise benefitted from the diverse expertise and practices of their institutions to ensure that there was full representation. The result is a document that all institutions can identify with and use.

Similarly, the evidence-based multi-pronged approach which involved consultations at various levels including the scoping study, seminar with ZIMCHE secretariat, workshop with all Vice Chancellors, workshop with key stakeholders, working meetings with all Registrars and collaboration and knowledge exchange with an internationally recognized partner provided a scientific based rigorous approach to this research and development project. The success has been due to buy-in by all key

stakeholders who, again, feel a strong sense of ownership of the process and product. In addition, multi-sectoral involvement, as highlighted in literature (Shriberg 2002), has been critical to the successful operationalization of IHE in Zimbabwe. For example, key Ministries which facilitate mobility such as Foreign Affairs and Home Affairs needed to be engaged to lobby the development of policies that support staff and student mobility.

The multi-national research project ORCA, noted above, has confirmed the general view in the literature that African academia and scholarship is crippled by operating in a resource poor environment (e.g. Zoogah & Nkomo 2011). In our case, the availability of funding to conduct research and run a series of workshops has contributed to the success of the project. To this end funding was a collaborative effort provided by: the MHTESTD, ZIMCHE and its partner, UoN and HEIs in a clear show of the benefits of IHE.

CONCLUSION

The project has only laid the critical foundation for IHE in Zimbabwe. IHE will be a continuous process involving for example, the development of institutional IHE policies and strategies/agendas and operationalization of IHE. This will require continuous support of institutional initiatives and activities by the Ministry and ZIMCHE through funding and capacity building activities. In addition, the benefit of cross-institutional collaboration has been highlighted and that the success of IHE is to be found in the strengths within the institutions themselves is evident.

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ACKNOWLEDGEMENTS

This project was kindly funded by the ESRC Impact Accelerator Account, University of Nottingham; Zimbabwe Council for Higher Education and the Ministry of Higher and Tertiary and Education, Science and Technology Development, Zimbabwe.

Qualitative and Quantitative Effects of Quality Assurance Review of Academic and Support Units

By

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ABSTRACT

This paper reports on a focus area as part of a larger study on quality assurance in higher education and follow up articles are envisaged.

Four programmes at University of KwaZulu Natal were selected that were reviewed recently and academic indicators of pass rates/ graduation rates of programmes were analysed to determine if the review process had any effect on these academic indicators. Quantitative methodology was utilised to analyse data captured from the Higher Education Management Information (HEMIS) and statistically analysed to determine if there were significant differences in pass rates/ graduation rates after these programmes were reviewed.

Concluding statements reflect on the efficacy of the quality assurance system on academic indicators analysed.

Key words: *Quality; assurance; efficacy; higher education*

1: INTRODUCTION

Evidence available to the Higher Education Qualification Committee (HEQC) shows that institutions in South Africa have positively engaged with the requirements for assuring quality and developed and implemented systems for the management of quality.[1] Although some institutions have more mature quality systems than others, many which have undergone institutional audits have managed to add emphasis to quality in their quality plans.

The quality process commences already during the design stage of new academic programmes. The process of accreditation of new programmes, as part of the quality process, undergoes rigorous scrutiny and approval at both institutional and HEQC levels, however, review data of the institutional accreditation process shows that a number of institutions have yet to develop the internal capacity to be consistently successful in their accreditation applications. There is a better understanding of meeting the minimum standards of quality with regard to teaching and learning as well as a greater awareness of the need for intellectual discussions in academic disciplines about programme content, pedagogy, delivery, student support and professional academic development for staff with national and international best practices, as was seen, for example, in the national review process of 2009.[2] Quality Assurance (QA) policies have consequently been facilitated in many HE institutions world-wide to ensure the provision of high quality education, university accountability and transparency in the use of public funding and to meet the needs of students, employers and other stakeholders.[3]

During the last twenty years that quality assurance practices have imploded onto the higher educational institutional sector, very little evidence of the impact of quality assurance has been established.[4] Banta[5] found that only 6% of 146 profiles on quality assurance approach evaluated, contained evidence that student learning had improved. In the ensuing period, public perceptions, and especially government attitudes, shifted markedly toward greater scrutiny and scepticism. Quality review has arguably met this challenge by providing publically accessible information about institutional effectiveness to inform taxpayers and potential customers.[4]
With the recent massification of Higher Education (HE) and the concurrent increase in governmental investment into higher educational institutions, doubts have surfaced concerning the possibility of maintaining quality in these resulting new circumstances with larger numbers of registered students, as well as the significance in the importance of HE in the new knowledge society.[6] Traditional mainstays of QA, such as defining quality in terms of resources, faculty research productivity,

admissions selectivity and conformity to conventional educational practices and requirements, are often impractical or simply irrational in today's educational reality.[7]

With HE being challenged by a number of changes in the past decade - massification, internationalisation, the growing importance of knowledge-led economies and the advent of new education technologies - traditional quality assurance approaches have to be reviewed to determine their efficacy.[8]

2: PREVALENT INTERNATIONAL QUALITY ASSURANCE SYSTEMS

During the last 20 years the management of academic quality assurance and improvement at the institutional level was based on designated key performance indicators.[9] Presently university decision making is evidence based and business intelligence tools that is data-driven and remedially strategized is utilised as the core of the institutional quality system.[9]

Currently quality assurance foci have moved into the classroom with teaching and the consequences thereof being evaluated. This would require extensive review, analysis, modelling, consultation, documentation, new techniques and practices for the measurement of student learning.[10]

3. BACKGROUND TO THE REVIEW OF ACADEMIC PROGRAMMES

Selesho[11] researched whether the concept of the application of self-evaluation mechanisms achieved its objective of assuring accountability and improving performance in South Africa. Universities have incorporated and applied in their evaluation practices the notion of internal self-evaluation since the establishment of the Certification Council of Technikon Education in 1986[12] and the Quality Promotion Unit in 1996 by introducing a university quality management system.[13] Since the inception of this practice at universities there has not been any in-depth analysis of this mechanism, hence its validity, effectiveness and efficiency may not be confirmed with a great degree of certainty. Research methodology utilised in Selesho's study included questionnaires and personal telephone calls to four Universities of Technology (UoTs), their QA Managers and all the Academic Heads of Departments. Questions focused on the level of experience of academics connected to the programmes undergoing QA, QA mechanisms used by the participating institutions

as well as the departments within these institutions. His findings[11] revealed that the collective involvement of all staff in a department is integral in enhancing the quality of departmental academic programmes. If the Council for HE (CHE) or the HE Quality Committee's (HEQC) QA policies are adhered to vigorously, it can also leave a lasting legacy of quality awareness and a QA tradition of self-regulation. Similarly Houston[14] , in reviewing the achievements and consequences of two decades of QA in HE, has seen significant expansion and harmonisation of QA mechanisms in South Africa, although there was limited evidence of positive effects on the quality of core processes of teaching and learning. In exploring the paradox of the separation of assurance from improvement, a shift in focus is suggested from surveillance to systemic approaches to improvement.

Harvey and Williams[15] reviewed internal QA, improvements in learning and teaching as well as assessments of the impact of QA. They also analysed papers about quality enhancement instruments such as student feedback surveys, which have played an increasingly prominent role in quality processes since the early 1990s. Their review suggested that QA has resulted in clearer documentation and transparency, although external processes could be better aligned to everyday academic activity. QA has become an international concern and procedures have become increasingly standardised across international boundaries with, for example, the establishment of the European Standards and Guidelines for QA in the European HE Area which was adopted in 2005.[6]

The consumers of education, i.e. students, families and employers, view QA of education as orientated mainly towards ensuring standards of qualifications.[16] Significantly, this consumerist approach to HE quality that is driven by governments and senior management, has not been met with enthusiasm by HE participants.[17] There appears to be a strong commitment to autonomy and academic freedom, which indicates that the academia is prone to inertia and compliant indifference. Conclusions suggest that it is still not clear that, even after 15 years, QA systems have really enhanced HE.[15]

4. QA IMPROVEMENTS IN HIGHER EDUCATION

At the beginning of the so called "quality revolution"[18] during the last 20 years it was expected worldwide from most of the established national quality agencies that internal quality systems and the development of an internal quality culture would emerge automatically in HE, due to the external quality impact. Kristensen[18] argues

that a better balance must be found between internal and external QA and quality improvement. On examining QA processes in HE Institutions (HEIs), Loukkala & Zhang[6] concluded that HEIs are ideally expected to develop internal quality cultures which take into account their institutional realities and which are related to their organisational culture. Consequently, a large number of European universities have fundamental policies, structures and processes that support QA interventions such as pedagogical innovation and staff development.[6]

5. PROBLEM STATEMENT

An internal self-evaluation is the starting point in any QA process.[11] Since the inception of this process at traditional universities and Universities of Technology (UoTs), very little in-depth analysis of this process has been done at South African HE institutions. During the past twenty years QA practices have abounded in the HEI sector, but very little evidence of its impact has been established.[4] Banta[5] found that only 6% of 146 profiles on QA approaches which were evaluated, contained evidence that student learning had improved. In the ensuing period, public perceptions and especially government attitudes have shifted markedly toward greater scrutiny and scepticism. Quality review has arguably met this challenge by providing publicly accessible information about institutional effectiveness to inform taxpayers and potential customers.[4]

In the world of education, policy makers and funding agencies have a responsibility to invest in educational systems. Consequently QA assessors are required to ensure accountability by on-going supervision and recommendations.[19] In South Africa, QA in HE has a bearing on the policies, systems and processes directed at ensuring the quality of education provision.[13] To maintain the strive for excellence in academic programmes, QA methodologies have to triangulate in a synergistic manner and inform the complexities and nuances of all core activities related to programme management and implementation, as well as quality management. These include quality control, evaluation, reflection, growth, development and enhancement, and planning.[20] .

The goals for the quality in HE are articulated by the HEQC (HEQC: 2001:09) as fitness of purpose, value for money and transformation.

These goals have never been achieved by the HEQC, apart from the annual reporting submitted by individual HEIs indicating their graduate outputs. These goals are to be achieved within the ambit of the principles for HE set out in the constitution

and national education policy which is inclusive of academic freedom, institutional autonomy and public accountability.[13]

If QA in HE is to serve the public good, first an inclusive as well as a socially accountable understanding of concepts such as "fitness for purpose" and "value for money" must be reached and implemented. Second, QA should be fully compatible with democratisations, as well as with the goals and purposes of autonomous academic institutions where stakeholder involvement in the co-production of quality precedes bottom up on the basis of inclusive understandings of intellectual freedom and accountability. Thirdly, QA should support the development of critical citizens to align with the traditional role of HE in educating citizens by developing their intellectual capacity. The work of achieving outcomes such as these three is crucial and on-going and is moreover generally located within other unresolved issues in HE QA e.g., graduate attributes.[21] A strategy of determining the effectiveness of a QA system would be to evaluate the outcomes before and after the internal/external review programmes.

In light of the above, the main research question that this study sought to investigate can be formulated as follows:

What are the effects of internal quality assurance reviews on the outcomes of selected academic programmes at the University of KwaZulu-Natal?

The general aim of the study was to determine the effectiveness of internal QA audits of selected academic programmes in terms of prescribed criteria as set out in the QA policy of the University of KwaZuluNatal. As mentioned earlier, the prevalent literature is very vague on the effects of internal QA assessment of academic programmes. Consequently this research study attempted to determine statistically whether the internal QA system had an effect on the indicators of student success, i.e. pass rates, throughput rates and graduation rates of selected academic programmes at the University of KwaZulu-Natal;

6. DESIGN AND METHOD

A mixed research design was followed in this study. A mixed method approach is a type of research combining elements of qualitative and quantitative research approaches.[27] These two methods together complement the strengths of qualitative and quantitative approaches respectively and offset the different potential weaknesses of both approaches.[28] By combining qualitative and quantitative data, stronger and

more corroborated conclusions are arrived at compared to a single type of data set.[28]In this research output, the focus is more on the quantitative phase the study.

Qualitative designs typically investigate behaviour as it occurs naturally in non-contrived situations without any manipulation of conditions and experience. In this sense qualitative designs are non-experimental. The data consists of words in the form of rich textual descriptions rather than numbers.[29] Quantitative research, on the other hand, utilises numbers based on administrative data with relative precision, enabling analysis by using statistical tools.[30] This approach is a cross-sectional representative study, but is does not assist in testing for causes and effects. Combining both qualitative and quantitative strategies into mixed methods approaches eliminates bias towards either qualitative or quantitative paradigms.[31] Consequently Tashakkori and Teddlie[32] have described mixed methods studies as "… combining the qualitative and quantitative approaches into the research methodology of a single study." Mixed research ultimately addresses both the quantitative data ("what") and the qualitative data ('why").[33]

The multiple case study method, also utilised in this study, was deemed appropriate for this research as it provided breadth and depth of understanding of the research problem.[27] Cohen et al.[33] define multiple case designs as having more significant data than double the amount of data on a single case study. In a comprehensive discussion on the use of case study research, Gay, Mills and Airasian[34] point out that it is a research approach in which a researcher focuses on a unit(s) of study known as a bounded system(s), e.g. individual academic schools at a university. It can also be viewed as an investigation of a phenomenon that occurs within a specific context. Leedy and Ormrod[35] explain that in a case study, the researcher collects extensive data on the individual(s), programme(s) or event(s) on which the investigation is focused. These data often include observations, interviews, documents, past records and audio-visual materials. In this study, the case study method followed both the interpretative tradition of qualitative research and a post-positivist tradition by drawing on numerical data quantitatively to enhance an understanding of the phenomenon (the effectiveness of QA).

6.1 Data collection instruments

In this research project, the researcher made use of open-ended questionnaires, documents and past records. Managers of selected academic programmes were contacted in order to elicit information on benchmarks before and after an internal quality review analysis. In so doing, the success of qualitative intervention was

established. Document analysis was also utilised by in-depth studying of past and present audit reports for the selected academic programmes participating in the study. Finally, data were extracted from the HEMI (Higher Education Management Information) Data System to collate information on academic outputs, e.g. throughput rates, graduation rates, publications, etc.

6.2 Population and sampling

Population refers to all the academic programmes active in HE Programmes at the University of KwaZulu-Natal. Based on the specific context at the time of active empirical research and availability of information, selected academic programmes that were subjected to programme reviews during the previous years were sampled to participate in the study. This was a case of purposive sampling. On the basis of my knowledge of the population, a judgment was made about which units should be selected to provide the best information to address the purpose of the research[29] and who would best contribute to the research objectives. The University of KwaZulu-Natal was chosen as it is extremely difficult to obtain relevant data on QA of academic departments from any other HE Institution. Fortunately the researcher was in the employ of the University of KwaZulu-Natal and + could thus utilise the data to conduct this research project. As mentioned earlier, the following academic units were involved:

- College of Science, Agriculture and Science: School of Mathematics;
- College of Health Sciences: School of Pharmacy;
- College of Law and Management: School of Accounting, Economics and Finance;
- College of Law and Management: School of Management Studies Educational Unit.

6.3 Data analysis

Information was extracted from the HEMI System (past records) indicating numerical data on outputs, e.g. graduation rates and student success rates Subsequently ANOVA statistical procedures were performed on the information to determine whether differences in these academic indicators before and after the review were significant.

7. RESULTS AND DISCUSSION

7.1 Accounting Programme

The Undergraduate Accounting programme in the School of Accounting, Economics and Finance which offers six modules, was reviewed in June 2012 at the Westville and Pietermaritzburg campuses.

Data on the percentage that passed for the period 2004 up to 2013 are presented in the following table, followed by the statistical analysis.

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Table 1. Statistical analysis: Overall pass rate by year (passed/enrolled): Accounting Programme

Year	Observed	Mean (%)	Std Error (%)	95% Confidence Interval (%)
2004	3462	77.38302	0.7701	75.95221 - 78.76743
2005	5477	71.04254	0.61287	69.82122 - 72.2414
2006	5691	71.27043	0.59983	70.07531 - 72.4437
2007	5689	67.49868	0.62098	66.26405 - 68.71535
2008	5342	69.63684	0.62913	68.38392 - 70.86827
2009	5197	64.46027	0.66934	63.14152 - 65.76276
2010	5729	64.28696	0.63305	63.03046 - 65.5289
2011	5522	66.71496	0.63414	65.45442 - 67.95781
2012	4610	61.49675	0.71668	60.07431 - 62.9046
2013	4281	66.80682	0.71972	65.37342 – 68.21726

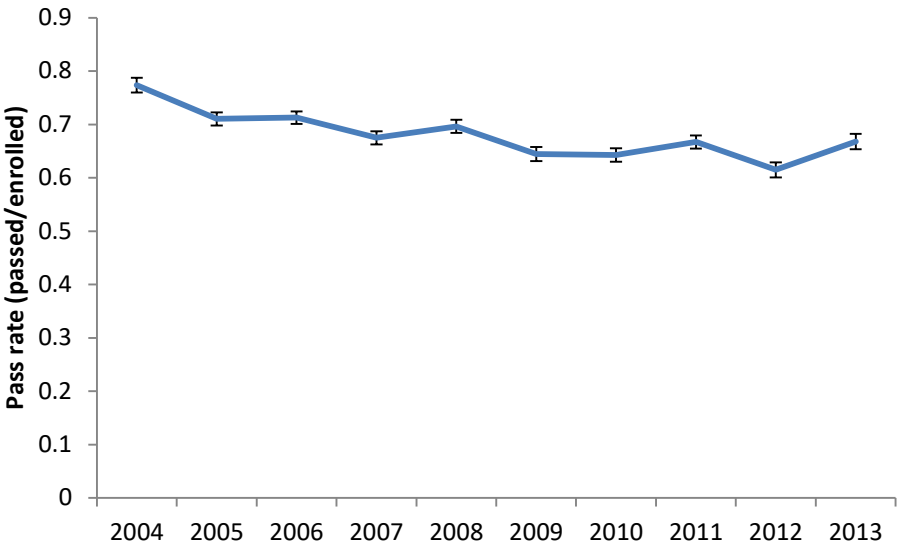

Figure 1: Pass rate for Accounting modules in the School of Accounting, Economics and Finance from 2004- 2013

The above data reveal that there is a 68% significant difference in the pass rate from 2012 to 2013. The Accounting Programme was reviewed in 2012.

The results are presented for a ten year period from 2004 to 2013. Over this period the pass rate fluctuated between a minimum of 62% in 2012 to a maximum pass rate of 77% in 2004. Large drops or increases in particular years may be associated with particular strategies selected by the programmme Head. Kift, Tinto, Zepke and Nelson[36](https://www.academia.edu/8074410-assessed 23/11/14) suggest that strategies of student-centred and transitions pedagogy, institutional approaches to student engagement and changing practices in assessment and learning design may be fundamental in fostering success in the academic domain. Of significance is the fact that the Accounting programme was reviewed in 2012 and certain recommendations were made by the review panel. It is probable that the implementation of these recommendations resulted in the overall Accounting pass rate increasing from 62% in 2012 to 66% in 2013.

Enrolment patterns varied from 3 462 students registered for Accounting programmes in 2004 to a maximum of 5 729 in 2010. Class numbers are one of the factors that influence success rates as the huge enrolment in 2010 could have resulted in a decline of the pass rate to 64%. This corresponds with findings by Giannakopoulus & Buckley[37] (www://uj.ac.za - Assessed 17 Nov 2014) who point out that attrition rates started to

increase in South Africa as universities complied with the education demands of the masses. Strydom, Kuh &Mentz[38], also concluded that graduation rates between 1993 and 2005 have declined with the massification trend at South African universities. Increasing attrition rates is not only a South African phenomenon as massification of higher education in France and the USA resulted in attrition rates of around 47% and 37% respectively.[39]

It is noteworthy that the smallest enrolment in 2004 of 3 462 students resulted in the best success rate of 77% over this ten year period. This has implications for the massification of education programmes in maintaining successful pass rates. Smit[40] expounds that massification of higher education allowed the diversification of the student body which enabled students with deficient educational backgrounds to enter universities. This is linked to Criterion 9 as laid down by the CHE[41],which requires that universities provide adequate academic and student support staff to effectively deliver support to all students, in particular those entering from disadvantaged schools.

By analysing modular results it becomes clear that all pass rates have declined from 2004 to 2012. Since the review of 2012, four modules have not exhibited a decline in modular pass rates and only two modules showed a decrease in their modular pass rates (Accounting 200 and Management Accounting 300).

From a statistical perspective, however, significance at the 95% level ($p < 0.05$) is required to reject the null hypothesis. With a p-value of 0,72 ($p > 0.05$) this indicates that the study failed to reject the null hypothesis and the research hypothesis could not be supported. Although the differences in pass averages as portrayed in table 1 are significant (61.5% in 2012 and 66.8 in 2013) in terms of average percentages, there is *statistically* no significant difference at the 95% confidence level. This means that the study could not prove that any statistically significant differences in pass rates before and after the review could necessarily be ascribed to interventions as proposed by the review panel after the review.

7.2 School of Management Studies Support Programme

The Education unit of the School of Management studies was reviewed in 2009. Consisting of six consultants and tutors, this unit is responsible for the overall management of the teaching and learning activities of approximately 10 000 students enrolled in the School of Management Studies.

The following table depicts the number of graduates that emanated from the School of Management from 2000- 2012.

Table 2: Number of graduates from the School of Management Studies from 2000 - 2012

Year	Number of graduates
2000	743
2001	988
2002	1120
2003	1289
2004	1119
2005	1053
2006	1148
2007	1046
2008	1025
2009	912
2010	774
2011	894
2012	1080

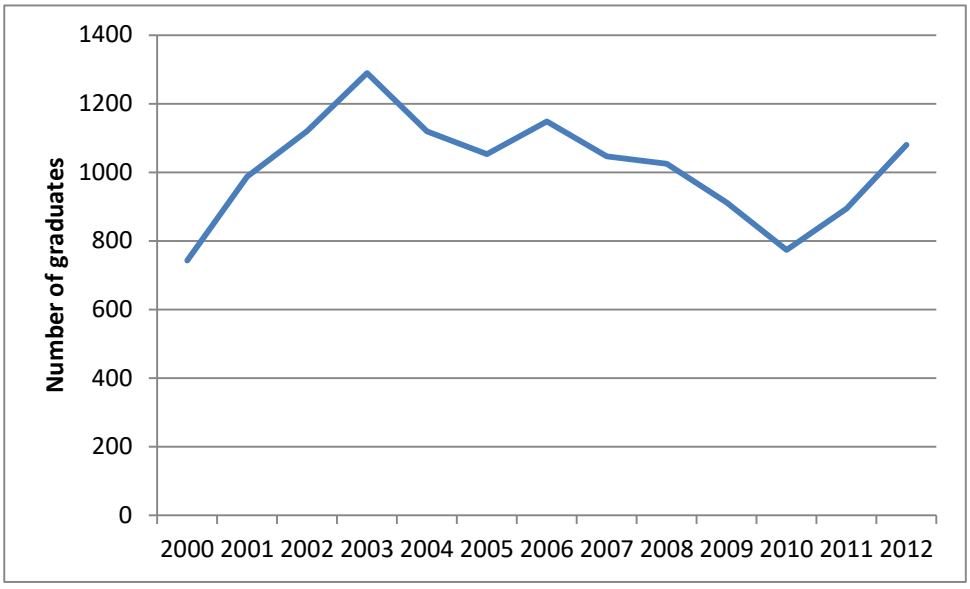

Fig.2. Number of graduates from School of Management Studies: 2000-2012

The number of Management Programme graduates varied from a minimum of 743 in 2000 to a maximum of 1289 in 2003. This indicates the effects of various interventions during this period, *inter alia* the implementation of a strategic plan consisting of pedagogical strategies, setting up certain structures within the unit and appointing a unit head. Since the review of 2009 (with 912 graduat**e**s) the number has increased to 1080 graduates in 2013. This most likely reveals that the recommendations from the 2009 review had a positive effect on the graduation rate of students. The analyses of the number of graduates in the larger programme of Bachelor of Commerce reveals that the number of graduates since 2000 (303) has steadily increased to 643 in 2012. This compares very favourably to the 617 graduates in the School of Management in 2009 when the review was carried out. Even the second most popular programme, the Bachelor of Commerce (Honours), exhibited a tripling in graduate numbers of 48 in 2000 to 185 in 2012. This is also an improvement from the 133 graduates in the Bachelor of Commerce Honours in the year of review of 2009. Figure 2, which depicts the graduate numbers in all programmes in the School of Management over the thirteen year period, shows a consistent and significant increase in graduate numbers over all undergraduate and postgraduate programmes since the review of 2009.

7.3 Mathematics Academic Programme

The School of Mathematical Sciences was reviewed in February 2008. This schools' programmes manages the offering of 21 modules towards the Bachelor of Science degree programmes with a duration of three years. The School is presently housed within the School of Mathematics, Statistics and Computer Sciences at the Westville Campus, with a few designated lecturers servicing the Mathematical Sciences programme at the Howard Campus.

Table 3. School of Mathematical Sciences: statistical analysis of module results

Year	Mean Pass rate (%)	95% Confidence Interval
2004	63	60.83903 - 65.09005
2005	65	63.51785 - 67.13846
2006	70	67.82177 - 72.00536
2007	70	68.16621 - 72.47268
2008	76	73.33554 - 77.89928
2009	74	71.72738 - 76.04963
2010	69	66.77878 - 70.83776
2011	72	69.92454 - 73.84579
2012	71	68.94389 - 72.87019
2013	70	67.08009 -70.83922

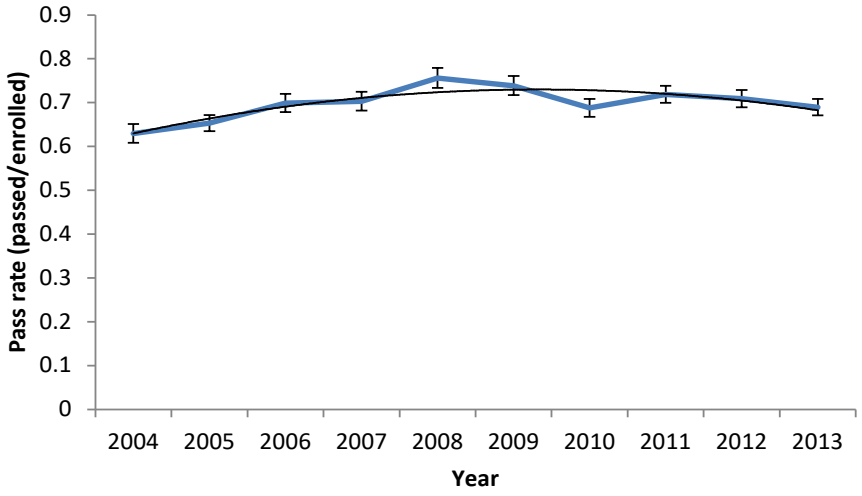

Fig 3. School of Mathematics: Overall pass rate 2004-2013 (Pass/ Enrolled)

The School of Mathematics was reviewed in February 2008.

Results spread over ten years show a large variation which can be attributed to various strategies applied in this programme. According to the Head of the school strategies implemented after the review included a more cohesive management structure, establishment of a school-wide teaching and learning committee, regular school-wide meetings, rotation of staff between branch campuses, standardised student

evaluation of lectures, review of moderation reports, appointment of a Teaching and Learning Manager, a re-designed website, and clarification of the choice between the major streams of pure and applied mathematics.

During the year of the review (2008) most modules managed in the school peaked across the ten year period of analysis. This is indicative of the increased focus on the implementation of modules during the year of review (2008). Since then, 14 of the 21 modules managed in the school have improved pass rates, or had the same pass rate when a comparison is made between the 2009 pass rates and the 2008 pass rates. This overall decline in pass rate since the review may be ascribed to the fact that HEIs are increasingly under pressure to fill the large gap in mathematical skills with underprepared incoming Mathematics students from secondary schools. Strategies, such as sending matriculants to special educative camps before entering universities so as to assist in enhancing their underdeveloped numeracy and literacy skills, have since been implemented.[42] Mji and Makgato[43] also pinpointed the drastic and significant shortcomings in mathematics and science teaching expertise in South African schools that placed South African last in the UNESCO and UNICEF learner achievement numeracy project conducted in 2005.

Enrolment figures varied from 5 444 in 2004 to 7542 in 2013. Due to budgetary constraints there has not been an increase of academic staffing over this period. Larger class sizes without a simultaneous increase in academic support may also have caused a decline in pass rates. Academic tutor support for larger classes is also warranted to enhance pass rates.[44] This provides support in online learning and independent study methods. Consequently, universities need to strategise to establish the numeracy skills of learners coming from secondary schools and who have a largely deficient background in mathematical skills.

From the values and a significance level of 72-76% in 2009 (as depicted in Table 3) it is clear that the study failed to reject the null hypothesis It can be affirmed that there is, therefore, no statistical significant differences between the pass rates in Mathematical Sciences before and after the 2008 review.

7.4 Pharmacy Academic Programme

The School of Pharmacy and Pharmacology was reviewed in October 2009. This school manages the offering of 28 modules in a Bachelor of Pharmacy degree programme, designed with a duration of four years. The school presently employs 24 academics and 11 support staff and the programme is only offered at the Westville Campus.

Table 4. Statistical analysis of School of Pharmacy and Pharmacology module pass % results

Year	Observation	Mean (%) Pass rate	Std. Error (%)	95% Confidence level (%)
2004	1736	94.81567	0.53212	93.66577 – 95.81088
2005	1906	96.01259	0.44818	95.03436 – 96.84575
2006	2053	97.07745	0.37175	96.25395 – 97.76254
2007	1995	92.98246	0.5719	91.77203 – 94.0646
2008	2072	96.5251	0.40234	95.64376 – 97.27137
2009	2200	96.45455	0.39426	95.59468 – 97.18758
2010	2189	96.11695	0.41292	95.22074 – 96.8868
2011	2353	97.91755	0.29438	97.25615 – 98.45552
2012	2870	99.16376	0.16998	98.75829 – 99.46349
2013	2799	98.85673	0.20094	98.38985 – 99.21673

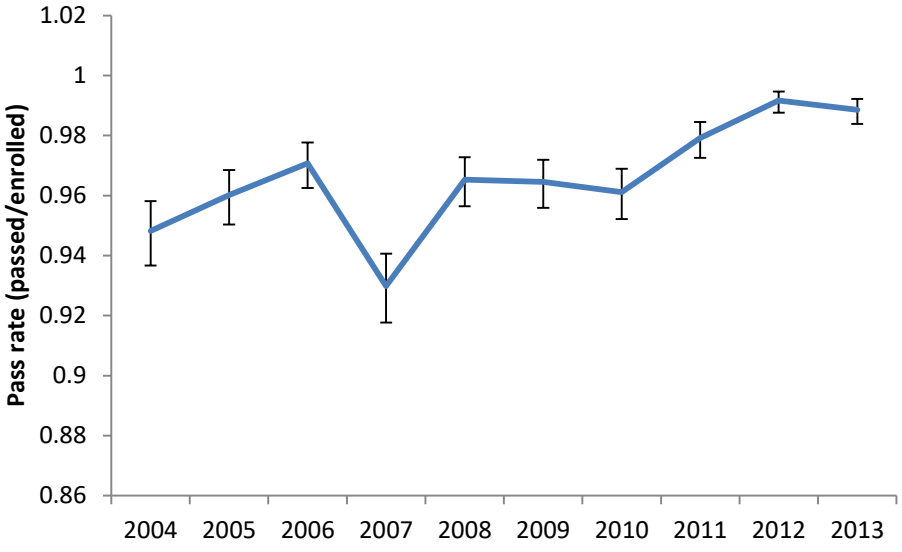

Fig 4. Pass rates: Pharmacy Academic Programme: 2004-2013

Fig. 4 depicts that within the 95% confidence limits that there is strong correlation with an improvement in results since the School of Pharmacy review of 2009. This had peaked in 2012 with a slight downturn in 2013.

Depicting the pass rates of 24 modules in the School of Pharmacy and Pharmacology, figure 4 reveals that all the modules have shown consistency or elevated pass rates since the review of 2009. Enrolment numbers over the ten year period have not varied significantly. Consistent class numbers with consistent numbers of academic support staff have sustained the module pass rates across the School. Over the ten year period of analysis, pass rates varied from a minimum of 93% in 2007, peaking with a 99% pass rate in 2012/ 2013. Since the review of 2009, when the Pharmacy Programme's pass rate was 96%, this has increased by 3% to 99% in 2013. This suggests evidence of the positive effects of the review of 2009.

Amongst the four case studies analysed in this research project, the School of Pharmacy and Pharmacology exhibits the largest pass rate. Analysing one of the criteria in review principles[41], that of admission criteria, the School of Pharmacy and Pharmacology has the highest admission criteria of 28 points at Grade 12 level, suggesting academically stronger students than in other programmes. It is therefore not surprising that results are consistently higher compared to the other programmes.

8. CONCLUSIONS

The Accounting Programme, Management Studies Education unit and the Pharmacy programme have produced positive academic indicators of success in enrolments, graduation and pass rates after the review process. Only the Mathematics programme produced a negative trend after the review process. This finding of poor performance in Mathematics students amongst South African undergraduates is not encouraging according to CHE.[45]

Summatively, Quality Assurance reviews have shown a positive effect on Accounting, Management and Pharmacy programmes by enhancing the pass rates or graduation rates at the University of Kwa-Zulu Natal.

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Feasibility of a National Policy on Research Data Management for Higher Education Institutions: A Case of Zimbabwe

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ABSTRACT

Research data management is a vitaltool in research andneeds policies to be in place that will enable the collection, storage, preservation and access of the data for future development. In order to achieve Zimbabwe's vision of being a middle-income economy by 2030, development must be driven by researchers and be built from national research repository, which should not only entail research output but also research data. This study was aimed at assessing the need and feasibility of creating a national policy for RDM focusing on the research council of Zimbabwe, librarians from Higher Education Institutions and Ministry of Higher and Tertiary Education as study respondents. The study was carried out in the form of a survey having employed the qualitative research approach. Findings revealed that awareness is not as important as in depth understanding of RDM so as to have smooth formulation and implementation of a national policy, instead stakeholders need to acknowledge the major issues surrounding RDM which include acquiring skills, the legal and technological aspects as they are integral in successful RDM implementation in the HEIs.

Keywords: *Higher education institutions, National policy, Research, Research data management,*

1.0 INTRODUCTION

Zimbabwe has high literacy levels, people learning from primary to tertiary education (BSs, MSc, MPhil and PhD) where research is being conducted at various academic institutions (Public and Private). Some of the research information is being published, while the other remains unknown. In addition, there is no smooth flow of research outputs amongst the researchers and the academic libraries to foster development from access and utilization of the information. Jones et al (2013) mentions that Higher Education Institutions (HEIs) research data represent available institutional assets which have the potential to be reused beyond the active research phase. Managing research data is an integral part of the research process. It can be challenging particularly when studies involve several researchers and when studies are conducted from multiple locations. Therefore, to fully manage the data it will depend on the types of data involved, how data is collected and stored, and how it is to be used throughout the research lifecycle (Pinfield et al, 2014).Thus, there is a need to consolidate the literacy, research outputs and human capital to improve livelihoods in Zimbabwe through informed research. This is necessaryto find options of creating a platform for easy access to research data from various institutions. In addition, the international community/ donors and governments are increasingly advocating for researchers to properly store and share data (Buys and Shaw, 2015) for funding. Corti et al (2011) notes that good data management practice facilitates verification of research results thereby making it easier for the researchers to build on the existing research.

Zimbabwe has the potential to achieve its 2030 vision as set out by the government, but only through collective efforts from all stakeholders including academic institutions and enabling policies. HEIs should be able to share research data as well as outputs to attain the vision 2030 mainly via Research Data Management (RDM). In essence, Whyte and Tedds (2011) say RDM concerns the organization of data, from its entry to the research cycle through to the dissemination and archiving of valuable results. It aims to ensure reliable verification of results, and permits new and innovative research built on existing information. Hickson et al (2015) noted that researchers were not very forthcoming with their datasets and that mentality needs to be changed. Chigwada et al (2017) mentions that there is no evidence to show how research institutions are managing research data in Zimbabwe although a lot of research activities are being done. The authors of this paper find it prudent

to then assess the need for a national policy which will stand as a referral point as well as guide HEIs as to how to undertake RDM services. To avoid one institution being ahead of the other, standardization is necessary. Research, according to the Education 5.0 thrust by the Ministry of Higher and Tertiary Education, Science and Technology Development (MHTESTD), leads to industrialization and innovation, eventually improving livelihoods. Under Education 5.0 this will take the country to the next step closer of attaining Vision 2030 which ideally seeks to make Zimbabwe an upper middle-income economy a standard set by the World Bank entailing higher standards of living, lifting the country from its current state of sanctions-induced de-industrialization and negative growth. Currently the MHTESTD does not have any policy documentation on RDM. Taking into account that RDM has a number of issues involved including skills, technology and infrastructure, the HEIs in Zimbabwe are aware of these as some have most systems in place, most don't for various reasons to be brought out by this research. Having a national RDM policy can be considered necessary especially in the case of Zimbabwe as it will encourage compliance within the HEIs, if the document is binding, most institutions will adopt the RDM and offer RDM services.

1.2 Research Objective

The study was done with the following research objectives:

1. To find out if the Zimbabwean information custodians are aware of RDM
2. To identify the need for a national RDM policy
3. To find out the key players in the formulation and implementation of a national RDM policy

2.0 LITERATURE REVIEW

2.1 Importance of RDM and libraries

Poole (2015) points out that research data sharing through RDM facilitates new theories to be developed and from the accessed information and also helps validate science by reproducing already reported findings. Furthermore, development of knowledge across different fields depends on how data is analysed and interpreted according to different perspectives (Ou and Zhou,2016). Generally, researchers are not aware of the importance of preserving datasets for future and also lack the ability to comprehend their data management plans to enable future sharing (Renwick et al, 2017 and Van Loon, 2017). However, scientific laws and innovations are built with

researchers tapping on other research within the RDM by fine- tuning what is already existing. University of Twente (2018) notes that good scientific practice is one of the main reasons to manage research data during and archive the data after the project. It goes on to say, it is important to keep available the raw, processed and/ or analysed data, as well the documentation necessary for understanding the data and the way it is collected, processed and analysed. The ACRL in its 2016 report highlighted the importance of research data services, data policies and data management plans among the different issues which influence libraries in HEIs. Triparthi et al (2017) highlights that libraries have always adapted to the changes brought by technologies and have in this context, stepped in to provide RDM services to their researchers.

2.2 Studies done on RDM in Zimbabwe

Nhendodzashe and Pasipamire (2017), posit that developing an RDM service is a noble idea to enable sharing of information but the major challenge was the legal framework and skills lacking within institutions for advocacy. It was also noted that the University of Zimbabwe (UZ) had the two pillars to promote the development of RDM which were Technological infrastructure and finance. Apart from financial costs incurred in upgrading ICT, staff training, particularly the librarians were a major drawback in promoting RDM services at the university of Zimbabwe. Ndhlovu (2016) highlighted that there was low competence in ICT and digital curation among some library staff at the National University of Science and Technology (NUST) yet it is vital for the implementation of the RDM. Chigwada et al (2017) worked on research institutions in Zimbabwe and indicated lack of support by institutional authorities and researchers negatively affected RDM. It was also noted that authors recommended establishment of research data repositories, and use of already existing research data repositories registered with Research Data Repositories to ensure that research data standards are adhered to when doing research.

2.3 National policy

To avoid fragmentation of research and development there is need for a national policy which will cascade to various institutions in order to develop a sustainable RDM. According to Australian National Database Service, the policy should address ownership of research material, their storage, their retention and appropriate access by a broader research community. Policies are mostly used to provide credentials for those promoting RDM, to gain access to funding for IT infrastructure which will in turn promote RDM. According to Greenbaum and Gerstein (2003), it is important to adopt appropriate technical standards, practices and architecture plus good legal

framework to facilitate access to and use of research data, in short that's the policy. The policy should also entail the need to hire new staff, re- skilling and upgrading of librarians to match the RDM task. The policy will help to stop allegations of research misconduct and assist in protection of intellectual property, reproducibility, replicability and credibility of research.

3.0 METHODOLOGY

Pickard (2013), mentions that research design of a study is the overarching strategy or plan of action that a researcher maps out to perform an empirical inquiry. Creswell (2014) goes on to say, it's a plan and procedure that guides the whole research activity from general assumptions to specific methods and tools for data collection, interpretation and analysis. The study was conducted in the form of a survey and employed the qualitative research approach. The study focused on librarians in Higher Education Institutions in Zimbabwe, the research and technology transfer department in the Ministry of Higher and Tertiary Education, Science and Technology Development and a member of the Research Council of Zimbabwe. The aim was to explore the perceptions and understanding of librarians on research data management. Qualitative research approach enables one to study and understand the meanings of one's feelings, actions and underlying principle of behavior, (Bryman, 2015). A population of 20 respondents was purposively selected by the researchers to include: 2 research directors from Ministry of Higher and Tertiary Education, Science and Technology Development, 1 member from Research Council of Zimbabwe and 17 librarians from different universities (both state and private) around Zimbabwe. The researcher considered it appropriate to select a sample based on the knowledge of the population; informed consent was sought from the participants and identifiable data was anonymised for confidentiality purposes. The study was conducted in April 2019. The questionnaire technique was used for the librarians using online survey; the link to survey monkey was sent where they completed the online questionnaire. The questionnaire gathered information about the librarian's understanding of research data management and to find out their perceptions on a national policy on research data management.

The interview technique was then used for the directors in research at the ministry of higher and tertiary education, science and technology development as well as research council of Zimbabwe. The interview gathered information as to how the respondents viewed RDM in Zimbabwe as a whole, its significance to attaining vision 2030 and if a national policy could be created towards the RDM movement. Qualitative data within Survey monkey was further analysed using qualitative content analysis.

Bryman (2004) describes qualitative content analysis as process of searching-out for underlying themes in materials being analysed. Qualitative content analysis has been defined as, "A research method for the subjective interpretation of the content of text data through thesystematic classification process of coding and identifying themes or patterns" (Hsieh and Shannon, 2005). Qualitative data collected through interviews was analyzed using content analysis methodology which groups data with similar messages together and codes it.

4.0 RESULTS AND DISCUSSION

4.1 Level of awareness, knowledge and utilization of RDM in Zimbabwe

The majority (88 %) of the study sample indicated that there were aware of RDM while 12 % were unaware of the existence of RDM (Figure 1). Those who were unaware of RDM also included 6 % who were not very sure of such a service. Our results show there is a buildup in the last 2 years in terms of awareness of RDM after Chigwada et al, (2017) study who cited over 70% people lacked awareness. Further interrogation on the depth understanding and knowledge of RDM showed that storage/preservation/archiving is a key pillar followed by sharing which had 28 % and 25 % votes respectively. Organising data and creation of the database of the information were ranked at the same level (having 16 % voters) while 3 % only indicated the value of legal and ethical pillars in RDM (Figure 2). Given that three pillars were not identified as major aspects when in fact they are key in smooth running of the RDM indicates that the in-depth knowledge might be lacking from the degree curriculum and might subsequently affect implementation of the policy if implemented. For example, the UK Data Archive (2015) cited legal, ethical and other obligations as mandatory before advocation and promoting the RDM policy. Furthermore, the variance in understanding of the pillar of RDM contradict with the fact that 88 % are aware of the concept and they might be need to educate most of the key stakeholder and the custodians of the RDM. Sixty four percent of the institutions are using RDM while 24 % were not using utilizing the service (Figure 3). Such high use of the management systems then confirms the high knowledge base of the concept or can be policies that are forced on by management without analysis their staff capabilities (staff competency audits). High utilization also indicate that institutions acknowledge the value of RDM systems for their students, clients and researchers. However, the benefit of having a localized RDM might not communicate to a large audience thus the need to have a national RDM policy. One key stakeholder mentioned that two institutions (UZ and MUAST) were in the process of merging the

IR so that both parties would accrue more benefits but still that not enough if we are to meet vision 2030 of the second republic.

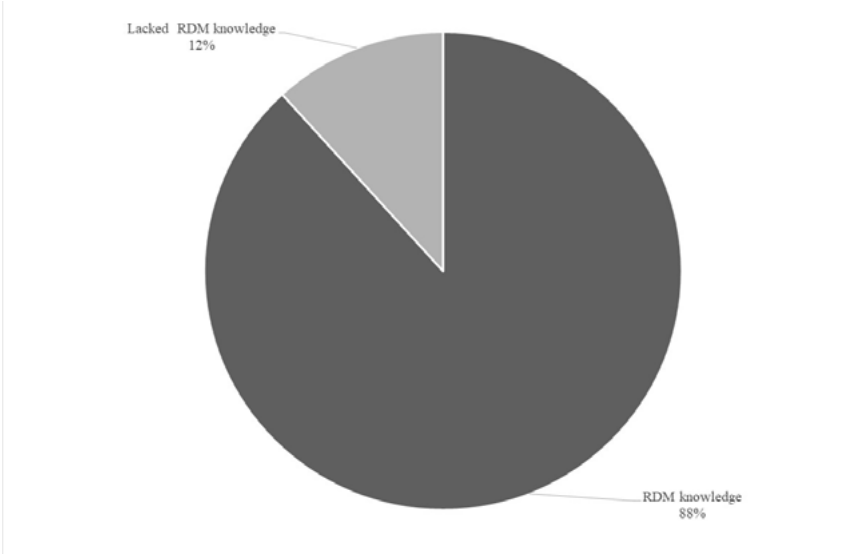

Figure 1. Level of awareness of RDM amongst the study sample in 2019

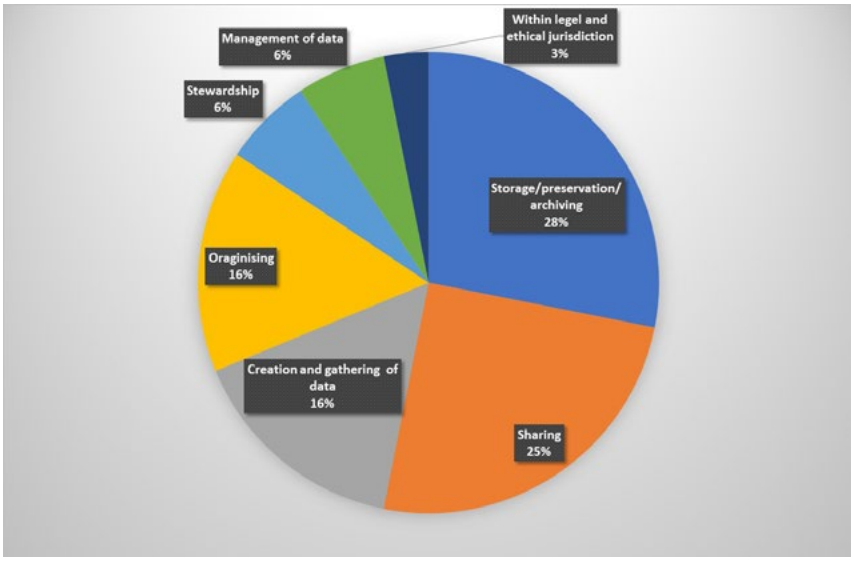

Figure 2. In depth understanding of RDM concept

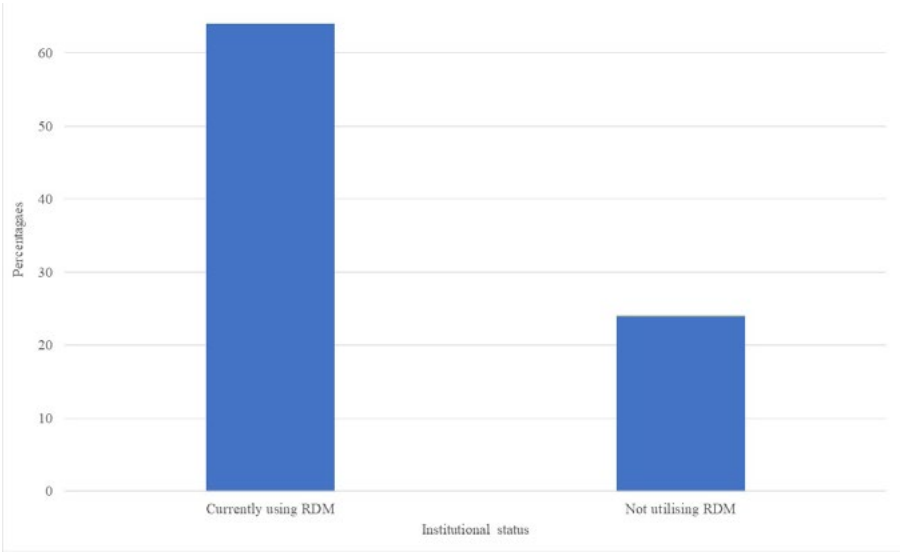

Figure 3. Utilisation of RDM in various institutions in Zimbabwe

4.2 Relevance of in economy and research leading to formulation of national policy on RDM with HEI

All the respondents indicated that RDM would play a key role in achieving Zimbabwe's vision 2030 agenda. This is also confirmed by the fact that the majority of the institutions are playing their small but critical role in implementing RDM. It is recognised that research drives innovations and development, this study highlighted that RDM would reduce duplication, encourage sharing and reuse of research information as they had the highest ranking to facilitate research with HEI (Table 1). Transparency and safeguarding of information were also other benefit highlighted for higher education research across the country and beyond (Table 1). The Zimbabwean government has identified that research is key in development and a new policy stipulating that 2 % of the national budget must be channeled into research was implemented in 2019. In most cases such funding would be channeled through HEI and having an RDM policy would avoid duplication of work and subsequently produce strong taskforce to solve national problems. Some funders can also benefit from the RDM if implemented as they would be able to track and verify authenticity of the research outputs.

This study identified about 15 stakeholders for the formulation of the national policy of RDM. The stakeholders were further grouped into major players (with > 20 % votes) including librarians as key (45 % votes), ministry of higher education, research council of Zimbabwe while the minor stakeholders had < 15 % votes (e.g. industry, ZULC, ICT managers, national archives) (Figure 5). The fact that the librarians were highlighted as the most important stakeholder in formulation of the RDM policy supports the fact that they are custodians and managers of information. However, given that this study used purposive sampling targeting librarians and has shown knowledge fragmentation in some RDM aspects is a challenge. Beside changing the curriculum, some seminar on RDM might have to be done to ensure that the policy formulation and implementation would be smooth. It is important to note that all the mentioned stakeholders are important and they play different roles in ensuring that development is attained by 2030. For instance, research will be done under HEI using money from government via ministry of education while RDM is managed by the librarian and then the industry can utilize the innovation for development. After formulation, about 36 % of the respondents indicated that the policy must be enforced or implemented in all the academic institutions while the rest of the pillars had similar 14 % votes from the ranking. A logical implementation framework would start with enforcing (step 1) and end up with centrally managed by librarian or research boards (step 5) (Table 2). Enforcing the policy would allow all institutions to take it up and not have the current scenarios where 24 % are not using some kind of RDM. At the same time enforcing would drive the same national agenda of developed as set by the government.

Table 1. The importance of RDM in Zimbabwe research and economy

RDM Analysis questions	Highlighted themes	Responses
As key in Zimbabwe's economy	Very critical	100%
As key in Higher Education Research	Very relevant	100 %
	Avoid duplication of research	56.25 %
	Sharing and reuse of information	50%
	Transparency	12.5 %
	Safeguarding data	6.25 %

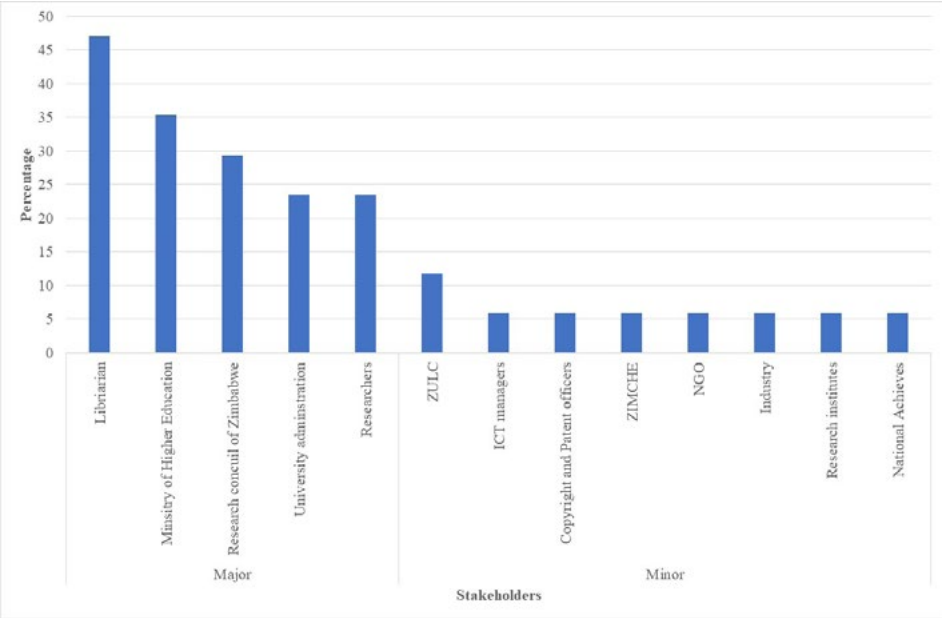

Figure 5. Stakeholders in the formulation of Zimbabwe RDM policy

Table 2. Building up the framework for RDM implementation within HEI

Way forward on RDM policy implementation	Perception Percentage	Steps to be followed
Enforcing the Policy once developed	36	1
Workshops ad trainings on RDM benefits	14	2
Collaborating and networking amongst institution and researchers	14	3
Centralised database and catalogue	14	4
Centrally managed by libraries and research boards	14	5

5.0 CONCLUSIONS

This study showed that awareness is not as important asin depth understanding of RDM so as to have smooth formulation and implementation of a nationalpolicy. The need to drive research and development was shown to be key for Zimbabwe to achieve its 2030 vision with the utilization of RDM in all HEIs. The study highlighted the need for a national policy and it must be implemented upon development. The development of the policy requires various stakeholders with librarians playing a major role while three major steps (trainings, collaborations, central database creation) were identified to kick start the formulation process. A national RDM policy that will clearly state how all research data should be preserved for future access is a must to subsequently attain vision 2030 of Zimbabwe and make research more valuable to the nation as a whole.

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Benefits of Research Management and Administration for African Universities – The Way Forward

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ABSTRACT

Research Management and Administration (RMA) is an evolving profession and practitioners can be found in many universities in Africa. Fundamentally, RMA is support for research and researchers and covers pre-award and post-award administration as well as wider issues such as reporting and ethics. The research infrastructures developed for faculty of many African universities do not fully deliverRMA. This paper discusses RMA using the ten parameters of Higher Education Institutional Capacity Assessment Tool (HEICAT) developed by the International Research and Exchanges Board (IREX), USA, to analyse the top two hundred universities as published by Webometrics in 2019. The HEICAT is a benchmarking tool with 18 parameters, however, only the most salient ten have been explored here: Strategic Research Management (SRM), Opportunity Scanning (OS), Research/ Grant Management (RGM), Research Dissemination (RD), Research Ethics (RE), Professional Contribution (PC), Research Incentives (RI), Professional Development (PD), Student Research (SR), Sufficiency of Research Facilities (SRF). Theseconcern research management and knowledge transfer. The results of the analyses showed that most of the universities meet the set standards on RD, PC, SR and SRF but do not meet those for SRM, OS, RGM, RE, RI and PD. The study concludes thatdue attention to the weak links should lead to improvements in the research management capacities of African universities and hence an increase in the quality and quantity of research.

Keywords: *Administration, Africa, Benefits, Management, Research, RMA.*

INTRODUCTION

Research Management and Administration (RMA) as a profession is evolving in the African continent, for examplehaving developed over only the last twenty years in the West African Sub-region. The umbrella professional body of RMA in the region is the West African Research Management Association (WARIMA) which was founded in 2006.

RMA began in universitiesin the United States of America following World War II, in the 1950's. RMA emerged later in the United Kingdom during the Thatcher-era because universities needed to attract external funding and underscore their social relevance(Spencer and Scott, 2017; Virágh, Zsár, and Balázs, 2019). At that time, RMA became important because the external funders required a business-like reporting system that the core faculty members regarded as substantial distractions from research. In addition, the university research management system becamemore complex because of the myriad types of research agreements to be processed and executed. The growth of biomedical research in the 1990s, however, accorded RMA much recognition because funders were increasinglyinterested in the research governance structures for the promotion of transparency, accountability and due process. Since, 1959, many national and regional RMA associations have emerged, including:the National Council of University Research Administrators, (NCURA), Society for Research Administration International (SRAi), in the USA, the Association of Research Managers and Administrators (ARMA) and Praxis-Auril in the UK, DARMA in Denmark, Finn-ARMA in Finland, FORTRAMA in Germany, Ice-ARMA in Iceland, NARMA in Norway, the European-wide EARMA, and more recently ARMA-NL in the Netherlands. As previously noted there is WARIMA in Western Africa, and sister associations CARIMA, EARIMA and SARIMA in Central, Eastern, and Southern Africa respectively. There are many others around the globe such as ARMS in Australasia, BRAMA in Brazil, CARA in Canada, and RMAN-J in Japan.

RMA is being recognised around the world forproviding support for research in universities (Kerridge and Scott, 2018; Shelley, 2010). African Universities aim to achieve greater research prowess in the world but do not possess the mature RMA structure required for this(Kerridge and Scott, 2018; Popoola and Owoaje, 2012).This paper analyses the top two hundred (200) universities in Africa ranked by Webometrics, using ten (10) parameters of the HEICAT tool, with a view to

determining their extant research management capacities. The aim of this analysis is to discover the status of RMA in African universities and to point out the areas to improve to achieve global competitiveness in research.

LITERATURE REVIEW

Virágh, Zsár and Balázs (2019)provide a brief account of the history of RMA, and indicate that the function dates to the post World War IIera andthat the first professional body emerged in the US in 1959 – theNational Council of University Research Administrators (NCURA), more information on the development in the U.S. can be found in Beasley (2006).Research management and administration evolved out of the need for researchers to focus more on core research activities by finding professionals who specialise in the management of external research funds to strengthen collaborations, showcase impact, do internal assessments and generally promote transparent research governance structures. As reiterated by Schützenmeister (2010), three levels of analytical framework are necessary in any research system – policy, strategy, and performing or operational levels.

Although RMA in Africa is still in its early stages, its importance in African universities cannot be overemphasised (Kahn, 2012; Kroukamp, 2012). According to Popoola and Owoaje (2012), Research Management (referred to as RMA in this paper) comprises the setting up of independent research-friendly environment for the purpose of effective management of institutional policies on research. The fundamental challenge facing the deep institutionalisation of RMA in African universities, especially those in Sub-Saharan Africa, is developing a sustainable and viable RMA framework and policy. RMA enables credibility of research by satisfying institutional and legal obligations and ensuring that there is strict adherence to financial management. However, it is also important to note that RMA is the duty of all stakeholders in research because it is the responsibility of all researchers to supervise their research to ensure effective deliverables in budgets/budgets compliance, ethical/integrity compliance and project administration compliance (Kerr, 2012). The focal point of RMA is premised on the internal regulation of research management activities, not about the core scientific research ideas themselves. Aside the regulatory issues of research, the actual scientific execution and management of research ideas is the sole responsibility of the scientists/researchers/faculty (Campbell, 2010).

RMA as a process contains multiple tasks that run throughout the timeline of a research project (Spencer and Scott, 2017; Trindade and Agostinho, 2014). In addition, it emerged due to the complexities of research and innovation projects

that oftentimes require nonrelated research roles for prompt completion. Hence, there is the need for RMA operators to possess a vast range of knowledge and skills (Wedekind & Philbin, 2018). Schützenmeister (2010) discusses the influence of RMA on research groups within universities. Furthermore, he describes the characteristics of research organisations.Trindade and Agostinho (2014) seek to find out the operational definitions of research management from a wider perspective by identifying the required skills and competencies for the roles. They further construe research management administration as a semi-academic field that lies between the non-academic and the academic fields that possess the traits of both academic administration and core academics, referred to as *blended professionals* working in the *third space* by Whitchurch (2009). Such a definitional perspective blurs the boundary between administrative and academic roles and empowers RMA with a multi-disciplinary and multi-level structure.

Kerridge and Scott (2018)articulateanother definitional approach to RMA which tries to capture the differing terminology used in various parts of the world for ostensibly the same function. RMA is used here to encompass research administration, research management, research and innovation management, research management and administration. They conclude that RMA is aglobal profession but thatit is more advanced in some regions than in others, which might be linked to the availability of certification and an empowered workforce.From the literature, RMA in Africa seems to be lagging, hence the need for this study, there is no doubt that good RMA where introduced isa catalyst for great research as well as proper and efficient research.

METHODOLOGY

The analytical tool used for the study is the Higher Education Institutional Capacity Assessment Tool (HEICAT) developed by the International Research and Exchanges Board (IREX, 2019). The instrument contains eighteen parameters, but we have made use of only ten (10) for this research work. These parameters are Strategic Research Management (SRM), Opportunity Scanning (OS), Research/ Grant Management (RGM), Research Dissemination (RD), Research Ethics (RE), Professional Contribution (PC), Research Incentives (RI), Professional Development (PD), Student Research (SR), and Sufficiency of Research Facilities (SRF). They are further described briefly as follows:

- **Strategic Research Management –** An institution takes strategic approach to research management through identifying areas of institutional strength and focus.

- **Opportunity Scanning –** An institution systematically reviews international research grant and collaboration opportunities.
- **Research/Grant Management** – Every institution has administrative unit(s) which is responsible for research and grant management with a systematic approach to reviewing and approving research.
- **Research Dissemination** – An institution has procedures in place to disseminate research outputs (e.g. publishing unit for handling journals, newsletters, monographs and series; and a public communications unit)
- **Research Ethics –** An institution has a documented research ethics procedure which is consistently applied.
- **Professional Contribution –** Universities or research institutes require their faculties to publish in professional journals, present papers at conferences and take part in professional organizations.
- **Research Incentives –** Institutions provide enabling environment for research (e.g. time, training, facilities) which incentivise research activity.
- **Professional Development –** Faculties are supported in developing necessary skills and knowledge to undertake research successfully (e.g. grant writing skills, research methods skills, training on research ethics).
- **Student Research –** Research is integrated into curriculum at undergraduate and postgraduate levels.
- **Sufficiency of Research Facilities –** Equipment and facilities supporting the institution's research activities is sufficient to ensure smooth and uninterrupted operations.

These 10 parameters were selected because theyfocus on research and research management and administration activities. Each parameter is tracked on the websites of the selected universities and rated as follows: *Does not meet criterion (1); Somewhat Compliant (2); Meets Criterion (3); Exceeds Criterion (4).*

The Higher Education Institutional Capacity Assessment Tool (HEICAT), as designed by the International Research and Exchanges Board (IREX), is a user-friendly institutional or consultant assessment tool for the field of RMA in institutions of higher learning. All the university administration support fellows of IREX/Carnegie Corporations use the tool to make some pre/post fellowships assessments of their institutions. The toolkit contains a robust facilitator's guide, qualitative data collection tool, scoring matrix and a report template.

The data for this research were collected from the websites of the 200 African Universities adjudged as the topmost on the continent by Webometrics and published on its website in January 2019. The choice of the Webometrics' website for the collection of this data was informed by its wider coverage and collection of useful, updated and multimodal dependable statistics about universities in the world which made available ratings of web presence and impact over a specified period. For this study while the Webometrics data were published in January 2019, our collection was done from 1st March 2019 to15th April 2019. The data are available in fig share (Akindele & Makinde, 2019).

Weaknesses

While efforts were made to reduce subjectivity by the same research assistant using the IREX toolkit for all 200 universities, there is still a risk that some scores given could be challenged. In addition, the search terms "research management" and "research administration" may not have targeted all required information – however other parts of the websites were also looked at order to score each of the ten elements as accurately as possible. But it would be impossible to be exhaustive.While every effort was made to be comprehensive it is possible that some information may have been missed and so some grades could be argued to be higher than we recorded, however we view the lack of accessibility of information on the website as a reasonable indicator that support for the area in question is not well developed.

Finally, some information could be on the website but in areas restricted from outside users, this was not controlled for other than the assumption that such HEICAT related information should be shared externally to aid collaboration, and failure to do so suggests a lack of maturity in terms of research support.

Inclusion Criteria

The websites of all top two hundred (200) universities in the Webometrics ranking for universities in Africa, as published in January, 2019 without prejudice to language used on their websites, were selected, see Akindele & Makinde (2019).

Exclusion Criteria

The websites of all other African universities that did not make the top 200 universities position in the Webometrics ranking of universities published in January, 2019 were excluded. Also, all other universities that made the top 200 universities in Africa from other ranking websites, aside from the ranking website of Webometrics, were excluded.

Results and Discussion

Table 1 below contains the number values on the rating matrix as well as the percentage values of the individual ten (10) parameters as identified in the methodology of this research work.

	SRM n(%)	OS n(%)	RGM n(%)	RD n(%)	RE n(%)	PC n(%)	RI n(%)	PD n(%)	SR n(%)	SRF n(%)	Total n(%)
4 (Exceeds Criterion)	4(2.0)	2(1.0)	2(1.0)	5(2.5)	3(1.5)	0(0.0)	3(1.5)	0(0.0)	2(1.0)	3(1.5)	24(1.2)
3 (Meets Criterion)	59(29.5)	37(18.5)	16(8.0)	133(66.5)	34(17.0)	129(64.5)	54(27.0)	11(5.5)	136(68)	71(35.5)	680(34.0)
2 (Somewhat Compliant)	52(26.0)	53(26.5)	33(16.5)	39(19.5)	24(12.0)	48(24.0)	67(33.5)	63(31.5)	49(24.5)	104(52.0)	532(26.6)
1 (Does Not Meet Criterion)	85(42.5)	108(54.0)	149(74.5)	23(11.5)	139(69.5)	23(11.5)	76(38.0)	126(63.0)	13(6.5)	22(11.0)	764(38.2)
TotaIn(%)	200(100.0)	200(100.0)	200(100.0)	200(100.0)	200(100.0)	200(100.0)	200(100.0)	200(100.0)	200(100.0)	200(100.0)	2000(100.0)

Table 1: Comprehensive data of RMA in 2019 Webometrics top 200 universities in Africa using ten HEICAT parameters.

Strategic Research Management (SRM)

As seen in Fig. 1, in the case of SRM as a parameter, 42.5% of the universities "do not meet criterion'; 26.0% are 'somewhat compliant'; 29.5% 'meets criterion' while only 2.0% exceed criterion. The data analysis showed that the institution with sense of direction on SRM are fewer than the ones without such. Therefore, if the benefits of SRM are to be enjoyed, more Africanuniversities must evolve strategic plans for research management/administration.

Fig. 1: Strategic Research Management

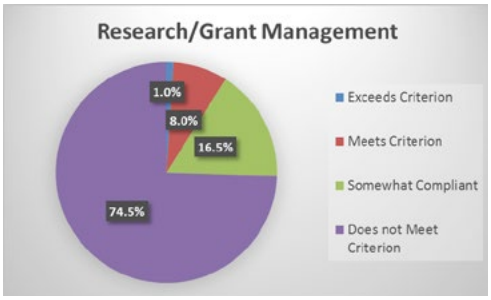
Fig. 2: Opportunity Scanning

Opportunity Scanning

In the area of opportunity scanning, the data retrieved and analyzed showed that 54.0% of the universities do not meet the criterion, 26.5% are somewhat compliant while 18.5% meet the criterion and only 1.0% exceed the criterion. This is represented in Fig. 2. This shows that most universities in Africa are non-compliant with carrying out a thorough review of collaboration opportunities and research grants.

Research/Grant Management

As represented in Fig. 3, the data reflected that 74.5% of the universities considered do not meet the criterion, 16.5% are somewhat compliant, 8.0% meet the criterion and 1.0% exceed the criterion. This implies that most African universities do not possess administrative unit(s) or offices to manage grant and research management to systematically review and approve research.



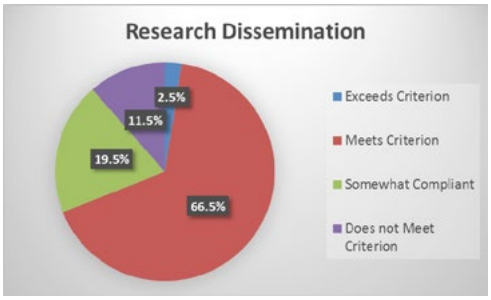


Fig. 3: Research/Grant Management

Fig. 4: Research Dissemination

Research Dissemination

As for research dissemination, from the data gathered, 66.5% of the total sample size considered meet the criterion while 19.5% are somewhat compliant, 11.5% do not meet the criterion and 2.5% exceed itas represented in Fig. 4 it is confirmed from the extracteddata that most African universities possess active procedures to properly disseminate**.**

Research Ethics

Regarding the level of compliance to research ethics, Fig. 5 showed that 69.5% do not meet criterion, 12.0% are somewhat compliant, 17.0% meet criterion and only 1.5% exceed criterion. The analysis suggests that most African universities do not have any documented research ethics procedure which is applied consistently.

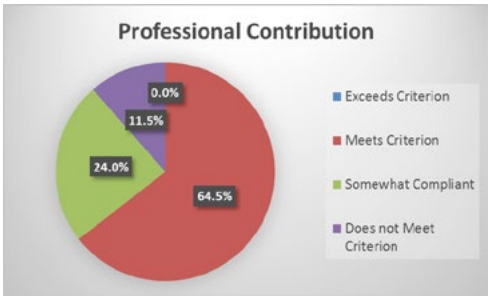


Fig. 5: Research Ethics

Fig. 6: Professional Contribution

Professional Contribution

The data represented in Fig. 6 show that 11.5% does not meet criterion while 24.0% are somewhat compliant with the threshold on professional contribution. However, 64.5% meet criterion while 0.0% exceed criterion. It is clear that most African

Universities help faculty members to publish in international journals, present at conferences, and take part atmeetings of professional organizations.

Research Incentives

The result obtained shows that 38.0% of the universities studied did not meet the criterion, 33.5% are somewhat compliant, 27.0% meet the criterion and 1.5% exceed the criterion as seen in Fig. 7. This shows that most universities in Africa are lagging in providing great research environments to incentivize research activities.

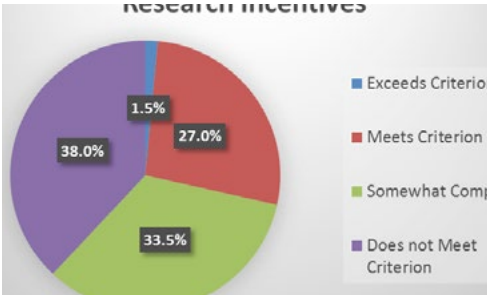


Fig. 7: Research Incentives

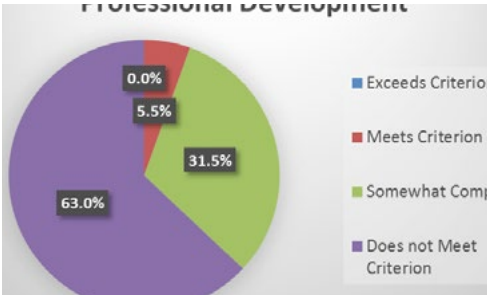


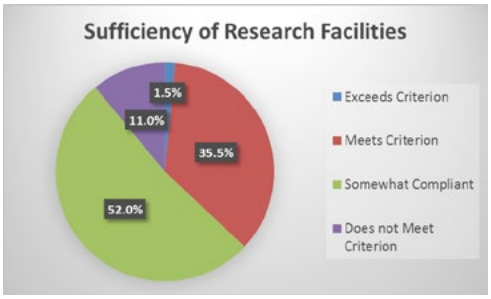
Fig. 8: Professional Development

Professional Development

On professional development, Fig. 8 shows that 63.0% of the universities studied do not meet the criterion, 31.5% are somewhat compliant, 5.5% meet the criterion while 0.0% exceeded the criterion. Hence, it is important that faculties are supported to inherently develop the knowledge and skills necessary to successfully undertake research such as good research ethics understanding, proper research methods, adequate grant writing, etc.

Student Research

The importance of student research cannot be overemphasized as it provides a bedrock for high qualityresearch. Our findings as represented, in Fig. 9, showed that 68.0% of the top universities in Africa meet the 'student research' criterion, 24.5% on the other hand are somewhat compliant, 6.5% do not meet the criterion and only 1.0% exceed the criterion. These results indicatethat most universities are performing well in involving their students in research, which will in turn affect the quality of their research.



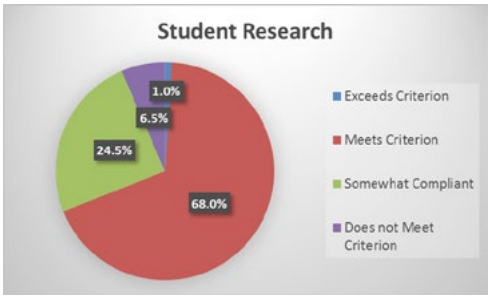


Fig. 9: Student Research

Fig. 10: Sufficiency of Research Facilities

Sufficiency of Research Facilities

The availability of facilities and equipment for research activities are necessary for any university aspiring to be one of the best in Africa and in the wider world. Fig. 10 shows that 52.0% of the universities studied are somewhat compliant to this parameter, 35.5% meet criterion, 11.0% do not meet criterion and 1.5% exceed criterion. Furthermore, it is observed that many of the selected university websites are somewhat compliant with the set parameters in the area of efficiency of research facilities. This implies that there is still a need for universities in Africa to prioritize the availability of research facilities and equipment to perform proper research activities. If we look at the average across the ten HEICAT parameters considered of the top 200 universities in Africa according to the webometrics ranking we can see that overall 38% of the parameters do not meet the criterion, and a further27% are only somewhat compliant. 34% do meet the criterion and 1% exceed it. As might be expected, if we lookonly at the top 100 institutoins then the situation improves a little with the figures being 28% not meeting the criterion, 28% somewhat compliant, and 42% meeting the criterion, and 2% exceeding it. The situtation is still however far from ideal. Even for the top 10 institutions, 25% of the 10 HEICAT criteria are either not met or are only somewhat compliant.

Overall for the top 200, looking at all 10 HEICAT parameters for insitutions, while 85% of institutions either meet or exceed the threshold for at least one criterion; 99% fall short (do not meet, or only somewhat compliant) in at least one criterion – there are only two institutions (1%) that meet or exceed all 10 HEICAT criteria.

DISCUSSION

Strategic Research Management (SRM)

SRM deals with the sense of direction with which an institution strategically and

collectively initiates a research management and administration vision. The result from the data analysis suggests that university management in Africa are not paying due attention to the development of policies in research management and administration. SRM lays the foundation upon which other parameters exist, and without it, all other parameters would not be sustainable.

Opportunity Scanning (OS)

In a related vein, OS seems deficient. The deficiency appears dependent on the improper footing of SRM.Where there is no focus on what is needed, opportunities about what is needed cannot be seen, considered and reaped. Policies and procedures pave the way for locating opportunities.

Research/Grant Management (RGM)

In addition, it is alarming to note that most universities do not have dedicated administrative offices to manage their research and grants systematically. If the operationalisation of grants and research is this unsupported, then the research nerve itself might be weak, slow and less productive. Whilea university without adequate administrative support for research would have one breakthrough, the others with administrative support might have had multipleadvancements. It is also the case that the lack of a research office makes collaborative research more difficult. Also, crucially a lack of RGM means that academic staff themselves must undertake these duties, reducing their time for research.

Research Dissemination (RD)

Unlike the three previous parameters earlier discussed, RD is comparatively very strong in the universities in Africa. It is not surprising that research dissemination via publications is very well developedbecause the universities base promotions on publications. Hence, the development of the means of ensuring that researches are published, not only for the academic/industrial communities, but for ease of moving from one academic grade to another. It is therefore imperative to note that if equal efforts are put on improving the other parameters, African Universities would likely experience enormous growth in RMA and hence research.

Research Ethics (RE)

RE is the quality assurance framework of research. It is clearthat documentary procedures to ensure and assure research ethics arenot obvious, hence the reason for its non-visibility on the websites of most of the considered African Universities. Wherever research ethics is consistently respected, and the policies applied in the conduct of any research, such research will withstand any international scrutiny

because it will be able to live up to the international best practices of global standard operating procedures. For RMA, monitoring of compliance with ethical practices is important both in the pre-award and post- award duties.

Professional Contribution (PC)

PC is the parameter that is hinged on professionalism in publications and participations at conferences and other professional gatherings. It is evident that one of the criteria for publication is that the publications must be in professional and reputable journal or other outlet, hence the compliance of most of the universities. Also, since conferences are means of professional networking, most faculty members endeavour to attend such conferences to garner networking opportunities for improving the knowledge base and opportunity scanning.

Research Incentives (RI)

RI concentrates on activating enabling environment for promoting research activities. One such factor is the creation of protected time. In many universities, lack of protected time is the impediment for adequate research activities because teaching and administrationconsume time. In addition, training and retraining becomes the responsibility of the individual faculty instead of that of the institution, hence all incentives to promote and accelerate research are non-available ornon-existent. Our data here show that incentives for the promotion of research is limited. Hence, research activities in African universities continue to lag. This is unlike the research tempo in the universities of the GlobalNorth where government, private organisations as well as individual philanthropists continue to provide incentives for research (Makoni, 2019).

Professional Development (PD)

PDhas similar training components as RI. If the faculty are supported to acquire necessary skills in grant writing, research methods, research ethics and research compliance, such support is categorised under the PD parameter. Looking through our data, PD is noticeably weak as most universities do not meet the criteria. The implication of lack of this professional development will prevent most faculty from attempting to secure international grants because of the lack of expertise for writing research grants and adequate research methodology, and compliance with research ethics. Hence, if this continues, most faculties in Africa will not be able to contest with their peers across the globe.

Students' Research (SR)

Students can be viewed as catalyst of research as their thought-provoking questions can lead to many research breakthroughs, and the additional effort enables a much

higher volume of research to be undertaken. SR in our data analysis indicates the integration of research into the curriculum of students at the undergraduate and postgraduate levels. If the research culture becomes a part of the students' formative habit, there is the assurance that the future leaders in research are being prepared. For the African universities, it appears they are mostly well supporting students' research which is a good foundation for future research endeavours, activities and management.

Sufficiency of Research Facilities (SRF)

The SRF section of the data analysis shows that about half the universities in Africa have enough research facilities to promote research and support their own research agenda. If facilities and infrastructures are lacking or inadequate, it is difficult for meaningful research to take place. For instance, where electricity is a challenge, it would be very difficult to do basic medical research because there will be insufficient power to preserve reagents and samples adequately. From this data, it is clearthere are plenty of scope for improvement of the facilities, as times goes on, to strengthen the support for research.

CONCLUSION

Giving attention to the parameters that do not meet the set criteria will lead to many benefits. Adequate RMA support academic faculty to executeground-breaking research in the Global North. In line with the suggestions of Ayyar and Jameel (2019) for India we propose that if the concept of RMA is properly transferred toand developed in Africa, it would help improve African research and researchers in African universities such that they can compete on a more equal footing with their peers in the Global North.

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ATA led the paper, SK contributed. Specifically, according to the CRediT descriptors: ATA conceived the study, developed the methodology, administered the project, coordinated the data collection, undertook the data analyses, and prepared the visualisation for and text of the manuscript. SK contributed to the conceptualization, undertook some data analyses, and critically reviewed and edited the manuscript.

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ACKNOWLEDGEMENTS

1. We specially acknowledge the immense and selfless volunteer support of our Research Assistant, Mr. Opeyemi Samuel Makinde, who worked relentlessly to provide all the support to make this research a success.
2. We acknowledge the advice and encouragement of the Select Committee on Global Affairs of the National Council of University Research Administrators, USA.

ISSN 2704-4858