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NCHE

EXCELLENCE, ACCESSIBILITY AND RELEVANCE

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The National Council for Higher Education
Plot M834, Kigobe Road, Kyambogo
P.O. Box 76, Kyambogo, Kampala, Uganda
Tel: +256-393-262-140/1
Fax: 256-393-262-145
Email: info@unche.or.ug
Website: www.unche.or.ug

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About the Journal

The Uganda Higher Education Review Journal of the National Council for Higher Education (NCHE) provides a visible outlet for definitive articles that discuss the theory, practice and policies relating to the role, development, management and improvement of higher education from a national, regional and international viewpoint. The journal provides a platform for scholars, researchers and higher education institutions to make a contribution to scholarly debate through the publication of quality peer-reviewed articles.

This journal is a product of the call for papers following the 3rd Annual Higher Education Conference (Virtual) organized by the National Council for Higher Education, held from 18 to 20 May 2021 at Makerere University Business School (MUBS) in Kampala, Uganda. The 3rd Annual Higher Education Conference was virtually conducted owing to the prevailing limitations on physical interaction because of the COVID-19 pandemic. The theme of the Conference was **"Adaptation to Current and Future Challenges for Higher Education under the COVID-19 Pandemic".**

The 3rd Annual Higher Education Conference aims at exploring ways and means of enhancing smart learning environments and technologies in view of the limited physical interactions at institutions of higher learning due to COVID-19.

The National Council for Higher Education, the organise organiser of the conference, was interested in papers that focused on:

- The ODeL context relevant to teaching and learning interventions.
- The impact of COVID-19 on the internationalisation of higher education, the cross- border movements of students.
- Effective pedagogical practices for online teaching.
- Higher education financing strategies for the attraction and retention of students.
- The policy and strategic frameworks for higher education recovery under COVID-19.
- Crisis-sensitive higher education planning and management.

Omvia Dennis Kaggwa
Planning Officer
National Council for Higher Education

Foreword

The *Uganda Higher Education Review* is the journal of the National Council for Higher Education, an autonomous and self-accounting agency that was established under the Universities and Other Tertiary Institutions Act, 2001 to regulate the provision of higher education in Uganda. The *Uganda Higher Education Review* is a peer-reviewed interdisciplinary journal dedicated to publishing high-quality scholarly research on various aspects of universities and tertiary education. This includes fostering wider understanding of higher education in Uganda and beyond.

The NCHE journal provides a platform for scholars, researchers and higher education institutions to make a contribution to scholarly debate through the publication of quality peer-reviewed articles with a focus on national and regional issues of higher education.

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Though a diverse range of contributions was considered, the journal gave special preference to conceptual and empirical writing that was relevant to the theme and understanding.

This journal is, therefore, committed to the publication of both experienced and early career researchers so its editorial policy pays overriding attention to helping contributors to reach the level of quality that is deemed fit for the publication through ensuring relevant, fair and penetrating reviews as well as timely relay of feedback to contributors.

Finally, I take this opportunity to thank the authors, staff and management of NCHE and all our stakeholders for their contribution to the journal.

Professor Okwakol J. Mary, PhD
Executive Director
National Council for Higher Education

Financial Strategies and Quality Assurance Implementation in Universities under the COVID-19 Pandemic

Moses Muhindo Kibalirwandi
kibalmoses@gmail.com

Adrian Rwekaza Mwesigye
arm@must.ac.ug

Mbarara University of Science and Technology

Abstract

Introduction/Purpose: Higher education financing strategies for the attraction and retention of students require "collective decision-making" during the COVID-19 pandemic. Quality assurance is a universal reform policy in higher education that encourages participatory leadership. COVID-19 has caused the temporary dismissal of some university staff. Collegiality in some universities is being eroded. The COVID-19 pandemic effects call for re-organisation and strengthening employees to enhance financial strategies as well as platforms to improve collegiality. Desk research utilising a dataset from an ongoing PhD research study on "staff participation in quality assurance implementation in Ugandan universities" has two objectives: 1) to explore causes of Ugandan universities ranking low on the African list of performing universities; and 2) to establish possible financial strategies for attracting and retaining students in Ugandan universities during the COVID-19 pandemic.

Methodology: Building on a multi-stakeholder quality assurance theory and adopting a discursive institutional perspective, the study employed a descriptive survey design, using both qualitative and quantitative approaches. University employees, both teaching and non-teaching, participated in the study.

Results: Empirical results confirm that causes of ranking low on the African list of performing universities may include, but is not limited to: low funding of research and publication, low morale of employees due to low remuneration or compensation of employees, job insecurity, and promotion in academic ranks being ineffective, and employee mobility. University collegiality is being eroded, and a link between industries and universities is missing. With the outbreak of the COVID-19 pandemic, university employees whose employment contracts were not permanent and pensionable were withdrawn. Parents lost businesses and students' sponsorship declined. As quality assurance requires normative standards for ensuring the quality of higher education, new strategies and standards need to be established. Generally, the five major criteria (teaching, research, citation, industrial income, and international outlook) of university web ranking have not been given adequate attention before COVID-19. Staff participation and QA policy implementation were positively correlated, where r=0.685; r2 = 0.469, std. error established to be 0.39132, f =123.006, t=5.938, and p=0.000< 0.001. The possible financial strategies were identified as increasing university revenue, considering "revenue side model" rather than "cost side model".

Conclusion: This article contributes to a theoretical debate that employee participation in decision-making towards financial strategies may increase university enrolment and the "throughput" of students. Extending student loan schemes and increasing education-technology enablers with a well-defined "credit policy" and engaging students and staff in productive research may avert the detrimental effects of COVID-19 on higher education institutions. Reform in university education may forcefully be hastened due to the effects and fear of the COVID-19 pandemic. These financial strategies will enable universities to attract and retain students up to completion time.

Keywords: Quality assurance, students' loan scheme, financial autonomy, effects of COVID-19.

Introduction

Quality assurance policy is causing a paradigm shift in the management and administration of Ugandan universities (Kibalirwandi, 2020). Research has shown that for public policy to succeed, policy knowledge, negotiation, empowerment, and perceived service delivery are major constructs for implementation (Kibalirwandi, Mwesigye, & Akena, 2018). A culture of continuous improvement in higher education quality is a sine quo non since students are global due to the high availability of information technology

(Kibalirwandi, 2020). The administrative structures of most Ugandan universities did not reflect the quality assurance office on the organogram before 2018. Failure to allocate QA units on organograms resulted in a mismatch and mystification in administrative roles that caused a clash of roles. Ugandan universities would borrow "a leaf" from Makerere University and Bologna University in establishing their institutional organograms (Makerere, 2007; Bologna University, 2020). In 2018, Kyambogo University included the QA directorate under the Vice-Chancellor (Dereck, 2018). Internal quality assurance assessment has not been given adequate attention where enablers, such as computers and an internet connection, have not been adequately improved in most universities. As a result, some students do not have adequate skills to enable them to utilise the internet for sharing knowledge in the absence of open classes during the COVID-19 pandemic. Few universities have well-developed e-libraries, repositories, and Zoom platforms. The reluctance of institutional leaders to implement government policy on ICT awareness may be associated with inadequate accessibility of both software and hardware or what it takes to utilise ICT in the remote countryside where rural electrification has not been achieved. Educators/lecturers may not have been actively engaged in the technology revolution. Smartphones and laptops are not personalised yet by most university and other tertiary employees as well as learners at different levels of education. In universities and other tertiary institutions, mobile telephone handsets can be utilised as good learning aids to help students amidst the COVID-19 pandemic. Instructors can share information about e-learning using mobile phones or smartphones (Ayub, 2018; *Daily Monitor*, 2015; Mugisa, 2013; Tumwesige, 2020). However, many parents still live below the poverty line in Uganda so they cannot afford to give a handset (phone or radio) to their child in tertiary institutions. The policymakers in Uganda and any other developing country would take the COVID-19 outbreak as an eye-opener that calls for immediate decision-making. Multi-stakeholders need to brainstorm and come up with a long-term decision on digital literacy skills and knowledge to facilitate education at all levels (Tumwesige, 2020).

To sustain the debate on financial strategy and quality assurance implementation, ideas and interests are the substantive content of the discursive perspective (Schmidt, 2008). It is accepted that discursive institutionalism (DI) results from exogenous and endogenous ideas of different actors across states (Wahlstrom & Sundberg, 2017). Policies, programmes and philosophies are different levels of ideas (Schmidt, 2016). There are two forms of the discursive perspective: sharing ideas and personal interests at work, which serve as catalysts for policy and institutional change. Making an explicit distinction between ideas and vested interests is important (Mukand & Rodrik, 2016). Taking examples from other parts of the world, the quality of education has been improved through access to information technology (Tumwesige, 2020). As mentioned earlier, decision-making motivates staff to both formulate and implement policy (Kibalirwandi, 2021), and participating in financial strategic planning for institutions increases a sense of ownership (Kibalirwandi, Mwesigye, & Maate, 2020). Both employees and students are seeking visas to flee most African countries to seek 'fat' jobs and prestigious institutions of higher learning (Kibalirwandi, & Mwesigye, 2018). The reason for the inclination on the part of intellectuals to escape has not been explored by most university

administrators and politicians. Universities within African are in a better position to train their African students (human resource) in the African way of handling problems within Africa (Mamdani, 2016). African problems are unique and cannot be solved using Western models (Woldegiorgis & Doevenspeck, 2013). There is need to rethink how human capital can be improved using blended learning for quality higher education which is desirable and timely (Cher-Ping & Tianchong, 2016).

In Uganda, a TDMS (Teacher Development Management System) programme (1993 – 2000) provided on-job training to teachers. It was supported by the Ministry of Education, in collaboration with USAID, The Netherlands and Irish AID (Francis, 1999). The programme was facilitated on 10 residential days where student teachers (in-service) were hosted for face-to-face learning and they did examinations within those ten days. The TDMS was perfectly handled at Canon Apollo Core Primary Teachers' College (PTC) and 17 other core PTCs. This model can still be applied where printed e-copies of discipline content is developed for learners across primary, secondary, and tertiary levels. At primary level, one day per week could be allocated for the training; at secondary, four days per month; and at university, five days per month. The training would involve face-to-face interaction blended with e-copies and hard copies for those without smartphones.

While other developing countries (Sierra Leone, Jamaica, and India) are worried about how to increase access to higher education institutions (Daniel, 2006), Ugandan universities largely think of how students can be financed to graduate within a stipulated period. The "throughput" of privately sponsored students tends to take more years than the stipulated period for each study cycle – the undergraduate (bachelors), masters and doctoral cycles (Reinalda, 2011; Kibalirwandi, Mwesigye, & Maate, 2020). The cause of delayed graduation and attrition of students in Ugandan universities is greatly associated with financial constraints. In the US, Germany and United Kingdom, universities are considered to be technology transfer offices (TTOs) targeted at the community and industries (Sugardson, 2013). The core activities of any university are: teaching, research and community outreach, and this calls for the third mission of universities, namely transforming society into a scientific or knowledge economy (Reiners, 2014; IUCEA, 2010; Kibalirwandi, 2021).

In developed countries, it has been reported that working digitally to minimise disruption to daily operations has also led to enormous anxiety among student populations, and meeting students' expectations has also become significantly more difficult (Gamage, 2020). Some institutions have been having lecturers who partially teach by downloading notes from the internet and giving handouts to students (Kibalirwandi, 2021). The examination and grading could have 50% as the pass mark, that is a "C" grade, and below 50%, that would mean failing, that is an "F" grade. There is a need to negotiate with a quality assurance agency to lower the grading system temporarily (Gamage, 2020) and to lower the accreditation and assessment measures (Europe, 2021). These are some of the World Bank's 10 key recommendations for

immediate action during this COVID-19 pandemic. Some may apply in Uganda and others may not immediately apply (Europe, 2021).

We may agree that universities need to sustain students' success through coaching. But who is going to coach students? As mentioned in the ongoing PhD research study, employees complain about the low pay which causes low morale, poor communication feedback from top administrators, and having no job security (Kibalirwandi, 2021a). Research has shown that 40% of managers and 34% of employees self-reported that workplace stress is higher than personal stress (LeMaster, 2021a). It is further suggested that the success of students who learn in institutions with high turnovers is hampered. Therefore, the action taken by most universities to downsize staff during the COVID-19 pandemic is detrimental to students' success (Kibalirwandi, 2021). Managers should patiently work with employees to suggest solutions to the current crisis but not base their actions on the "*cost side revenue model*". New financial strategies are desperately needed to support students who may be "left high and dry" in their attempt to raise funds for higher education. The government should be encouraged to support student loan schemes at different universities. President Yoweri Kaguta Museveni has stressed that during the COVID-19 pandemic, the number of industries/manufactures of sanitisers increased in Uganda. Income and employment opportunities have thus increased in the "pockets" of the "innovators".

Government funding to higher education is the most preferable form of funding (Gebreyes, n.d.). He further identifies university revenue sources as regional and central governments, student tuition fees, campus service, and project funds from (bilateral and multilateral) donors. Any university that does not get government funding or donations from the international community may fail and close due to the effect of COVID-19. In the United State of America, public education institutions get funding from local, state and federal governments (Skinner, 2019). In Germany, education is freely funded by federal states (*Länder*), where their current expenditure on research and teaching (staff salaries, materials and operating costs) are the responsibility of federal states (Hartwig, 2006). Hartwig further asserts that large investments are funded by *Bund* and *Länder* (Hartwig, 2006). Local governments (in the USA) receive property tax, while states receive personal and corporate taxes, retail sales tax, and a variety of "excise" taxes on items, such as tobacco and alcoholic beverages (Skinner, 2019).

In Uganda, local governments also include primary and secondary schools in their budgets. Furthermore, districts that have universities or other tertiary institutions include them in the budget. However, universities and other tertiary institutions require huge amounts of money for sustainability. The challenges caused by the COVID-19 pandemic and its aftermath are mostly going to be faced by privately sponsored higher education students.

The financial committee may be known as "financial administrators" in universities and other tertiary institutions. The effects of the COVID-19 pandemic, that have seen many students drop out of schools, colleges and universities due to the collapse of productive businesses owned by parents, and loss of employment for those teachers, drivers, accountants and so on

that were not employed by the central government. The COVID-19 pandemic crisis must be addressed using a multi-stakeholder quality assurance theory. Different sectors are interlinked for purposes of promoting the quality of university education, hence the production of desirable human resources. Quality university education is an economic strategic plan aimed at shifting from low-income status to middle-income status. Financial administrators include, but are not limited to, the Vice-Chancellor, Deputy Vice-Chancellors, and Deans of Faculties. Financial administrators must consult and communicate with respective stakeholders. Bottom-up decision-making in financial strategic planning will succeed during the COVID-19 pandemic and thereafter.

Research Questions

1. What causes Ugandan universities to rank low on the African list of performing universities on the continent?
2. What are the possible financial strategies to be applied in attracting and retaining students up to graduation during the COVID-19 pandemic in Uganda?

Hypothesis

$H_{o:}$ There is no significant relationship with quality assurance policy implementation and financial strategic planning during the COVID-19 pandemic at Ugandan universities.

Rationale/Justification

While universities in Uganda have been appearing low on the African list of performing universities when web ranked following the five major criteria – teaching, research, citation, reputation or knowledge transfer or industry income, and international outlook or networking or collaboration – the COVID-19 pandemic crisis has exacerbated the situation that when the African Quality Rating Mechanism (AQRM) is applied, many of the universities may not meet the required minimum standards.

Sharing information with university administrators and policymakers may help the discursive nature of policy analysis along. After all, the provision of education is a duty of government (Uganda Constitution, 1995; Kibalirwandi, Mwesigye, & Maate, 2020). Private providers of education are partners in service under government supervision. The return on education that is non-revenue income is human resources development for economic development that can be assessed at the macro-level.

Methodology

The study employed a descriptive survey design using both qualitative and quantitative approaches which were anticipated to provide explicit diverse positions as proposed by Creswell (2009) and Morse (2003). The study involved interactive data collection using both quantitative and qualitative approaches, hence QUAN+QUAL is recommended. Interviews, a self-administered questionnaire, an observation checklist, text analysis of QA reports, and observing internet utilisation constituted the dataset for the ongoing PhD research. These

methods fell within the limits of qualitative and quantitative methods. It involves engaging staff, both teaching and non-teaching. Simple random sampling was used for teaching staff and purposive sampling for non-teaching staff. The total number of participants was 182, of whom 142 (77.5%) responded to the questionnaire, and 41 (22.5%) participants used the structured interview guide. The respondents were drawn from six Ugandan universities.

Literature Review

While some universities, especially private ones, had been having a high labour turnover before COVID-19, the situation has been exacerbated by the COVID-19 pandemic (Kibalirwandi & Mwesigye, 2018). For students to succeed, the staff work-life balance, communication, competitive pay, flexibility and employee development (training) would be considered important by employers (LeMaster, 2021). The COVID-19 pandemic has led to many "adjunct" staff being laid off, and methods of teaching are now "passive", where a few lecturers download materials from the Internet to students' notebooks without proper scrutiny to establish the relevance of the knowledge (content) to Ugandan students. As mentioned earlier, communication from managers to employees, competitive pay, work-life balance, flexibility in time and workload, and staff development or training for professional growth all determine employee morale and loyalty, and the "retention" of staff and student enrolment (LeMaster, 2021; Kibalirwandi & Mwesigye, 2018). The staff interact directly with learners and, by so doing, they encourage new students to enrol. As some staff members are laid off, some students are financially incapacitated through their parents or sponsors failing to run their businesses due to the lockdown, and enrolment at some universities will sharply drop.

The global COVID-19 pandemic has caused management challenges in businesses, the education sector, and government institutions. Scholarly articles have been written about the coaching of students yet the financial aspect has not been dealt with. The reason may only be guessed at because many of the articles are written drawing on knowledge economies where sponsorship may not be an issue, unlike what happens in Ugandan universities. The content of such articles may not wholly be consumed by Africans whose economies are severely affected by this pandemic crisis. Particularly in Uganda, students do not have personal computers, money to pay for online education courses, smartphones that can access the internet and information technology (IT) knowledge, or have low in virtual learning skills. It has been reported that 80% of school- age children live in rural areas, and this means that acquiring IT equipment remains a challenge for them during this COVID-19 pandemic (Fanelli, Cajuste, Cetta, & Emmanuel, 2020).

Financial strategies may help in attracting and retaining students in higher education institutions during the pandemic and after. These strategies require staff and students to be emotionally coached to prepare them for continued higher education. Staff engagement in saving for investment in human resource production and capital accumulation management is important for national development. This will require institutions to establish workers' savings schemes that will retain salary percentages to be used in facilitating student loan

schemes. This can be seen from the revenue side model as opposed to the cost side model (Frondizi, 2019; Kibalirwandi, 2021). Kerr's (1963) idea suggests that funding university education should come from: 1) a steady public funding institution (government); and 2) research institutions/foundations (Frondizi, 2019; Ostling, 2017; Reiners, 2014). Knowledge economies view universities as industries that create wealth from knowledge (Jongbloed, 2015). It is further believed that government, business, and industries utilise universities for consultancy. Staff participation in research and teaching would attract funding from both sources, hence increasing the revenue side model without emphasising the cost side model (Wabwire, 2011; Kibalirwandi, Mwesigye, & Maate, 2020). Kerr further remarks that an American university president (Vice-Chancellor) should be a friend to students, a colleague to staff, a good fellow with alumni, a sound administrator with the board of trustees, a good speaker with the public, an astute bargainer with foundations and federal agencies, a politician with state legislatures, a friend with industries, labour and agriculture, a persuasive diplomat with donors, a champion of education, generally a spokesperson to the press (Maassen & Muller, 2012 quoting Kerr, 1963).

In relation to objective one, there is a missing link between universities, industries, communities, and government ministries in Uganda (Jongbloed, 2015). The research agenda is never shared between government ministries and universities; hence, little is done in research (Kibalirwandi, 2021, quoting Atwine, 2018). The third mission of universities is community engagement, which is often interpreted in terms of the dimension of technology transfer and situated in the discourse about entrepreneurial university engagement (Jongbloed, 2015). In this discourse, emphasis is heavily placed on the economic and technical support function of the university (Jongbloed, 2015). The core activities of a university, as mentioned earlier, namely teaching, research and community outreach, seem to be missing from contemporary interpretation in Uganda. Research and teaching combined are unique to universities (Kibalirwandi, 2021; Reiner, 2014). Modern German universities, whose operations are based on the Humboldt concept that is associated with combining teaching and research, epitomise performing universities and Uganda can benchmark against these universities (Ostling, 2017).

The research volumes of most universities are never up to 500 published articles and book chapters in peer-reviewed journals. This leads to universities being ranked low on the African list of performing universities (Kibalirwandi & Mwesigye, 2018; Times Higher Education, 2015). Teaching quality is still low because only 10% of the total university staff in the country hold PhD qualifications and Makerere University alone takes 69% of the qualified PhD staff (Kasozi, 2016; Kibalirwandi, 2021). One of the reasons for failure to have many PhD staff was elaborated in Kibalirwandi's (2021) draft dissertation, i.e. the high cost of producing a doctoral student, which is an approximate value of $14,000. Self-sponsorship is not possible since 87.2% of employees in most universities earn an annual gross salary of less than $10,000 (Kibalirwandi, Mwesigye, & Maate, 2020). Other causes are age, family responsibility, fewer opportunities to get study leave, maturity and major financial constraints (Botha, 2016). A

few performing universities, such as Makerere, Mbarara University and Uganda Martyrs University, have got international networks and collaborations (Kibalirwandi, 2021). When it comes to the COVID-19 effect, then few or none may maintain the quality of higher education.

Let us now turn to objective two, which relates to financial strategies where staff and management will equally participate to increase the gross enrolment ratio (GER) for Uganda, to attract learners to enrol and remain at university and other tertiary institutions, and to reduce the attrition rate, which is estimated at 50% of enrolled student in the postgraduate cycle (Kibalirwandi, Mwesigye, & Maate, 2020). However, the attrition level in the undergraduate cycle is not explicitly mentioned. However, LeMaster (2021) argues that 50% of undergraduate students enrolled do not complete their studies. UNESCO's press release (2021) shows that 53% of proprietors of private schools may not afford to re-open in the face of the Government of Uganda's emphasis on adherence to standard operation procedures (SOPs). Public funding per capita of higher education in developing countries has been US$ 48 and in developed countries, US$ 8,501 per learner. This explains why motivation is low among university lecturers in Uganda (UNICEF, 2021). As COVID-19 continues episodic lockdowns in Uganda, few of the learners may return to universities; hence, attrition may be exceedingly great at different levels of the study cycle.

Kerr suggests that university education is funded by two sources, namely from a well-established public fund (government), and from research institutions, where staff and learners are engaged in research projects (Sugardson, 2013). The Mbarara University of Science and Technology community nicknamed Professor Celestino Obua, the university's Vice=Chancellor, as a crusader because he mobilises funds from within and without Uganda to facilitate research and teaching (MUST, 2017). The Vice-Chancellor is thus described in terms with which Kerr described a Vice-Chancellor in 1963 (Maassen & Muller, 2012).

Let us critically observe the history of modern universities' evolution, taking examples from the USA, Canada, UK, Italy, and Germany (Sugardson, 2013). The German government established the Humboldt model that universities could not separately exist without responsibility for social change. The Humboldt model of a modern university became prominent in the 1930s. Research and teaching, community outreach as well as social responsibility were emphasised. The government increased funding to all universities, research institutes, and tertiary institutions. Basing on this model, German universities, state-funded and research-heavy, represented a threat to Oxford and Cambridge universities in the UK (Kerr, 1982; Sugardson, 2013; Ostling, 2017).

The multiversity model of the USA, as discussed by Kerr (1963), finds its roots in the Humboldt model. The Humboldt model was transferred to the US and the seed of the US multiversity model was initially planted in 1876 as John Hopkins University was established. John Hopkins University was established as a research and teaching institution (Sugardson, 2013). The Anglo-American university model (multiversity) was prescribed as comprising many people, many things, and many activities that appear to be conflicting at some point,

but that has the aim of increasing productivity, knowledge transfer, technology, economic development, and research for industries. For instance, the Wisconsin Alumni Research Foundation (WARF), a well-known research foundation in the world, was launched in 1924 on the heels of breakthrough by a well-known researcher, Harry Steenbock, who discovered a process of fortifying food products by adding vitamin D to treat rickets (Sugardson, 2013). As the WARF was registered as an independent organisation supported by alumni, many of the alumni contributed hundreds of dollars to run the foundation as "friends of the university". Thus WARF was able to sponsor further research at the university.

Likewise, alumni of Ugandan universities can be mobilised to establish research foundations to help with raising funds for research and to sponsor students' research at the university and, hence, linking universities and the business community, especially industries. An example would be fattening cattle and other animals at Mbarara University of Science and Technology, which can be revitalised by the alumni; and the production of albino rats, the extraction of insulin, and the extraction of observable stitches. All these can be done with the help of alumni of the university. Laboratories can be established under different disciplines at universities for research. Also, student loan schemes can be administered by the alumni and staff associations of the universities. The Ministry of Finance and NIRA can support student loan schemes with national registration records.

The salient objective in this article is budgeting in higher education and attracting student enrolment through alumni and a staff association (UASA – university alumni staff association). A university budget should be clear and inclusive to be realistic (Guthrie, Griffiths, & Maron, 2008). For the budget to be realistic and sustainable, a revenue model should be applied other than the cost side revenue model. The budget is a resource mobilisation tool for institutions that Vice-Chancellors can utilise in the crusade to support institutional performance. Long-term fiscal projection as part of institutional budget reform has been used in countries, such as the United States of America, The Netherlands, Norway and the United Kingdom; and more have benchmarked and joined in the reform (Anderson & Sheppard, 2009). A strategic plan for three, five or 10 years should show details of projections. The annual budget should also show the good intentions of an institution so that staff work systematically towards set goals. As mentioned earlier, most universities now present a three-year strategic plan basing on a national development plan in their respective countries (Kibalirwandi, 2021). Fiscal sustainability in its narrowest sense focuses on institutional solvency measured using either institutional liabilities (gross or net) and/or institutional net worth (Anderson & Sheppard, 2009). For fiscal sustainability to be achieved, the value of future budget surpluses must exceed the present future budget deficit. For instance, an assumption may be made regarding the sustainability of a students' loan scheme on the basis of life expectancy being higher than 60 years, and the national identification registration authority, financial cards and credit cards being effectively used in Uganda. Once an assumption is clearly understood, a fiscal projection may be sustainable.

A few budget models may help financial administrators to understand budget models, incremental budget models, zero-based budget models, performance-based budget models, activity-based budget models, and responsibility-centred management (RCM) budget models (Auerbach & Edmonds, 2013). There is no single budget model that satisfies the institutional budgeting process but hybrid budgeting models are used. In Uganda, Wabwire (2011) expounds on two revenue models used by university budgets, namely the revenue side income model and the cost side revenue model. The revenue side model encourages staff and management to think of increasing the sources of revenue but maintains employees, while the cost side revenue model encourages top management to reduce costs either by reducing employees and maintain the same revenue sources.

Budgeting based on revenue models will either be skewed to the centralised budgeting or decentralised budget process. For instance, incremental budgeting models are a more centralised budgeting process than a decentralised process. The five budgeting models can be graphically explained in the appendix (Auerbach & Edmonds, 2013). For educational institutions, performance-based, activity-based and responsibility-centred management budget models would be applied during this COVID-19 pandemic when basing on the revenue side income model. The revenue side income model requires participatory decision-making that involves centralised planning, according to faculties and departments. Budget models achieve the intended revenue-generating strategies, cost reduction strategies, and quality improvement (Auerbach & Edmonds, 2013). During this COVID-19 pandemic crisis, government appropriations to universities should be unconditionally provided to both private and public universities since government revenues come from public taxes, natural resources, and incomes.

Alstete (2014) explicitly explains how original historical universities, such as Bologna University that started in 1088, used to get their revenues from tuition fees, philanthropy, and government or state appropriations. The *Magna Charta Universitatum* was signed after 900 years in 1988. A *Charta* is of the greatest importance, given that universities' independence and autonomy ensure that higher education and research systems are continuously adapted to changing needs, society's demands and advances in scientific knowledge (*Magna Charta Universitatum*, 1988). The Government of Uganda ought to include all universities and tertiary institutions in the national budget since, like any other non-revenue generating activity, the education system should be recognised. This will help universities to have three major revenue income sources, namely the government, tuition fees, and research institutions or donors. The government appropriations (capitation grants) will enable universities to meet basic expenses and research expenses. Tuition fees and philanthropy incomes can finance 75% of unit instruction, and 25% of unit enrolment. The government appropriation can supplement unit instruction by 25% while 75% of the government appropriation will meet the needs of support units as budget administrators may allocate (Auerbach & Edmonds, 2013). Faculties will embrace financial strategies designed to increase revenue which they will benefit from

because 75% will come back to the faculty to cater for salaries and other expenses. The students taking course units from other faculties will make such faculties earn 25% from their mother faculty.

If at all possible, during the COVID-19 pandemic, universities should attract and retain students up to graduation using the following:

1. Request the government to include all universities and other tertiary institutions in the national budget. This will help universities and other tertiary institutions to get government appropriations that will support units by 75% budget. The students' tuition fees will support 75% of the budgets of instruction units, while 25% of the tuition fee will go to enrolment units (Auerbach & Edmonds, 2009).
2. Increase revenue side income and the use of hybrid budgeting models that will support operations based on the strategic plan for long-term fiscal sustainability budgeting.
3. Scale up collaboration with alumni to establish alumni research foundations to fund research and sponsorship for some students. Alternatively, all professors should be encouraged to establish research laboratories that can employ some alumni and junior lecturers to strengthen the link between universities and the business community.

Suggestions 2 and 3 above reflect short-term plans but what is long-term is for the government to take up higher education funding in cases 2 and 3.

Multi-stakeholders' Quality Assurance Theory

The demand for quality assurance implementation is global yet the unprecedented effects of the COVID-19 pandemic are hindering quality control in most universities. The multi-stakeholder quality assurance theory is a managerial theory of organisation that emphasises participatory approach and a culture of continuous quality improvement (Kibalirwandi, 2021). Stakeholders are persons or groups of people whose actions can directly or indirectly influence the day-to-day operation of the firm (Friedman & Miles, 2006). Stakeholders are those groups without whose support the organisation would cease to exist and these may be identified from among community members, both local and global, donors, suppliers, owners or investors, employees, government, and others (Friedman & Miles, 2006; Fontaine, Haarman, & Schmid, 2006). The multi-stakeholder quality assurance theory is formulated based on the four constructs: knowledge, negotiation, empowerment, and perceived service delivery (Kibalirwandi, Mwesigye, & Akena, 2018). The constructs can precisely be explained as knowledge of the proposed policy, negotiation between policymakers and policy implementers, empowerment of policy implementers with resources (both human and material), and ongoing assessment of service delivery, where internal customers become employees and external customers. Employees' assessment (IQA) of service delivery is appropriate since they purchase institutional products after being paid. The discrepancy that exists between the top management and the staff's perception and expectation of quality service limits improvement of quality to customers' satisfaction (Shahin & Janatyan, 2011). Management reform is where monitoring and evaluation have been focusing on both the financial and non-

financial achievement of complex institutions, such as the public sector and higher education institutions.

During data collection, it was discovered that most universities in Uganda have remained "ivory towers" without networking with potential stakeholders that would contribute to continuous quality improvement (Kibalirwandi, 2021). The stakeholders in education are: learners, teachers, parents or sponsors, the government, non-governmental organisations, the local and international community (IUCEA, 2010).

Results

Table 1: Biographical data of 182 research participants

Variable	Category	Frequency	Percentage (%)
Gender	Male	105	57.6
	Female	77	42.4
Age	Below 30 years	39	21.4
	Between 31-50 years	109	59.9
	51 years and above	34	18.7
Academic level	BA/BS	28	15.4
	MA/MS	77	42.3
	PhD candidates	39	21.4
	PhD holders	34	18.9
	Post-doctoral fellows	04	2.2
Professional ranks	Professors	06	3.3
	Associate professors	09	4.9
	Senior lecturers	32	17.6
	Lecturers	92	50.6
	Teaching assistants	20	10.9
	Non-teaching staff	23	12.6
Years of experience	Between 3-7 years	66	46.8
	Between 8-15 years	52	36.9
	Above 16 years	22	15.6
Annual gross salary	Below 12 M. UGX. or US$ 3,334	47	33.3
	Between UGX 12 & 24 M or 3,334-6666	53	37.6
	Between UGX 25& 36 M or $6667-10,000	20	14.2
	Between UGX 37& 48 M; $10,001-13,333	10	7.1
	Above 50 M or US$ 13,334	8	5.7
Employees' level of sensitisation on QA policy	Below 25%	20	14.2
	Between 26-50%	45	31.9
	Between 51-75%	51	36.2
	Between 76-100%	12	8.5
	Not aware of QA sensitization	13	9.2

Source Kibalirwandi, (2021): A "dataset" of ongoing PhD reference SS-4248 of Uganda National Council of Science (UNCST)

Critical analysis of Table 1 above

Employees that earn less than US$10,000 as annual gross salary hold 87.2% of the positions, while 21.1% of the employees who were accessible to the researchers were PhD holders.

Regression: Means of staff participation (MSTP) and means of quality assurance policy implementation (MQAIM).

Source Kibalirwandi, (2021): A "dataset" of ongoing PhD reference SS-4248 of Uganda National Council of Science (UNCST)

Source Kibalirwandi, (2021): "a data set" of ongoing PhD reference SS-4248 of Uganda National Council of Science (UNCST).

Critical analysis of Table 1 above

Employees that earn less than US$10,000 as annual gross salary hold 87.2%, while 21.1% of employees are accessible to researchers were PhD qualified employees.

Regression: Means of staff participation (MSTP) and Means of Quality assurance policy implementation (MQAIM).

Source Kibalirwandi, (2021): "a data set" of ongoing PhD reference SS-4248 of Uganda National Council of Science (UNCST)

Critical analysis of Table 2

Table 2: Staff participation in quality assurance implementation in Ugandan universities

Constructs	R	R squared	Adjusted R square	Std error of estimate	remark
Knowledge			.569		Significant
Negotiation			.546		Significant
Empowerment	.538	.290	.274	.35586	Averagely significant
Perceived service delivery	.887	.787	.779	.25145	Significant
Overall model staff participation and QA implementation	.685	.489	.466	.39132	Significant

- Knowledge of the policy is significantly and positively correlated with policy implementation success in institutions of higher learning in Uganda.
- Negotiation among policy actors on how benefits will accrue with each party is significantly correlated to policy implementation.
- Empowerment of policy actors with resources, both material and human, is significantly correlated but not as important as perceived service delivery, policy and negotiation.
- Perceived service delivery as measured from staff within the firm or organisation reveals customer satisfaction and it is significantly important since internal customers purchase service from the firm when paid.

Discussion of the results in relationship to COVID-19 and QA implementation

COVID-19 requires policymakers to use short-term and long-term solutions basing on both normative and cognitive decisions (Schmidt, 2016). Discursive content of ideas is not external rule-following but internal ideas of how institutions should operate and exist. Staff participation in quality assurance implementation is significantly important for each institution of higher learning. If any university is to continue existing during this world crisis brought about by the COVID-19 pandemic and unpredictable financial capability of students' parents and sponsors, then stakeholders must team up for solutions. Before the pandemic, the gross enrolment ratio was marked 4.1% while, on average for Africa, it is 5% as compared to East Asia and the Pacific, which is 17.2% (Wabwire, 2011). The GER shows a lag in economic development for the country. The knowledge economic index, as established by the World Bank, ranges from 10.00 to 0.00 and reveals that Kenya, Tanzania and Uganda rank less than 3.00 (Wabwire, 2011, quoting Kasozi, 2009).

The results show that the success of a policy depends on staff participation in implementation, and the policy formulation process remains a foundation for implementation. Staff participation positively correlates with implementation, where r=.685, std =0.391, f=123.006 and t=5.938, P=0.000, as reflected in Table 2 above (Kibalirwandi, 2021). In matters of establishing workable solutions to keep universities existing during the COVID-19 pandemic, participatory decision-making by staff and employers is required. Participatory staff engagement may be enhanced by coaching during this pandemic for ideological orientation. Research has shown that most Deans of Faculties in private universities lead staff in decision-making by coercive means (Atwebembeire, 2018; Kibalirwandi, 2021). This management style yields little success and no impact is observable in the long run. This explains why universities are graduating students in Uganda but web ranking lists the universities low (Times Higher Education, 2014). Kerr's (1963) argument, as presented earlier, remains important for consideration.

While universities have been paying employees a gross annual salary of less than US$10,000 in Uganda, during the COVID-19 pandemic, 50% of the employees that were earning the said annual gross salary have been laid off, as shown in Table 1 (Kibalirwandi, 2021). This shows that, even as negligible research output was already being published pre-COVID, less output or even nothing may be published during the COVID-19 pandemic. All these happenings are lowering the quality of higher education in Uganda.

Core university activities being teaching, research, and community outreach (IUCEA, 2010; Kibalirwandi, 2021), the major criteria for web ranking are quality of teachers (how well university staff are qualified, how best they participate in the teaching-learning process), research (what publication volume is achieved in five years), citation (what impact the research volume has in the world of knowledge), industry income or transfer of knowledge, and international outlook (how attractive the university network is and how many international staff and students are) (Kibalirwandi, 2021). Teaching, research, citation, knowledge sharing and international networking all require staff participation; hence, staff engagement is inevitable in university and other tertiary governance.

The short-term solution to the process of retaining university students and helping them to complete in time all bounces back to the university financial committee. It is better to allow students to study, graduate and retain their original academic documents on terms that students sign under the "students' loan scheme". Students and parents should sign up on to loan schemes with universities with support from the central government. Students who are paying tuition fees can be given a discount and the portion of fees that was not paid may be charged interest at the time the student clears for graduation.

The long-term solutions to improving the rate of retaining and attracting students to universities and other tertiary institutions in Uganda are timely. As earlier mentioned, government per capita expenditure on university and other tertiary institutions in developing countries is US$ 48 per year, while in developed countries per capita expenditure is US$ 8,501 per learner. Annual tuition and functional fees paid by a private day student at Bugema University, Mbarara University of Science and Technology, Makerere University, and Kampala International University average UGX 1,920,500 per semester or UGX 3,841,000 or US$ 1,066.9 annually (see fees structures of 2021/2022 on websites). When this is compared with the per capita expenditure of developed countries, the suggestion that government should take it upon itself to pay for learners from primary school to undergraduate level is worth considering. The purpose is to ensure access to quality education and the continued existence of current universities.

In Germany, for example, education is funded by *Länder* (federal states). Germany has sixteen *Länder*, including Baden-Wurttemberg, Bayern, Nordrhein-Westfalen, and the city state of Berlin (Hartwig, 2006). Universities are catered for under the *Länder*'s budgets. German universities have research foundations that employ very many young academics and lucrative research contracts are won (OECD Germany, 2020).

In comparison to Germany, in Uganda professors have largely not embraced research. They are more into teaching rather than combining both teaching and research. When research and teaching are combined, new products are brought onto the market. Alternatively, the government can appropriate funds from taxes and the proceeds from the sales of minerals for education. Ugandan universities have almost 183,084 students (Achan, 2020). Other tertiary institutions, such as technical and vocational education and training institutions, have about

80,000 students (Hassan, 2020). These add up to almost 300,000 students. Fairly realistic per capita expenditure would be US$1,066.9. That is, annual expenditure on higher education would be $3,200.7 million. These expenses can easily be met by student loan schemes and the government. This strategy would see more students gaining access to education. As mentioned before, the GER is still low yet Vision 2040 requires a skilled person to set up for production.

Staff participation in quality assurance implementation accounts for policy success where r=0.685 (Kibalirwandi, 2021). Institutions should be encouraged to use learning management systems (LMS), such as Moodle.net, canvas, Zoom, etc. There are seven key areas that evaluations focus on: financial, staff development, technology infrastructure, maintenance and cleaning students' facilities, information channels to enhance feedback to both staff and students, and information to stakeholders and the general public (Lemoine & Richardson, 2020; AQRM, 2013; Kibalirwandi, 2021). Improved quality of university education will attract and boosts the retention of students and university employees.

Finally, engaging university staff in financial strategic planning is another method to retain and attract more students. The higher education budgeting process should be realistic enough to include income sources: state, local or regional government, donors, project funds, and student fees (Gebreyes, n.d.). As Kerr (1963) asserts, a Vice-Chancellor must adopt a new method of being a crusader for resources. Even when staff are engaged to use the e-learning approach, teaching and marking of students' scripts will still require that staff are maintained. The current situation where university lecturers download resource materials and post them to students is lowering the quality of university education. Universities should retain staff but change the payment model so that it involves both full salary and half salary payments with benefits attached.

Recommendations

The National Council for Higher Education (NCHE) should adjust the quality assurance mechanism for online courses, distance education, accreditation and assessment measures. It may further request the African Quality Rating Mechanism (AQRM) to lower the measurement for rating the best performing universities.

Sharing of education resources, such as e-libraries/university repositories, should be encouraged. Timely decisions on the calendars for examinations, admission, and practicum/industry attachments should be taken. Learners should be given priority in the COVID-19 vaccination programme so that they are able to go for industrial attachment. The Magna Charta Universitatum (1988) states that sharing of e-copies of open resource materials for learning in universities is highly recommended in Europe. This can be workable in Uganda or East Africa, too.

Individual universities established a loan scheme to enable students from average families to access higher education through an affordable loan scheme.

Higher education institutions (both private and public) should include in the central government, the local government, and institutional budgets.

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COVID-19 and Students' Readiness for Online Learning in Higher Education Institutions in Uganda: A Case Study of Busitema University

Saphina Biira[a,b*], Lilian Gimuguni[c], Gilbert Ocen [d], Felix Bwire[d], Paul Waako[b], Leornard Wamakote[c]

[a]*Department of Physics, Busitema University, Tororo, Uganda*

[b]*Directorate of Quality Assurance, Busitema University, Tororo, Uganda*

[c]*Department of Computer Engineering, Busitema University, Tororo, Uganda*

[d]*Department of Education, Busitema University, Tororo, Uganda*

*Corresponding Author: Tel.: +256772523936, E-mail address: bsaphina@gmail.com

Abstract

Students' readiness and preparedness is essential for the effective implementation of online learning systems in higher education institutions, especially during this COVID-19 pandemic. It is, therefore, important to ascertain students' level of readiness so as to establish an effective online learning system. In this study Busitema University students' online learning readiness was investigated between the months of June 2020 and August 2020. An online self-developed questionnaire was used to obtain the data. A knowledge gap in handling online courses was evident in the results. Hence, the urgent need to continuously undertake students' online orientation through virtual training to enhance students' abilities to handle online learning and the related challenges. The academic programmes in most

universities in Uganda have a significant content of Science, Technology, Engineering and Mathematics (STEM) subjects. For the proper acquisition of practical skills in the STEM subjects, there is need to have hands-on training, hence the interest in adopting a blended approach. Unstable internet connectivity and power supply have been highlighted as one of the biggest hindrances to online learning. The other factor which came out prominently as an obstacle to online learning is the cost of internet bundles and, to some extent, ICT gadgets. For this reason, Busitema University, in its application to National Council for Higher Education (NCHE) to grant it permission to run emergency ODeL, proposed the use of the asynchronous method of content delivery, among other interventions. Most students were found to possess at least a smartphone. Although some improvements are needed, such as the provision of laptops and internet bundles, the results show that Busitema University students are at a fair level of online learning readiness, in general.

Keywords: Online learning; Higher Education Institutions; Students' Readiness; COVID-19; Uganda.

Introduction

Following the outbreak of coronavirus disease 2019 (COVID-19), which was first discovered in Wuhan City, Hubei Province, China on 31 December 2019 (Singhal, 2020), ways of doing things have changed in Uganda and the world over. COVID-19 has established itself as one of the most devastating global pandemics, and has thus influenced the socio-economic development of countries and personal status. In Uganda, the index case was confirmed on 21 March 2020 (Mbabazi, Awichi, Rwahwire, & Biira, 2020; WHO, 2020). This compelled the Government of Uganda to take immediate measures, which included placing the country on lockdown to prevent the widespread transmission of this deadly virus. The lockdown involved restricting people's movement, instituting curfew times, closing public places (such as educational institutions, places of worship etc.) and closing borders. Intense public health interventions were also instituted, and these included social distancing, contact tracing, hand-washing/sanitising and the wearing of face masks. However, this has not stopped COVID-19 from spreading. For example, by 29 October 2020, Uganda had registered 12,201 COVID-19 positive cases and 108 deaths (Worldometer, 2020). And as of 27 June 2021, the number of COVID-19 positive cases had increased to 77,505 and deaths to 868.

The Government of Uganda closed all educational institutions on 20 March 2020 as a measure to prevent the spread of coronavirus (Museveni, 2020). This implies that face-to-face teaching and learning activities in educational institutions were disrupted, and that online learning became the order of the day. With this disruption, there has been an increase in the use of online learning as a continuity plan for most higher education institutions (Busitema

University inclusive). The Ugandan government, through its Ministry of Education and Sports (MoEST) and the National Council for Higher Education (NCHE), together with the universities, is instituting a number of interventions to ensure the continuity of education amidst COVID-19. Most of the interventions can only be achieved if student-teacher and student-student interactions can be re-designed to meet the new normal. There is a need for universities to create adequate infrastructure to support online learning both in urban and rural areas so as to ensure quality and equitable access to education. Online learning, sometimes referred to as e-learning, is one of the types of distance learning in which teaching and learning is facilitated over the internet. For the students to be able to attend education, their social and economic needs must first be addressed. Therefore, the Ugandan government should scale up its support to the vulnerable students in order to overcome the effects of COVID-19 on key social and economic indicators within our societies (Akenga, 2020; Nikita, 2020). This has become even more important in the face of the second COVID-19 wave, which has again necessitated the closure of education institutions and the imposition of another lockdown on 6 June 2021 after a phased reopening of these institutions effective October 2020 (Ministry of Health [MOH], 2021).

Busitema University is located 220 km away from Uganda's capital, Kampala, with most of its academic programmes being delivered face-to-face to students before the COVID-19 outbreak. Busitema University is a multi-campus university with its six campuses being located in the rural areas of Eastern Uganda. Conversely, the university continues to face challenges regarding how to deliver online lectures to students effectively and to guarantee the quality and credibility of online assessments to ensure a smooth continuity in academic activities. The rationale for this study was to determine the readiness of students to adjust, accept and fully maximise online learning to acquire the intended knowledge and skills. The results of the study have, to some extent, assisted the university in addressing the challenges posed by online learning.

Until the most recent lockdown and the closure of education institutions in Uganda on 6 June 2017 (Museveni, 2021), students at Busitema University, just like at other universities in Uganda, had resumed their studies using both face-to-face and online methods in a staggered manner. However, measures such as social distancing, wearing of face masks, routine temperature testing and fumigation, accompanied by a high level of hygiene, had been at play so in an effort to mitigate the further spread of the virus. However, more learning activities are expected to be conducted via online platforms, such as the Moodle-based learning management system (LMS), Zoom, Skype and other online platforms to enhance social distancing. Online supervision of research students is being embraced. It is, thus, perceptible that, going forward, education and student connectivity in the new normal will largely be achieved through online learning activities with the use of high technology and digital tools that can be integrated seamlessly (Akenga, 2020; Gloria & Diana, 2020).

Thus, the aim of this study was to ascertain the students' preparedness and readiness to embrace online engagement/learning. To ensure social distancing, students may not necessarily be visible on campus but at their respective homes, where they can be engaged online effectively for both teaching and assessment. Online learning is being considered as the most appropriate way of conducting teaching and learning during the pandemic and, thus, it has become necessary to study the readiness and ability of the students to study using the new means of teaching.

2.0 Literature Review

The urgent need for and significance of online learning precedes the emergence of the very unpopular COVID-19 pandemic. As of 2013, there were already more than 40 million higher-education students in the world taking one or more of their classes online. Particular forms of digital learning focus on building educational management systems that balance individualised and cooperative forms of learning and enhance institutional sustainability. Online teaching also promotes transactional learning in which collaboration functions to reduce confirmation bias and to construct knowledge (Blayone, 2018).

2.1 Challenges of online learning

Existing research works have indicated that, in a number of cases, students undertaking higher education programmes online even in developed countries such as China fail to persist long enough to complete their respective online programmes (Guo, Zhang, He, Jin, & Shi, 2007; Aung & Khaing, 2015). This means that e-learning programmes register a relatively large number of dropouts in developing countries, although the number is lower in developed countries.

Lecturers who are transitioning from teaching in the traditional face-to-face classrooms to online courses are faced with having to keep up with technological upgrades and, in the process, with shifting pedagogical challenges. Changing or upgrading learning management systems, for instance, affects the course content, and faculty instructors are left with electronic formats of learning material that may not be very compatible with the new LMS upgrade. Therefore, in addition to having to familiarise themselves with the new upgrades, lecturers are faced with the task of revising and integrating their material into the new course management system (Lichoro, 2015). A study conducted in Ugandan universities indicated that only about 36% of the lecturers had ever designed an online course (Bwire, Bagarukayo, & Muyinda, 2020), implying that online teaching has not been widely embraced in Ugandan education institutions.

Furthermore, a report cited lack of sufficient infrastructural set-up, ranging from poor or insufficient internet connectivity and unreliable and unsustainable power supply, to inadequate availability of computer laboratory space as well as inadequate numbers of computers available to both students and lecturers to smoothly run online learning programmes as a worldwide problem (Kisanga & Ireson, 2015). Unfortunately, in connection with the above

scenario, Uganda is no exception. For example, the inadequate infrastructures, ranging from inadequate availability of computers, low server capacity, poor internet services and unstable electricity, have been reported as one of the bottlenecks to online learning (Bwire, Bagarukayo, & Muyinda, 2020). Therefore, if a student was to pursue an online course in Uganda, they would, in most cases, suffer the inconveniences caused by poor internet connectivity or, even worse, lack access to a personal computer and a reliable power supply to run it, making e-learning very difficult for them.

Preceding research work has also indicated that the attitude of both students and lecturers in Uganda to e-learning, like in most developing countries, is still lukewarm (Kamba, 2009). A survey carried out at Busitema University in June 2020 revealed that a greater percentage of the students, regardless of the existence of COVID-19, would prefer to continue with the traditional face-to-face learning rather than undertake their respective programmes in an online learning format. This means that there is a relatively low degree of acceptance of online learning at the university and this is bound to affect the university's preparation and readiness for online learning (Aung & Khaing, 2015). However, with the persistence of the COVID-19 pandemic and the continuous closure of education institutions, the mindset of students is slowly changing, though they are still sceptical owing to the challenges already experienced with the online learning classes attended.

2.2 Strategies to enhance online learning

Various strategies to enhance online learning have been reported. These include the following: Dividing the teaching content into smaller, easily digestible units to help students concentrate better. By reasonably breaking down the content intended for in-class teaching into different topics and sub-topics, a clear knowledge structure is established in the curriculum. In other words, faculty instructors should divide the teaching content into numerous small modules, with each lasting between 15 and 25 minutes (Bao, 2020).

The use of renewable energy, especially solar energy, in places without access to nationwide electricity lines would adequately tackle the shortage in power supply (Kisanga & Ireson, 2015). This would allow students in these remote locations to power their computers and engage in distance learning with fewer hindrances. Renewable energy use will undoubtedly not only increase the number of students enrolling for e-learning higher education programmes in Uganda but also raise higher education enrolment countrywide.

To improve the attitude of students towards online learning in Africa, universities should provide tutorial support for their learning management systems (Kamba, 2009) with the aim of making browsing or navigating through the university an easy task for scholars. Universities in Uganda should also emphasise the strategic use of audio recordings to capture the attention of students and emphasise content keywords to students. This can be done by, for instance, slowing one's pace or raising one's voice in an audio recording since e-learning

cannot leverage what traditionally would have been done through the use of body language, facial expressions and the teacher's voice (Bao, 2020).

Methodology

An online structured questionnaire was designed in Google forms with a web-based application. A link was extracted and widely distributed to Busitema University students' email and WhatsApp accounts in the month of July 2020. The survey was carried out for a period of two months to give time to students to respond. Though all students of the university were required to fill in the online questionnaire, only 900 out of 3,893 students responded. These students were drawn from all the university campuses/faculties. The faculties included the Faculty of Engineering, the Faculty of Science and Education, the Faculty of Agriculture and Animal Sciences, the Faculty of Management Sciences, the Faculty of Health Sciences, and the Faculty of Natural Resources and Environmental Sciences. The study was conducted to enable the university to assess the extent to which the students were ready for online learning amidst the COVID-19 closure of education institutions. The online questionnaire designed in Google forms automatically collected the data and did a certain amount of analysis. The findings are presented in the next section.

Results and Discussion

Background information on the students

The student respondents, 98.8% were Ugandan and 1.2% were East African. The Ugandan students were scattered throughout the country, as revealed by their districts of origin and their location at the time of the survey. The results show that most of the respondents were male students (68%) compared to females, who represented 32% of the respondents. This is reflected in the gender gap among the students at the university, where there are more males than females. There is also a possibility that more males were able to access the online information from the university compared to their female counterparts. For example, Imhof, Vollmeyer and Beierlein (2007) report that computer user behaviour appears to be gender-specific as males spend more time on the computers for personal purposes than females.

In the results of the survey, every academic programme and the students' respective years of study were represented. The academic programmes included certificate, diploma, bachelor's and master's degree progammes. Very few certificate and diploma students attempted the survey. This indicated that there is a relationship between level of education and computer use and access to online information. Therefore, there is need to reach out to this category of students in terms of provision of training and also to inform them about the university activities.

The results show that the majority of the students (70%) were between 18 and 24 years, and 26.9% were between the ages of 25 and 35. Only 2.8% were above the age of 35 and none of the respondents was below the age of 18 years. Most students after high school are above

the age of 18 as they join university directly; direct university entrants form the majority of the university students. Students between 25 years and 35 years also constitute a fair fraction of all students (at 27%), and these include postgraduate students. No respondent was below the age of 18 and yet the university has students who are in this category (students pursuing certificate courses). This category of students might not have got access to the questions since what was used was an online questionnaire.

ICT skills of students and access to internet

Students' ICT skills are prerequisite skills that can enable the students to comfortably take up online learning. In this study the students were asked to state their ability to use the computer and internet. The results in Table 1 indicate that the majority of students (about 93%) have basic knowledge of using a computer and are able to access and utilise digital materials properly. If online learning is adopted, the few students (about 7%) who lack this basic knowledge can be trained and will also be able to use electronic study materials. The results also show that over 70% of students can use the internet (38.1% strongly agree, 36.6% agree). The 17% who responded were neutral regarding this question have basic knowledge of using the internet, but may not be savvy enough to navigate online resources Therefore, the results show that the majority of the students are able to access the resources available on online platforms, apart from 8% of them, who can be trained.

Table 1: Ability to use computer and internet and also stability of internet connectivity at current students' location and at the university

	SA	A	N	D	SD
I can comfortably use a computer	40.5%	42.6%	10%	5%	2%
I am comfortable using the internet	38.1%	36.6%	17%	5%	3%
Internet connectivity in my current district of residence is stable	14%	31%	27%	17%	11%
University internet service is stable	16%	34%	25%	17%	8%
Power at the university is stable	51.1%	13.3%	20.6%	15%	0%
Power at home is stable	30.2%	17%	19.8%	23%	20%

Most of the districts where the students resided by the time of the survey had internet access (see Table 1). This means that if online learning is adopted, students will have access to learning. The university internet connectivity services were also examined. Fifty per cent of the students agreed that it was stable, 25% were neutral (neither agreed nor disagreed) and the rest disagreed (see Table 2. This means that university internet connectivity at all campuses needs to be improved and bandwidth upgraded. Power was reported to be stable at the university as compared to students' homes, as indicated in Table 1. However, there is need to improve it

since power stability affects internet stability. The ICT equipment also requires stable power for it to function. Otherwise the whole online learning process will be interrupted.

3.3 Students' access to ICT tools

The students were asked to select whether they owned the following ICT tools: i.e. a desktop PC, laptop, tablet, smartphone or none. The results revealed that 30.7% of the respondents owned laptops and 12% a desktop computer. When asked whether they owned a tablet/ipad, only 6.3% of the respondents stated that they owned tablets/ipad, as shown in Figure 1(a). However, the majority of the students (84.6%) owned smartphones and 4.9% did not own any of the stated ICT tools. This means that if online learning is adopted, then 4.9% of the students might not have access, but the vast majority (about 95%) will access to the electronic resources.

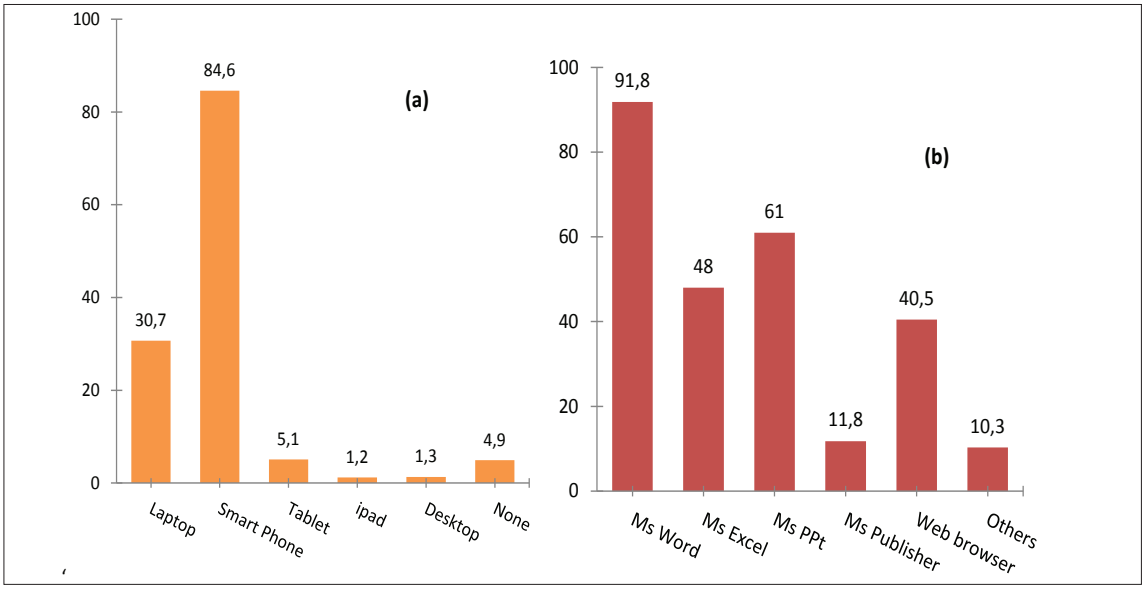

Figure 1(a): Percentage of students who owned different ICT tools; and (b) Percentage students with knowledge of different basic computer applications

The students were asked to state the common computer applications they use often for their work. Most students mentioned the basic applications Microsoft Office and web browser, and some mentioned subject-specific applications. The results are shown in Figure 1(b). This means the students have basic knowledge of computer applications which are commonly used in lecture delivery and can build on that to attain advanced knowledge.

The students were also asked to state how readily they could acess the internet in terms of data bundles and the mobile telecommunication network they subscribe to, the amount of money spent on data bundles on a daily basis, and internet connectivity and stability at their respective locations.

The resluts of this survey showed that many of the students subscribed to MTN-Uganda and Airtel-Uganda, at 69.5% and 68.9 respectively. The other networks were Africel, UTL,

Safaricom, Smart-U and K2, at 3.6%, 0.3%, 2.1%, 0.3% and 0.3%, respectively. This means that if the university is to pay for zero rating of the learning management system, then it should choose between MTN-Uganda and Airtel-Uganda or both. This is because many students already have these network lines. The other students who did not subscribe to these mobile networks can be encouraged to acquire the selected mobile telecommunication line at a subsidised cost.

When the students were asked whether they purchased data bundles; the results revealed that 55% of the respondents purchased their data bundles, 23% were not sure and only 22% did not purchase data bundles at all. This may be because they could not afford it, or did not have a gadget that can support the use of the internet. The majority of the students (about 70%) could afford to spend not more than Uganda shillings (UGX) 1,000 a day. The data bundles equivalent to UGX 1,000 may not support online learning, especially if synchronous learning is adopted. Therefore, the lecturers may have to adopt asynchronous learning to save data both for the students and the teacher. It was recommended that the university consider supporting students and staff to purchase data and that the learning management system be zero rated. This will allow students to have access to learning materials, as well as to interact with the teachers and fellow students. In this case, the students would concentrate on their studies without worrying about the costs involved, just like before when teaching/learning at the university fully involved face-to-face interaction.

3.4 Online learning readiness

To establish the students' readiness for online learning, a number of questions were asked to the students. These included whether the students had ever attended an online course, the number of hours they can spend online in a week and their knowledge about the learning management system (LMS).

The results of this study clearly revealed that the majority of students (up to 77%) had never attended an online course. This requires that the students first be trained/oriented in online learning before it can be adopted as a teaching and learning strategy. The findings showed that the majority of the students (78%) can spend a maximum of 20 hours on online learning activites. This is lower than the time that might be required, given that all the courses they study in a semester will be conducted online for them to access. This means that the lectures have to be restructured and organised so that the students are able do self-reading offline. It was also revealed that only 58% of the students were aware of a the availability of a learning management system at the university (see Figure 2(a)). This points to the need to create more awareness about the learning management system and online learning at the university.

A considerable percentage of the students indicated that they had ever used at least one of the features of the learning management system, with only 7.5% dating that they had used none. However, it was discovered that very few students had knowledge of free online resources and could mention any free online source of these learning materials.

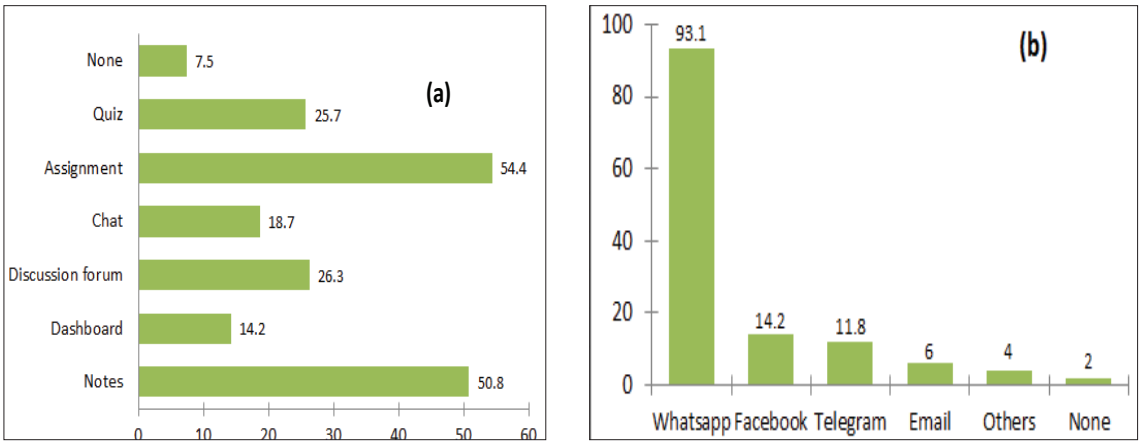

Figure 2: Percentage of students who (a) have used various LMS features and (b) are using different online media platforms

The students were asked if they had ever accessed learning resources through social media platforms. The majority stated that they had ever accessed learning resources through social media platforms, as shown in Figure 2(b). The social media platform mostly used by students to access learning materials is WhatsApp, followed by Facebook, Telegram and then email. Even though social media platforms were not designed with pedagogy principles in mind, most students have been exposed to online learning to a small extent. This can be a stepping stone to building students' capacity for online learning.

Apart from 20.1% of the respondents, a considerable percentage were found to be familiar with at least one of the video conferencing tools. The video conferencing tools that were listed included Zoom (65%) and Google Meet (20%). The rest (Microsoft Teams, TeamViewer, ClickMeeting and Skype) each had less than 10% use. However, about 20% of the students indicated that they had never used any of the listed video conference tools.

3.5 Willingness to study online

The students were asked about their willingness to attend an online course. The majority (85.7%) indicated their willingness to study online. Only 14.3% of the students stated that they were not willing to study online. The percentage of willingness obtained in a study is close to that obtained by Neupane, Sharma and Joshi (2020). Those who were not willing expressed fears related to internet and power connectivity, data bundle costs, compromising the quality of learning, especially when it comes to practical learning, tuition fees, and the availability of time while at home, among others. There is need for sensitisation of students to what the university can offer and what is expected of the student, as well as psychological guidance on issues related to online learning. For example, over 56.3% of the respondents were aware of the university initiatives towards online learning but stated that they were not aware of the initiatives the university had come up with about online learning.

When the students were asked what they thought the university should do to ensure smooth teaching and learning after reopening, they advised that the learning should start from where it stopped, meaning that the students have not been engaged during the lockdown. Adherence to COVID-19 standard operating procedures (SOPs), such as social distancing as well as the provision of PPE and sanitisers, was one of the popular issues the students mentioned. The need for the university to improve on power stability, internet bandwidth and connectivity was also highlighted by the students. The students encouraged the university to adopt online learning and, where this is not possible, consider face-to-face learning, ensure that counselling and guidance is conducted regularly, train students and staff, and consider subsidising the cost of data for all. They also implored the university to employ enough serious lecturers and ensure that the lecturers are available to the students, as well as improving the technology to facilitate learning. The students emphasised the need for the university to draw up fresh workable teaching/learning and assessment schedules, conduct remedial teaching and create enough time for the students to catch up. Other students suggested that the university should declare the period of closure a dead year and repeat all the courses already done during the semester. The privately sponsored students requested that they be handled with patience or even be offered reduced tuition fees options. Whereas other students suggested that the university should wait for the COVID-19 situation to normalise and then follow the normal routine of teaching and learning.

4. Conclusions

The study shows that the majority of students have computers and smartphones and can, therefore, access online platforms for learning purposes. Those who do not have them should be helped to acquire them at subsidised cost. The students can use the computers effectively and search the internet. The study further shows that the majority of the students have never done an online course and have no knowledge of online learning at the university. It is, therefore, important that before online learning starts, students should be well trained in online learning concepts and how to study using the online mode. This will be very important since the majority of the students expressed willingness to continue their studies online. Network providers, especially MTN and Airtel, to which many students subscribed, should improve their network as well as reduce their tariff to enable students to purchase data at an affordable price. In the meantime, the universities in Uganda should continue subsidising data costs for the students so as to enable them to more easily access learning materials online (zero rating LMS). This will encourage faster and easier download of learning materials. Power supply, which is irregular in several parts of the country, should be improved to encourage internet accessibility for educational purposes. This will reduce the incidence of running out of power/batteries on the students mobile and laptop devices, which often interrupts their use of the internet. When this is resolved, it will improve teaching/learning and research.

5. Limitations

Although the findings of this study provide useful information about the profile of students, factors affecting their online learning readiness and preparedness, a more comprehensive study should be conducted throughout Uganda, both online and offline, so as to reach as many students and teachers as possible. This would make it possible to ascertain a model that is suitable for the whole country to transition to online learning.

Also, the students' response rate was low. Only 900 students out of the total of 2,893 responded to the survey, accounting for a response rate of 23%. Even though this was above the normal response rate for online surveys as reported by Manfreda, Bosnjak, Berzelak, Haas and Vehovar (2008) and Fan and Yan (2010), the sample does not represent the whole target population expected to be taught online. Therefore, generalisation of the results of this study should be done with caution.

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Implications of COVID-19 Pandemic for Uganda's Higher Education Policy Regime: A Meta-Analytic Systematic Review of Literature Using the Prisma Model

[1]James C. Okware – Kyambogo University
jc.okware@kyu.ac.ug

&

[2]Josephine Esaete, PhD – Makerere University
esaete@mak.cees.ac.ug

[1]Doctoral Fellow – Department of Science, Technical & Vocational Education (DSTVE), College of Education and External Studies (CEES), Makerere University

[2]Senior Lecturer – Department of Science, Technical and Vocational Education (DSTVE), College of Education and External Studies (CEES), Makerere University

Abstract

The outbreak of the COVID-19 pandemic is the most tangible manifestation of the fusion of the physical, digital, biological and social worlds of the current 4th Industrial Revolution era. The COVID-19 pandemic is the single most serious disrupter to the global education and training industry. Uganda's higher education policy stakeholders did not anticipate the pandemic and, therefore, had no prior mitigation plans. Because of the global and overarching nature of the disruptions of COVIC-19, there has arisen an

information overload of frameworks meant to guide higher education policy and practice. These policy frameworks originate not only from different regions and contexts, but also from different nations – nations at different socio-economic development levels and with varying resource envelope sizes. This leaves Uganda's higher education with no clear policy guide for use in mitigating the disruptions of COVID-19.

The aim of this study was to systematically review the available knowledge on the impacts of the COVID-19 pandemic on Uganda's higher education and to propose a context-specific guide by which Uganda's policy regime may appropriately respond to the pandemic's disruptions in the light of Uganda being a developing nation amidst the current 4th Industrial Revolution. To achieve this aim, the review sought answers to four specific higher education policy-leaning questions: What is the 'new normal' for higher education learning in Uganda amidst the disruptions of COVID-19? What are the major impacts of COVID-19 on Uganda's higher education policy framework in the context of her level of socio-economic development? What does the timing of the COVID-19 pandemic mean for Uganda's higher education policy in light of the 4th Industrial Revolution era and her level of socio-economic development? What specific mitigation strategies can Uganda's higher education policy regime adopt in responding to the disruptions of COVID-19?

Undergirded by the PRISMA model, the authors used the systematic literature review method, with a 7-step protocol search strategy, to search sources; screen for eligibility, define the inclusion/exclusion criteria, synthesise findings, draw conclusions and proffer recommendations.

COVID-19 has devastated Uganda's higher education practice relative to that of developed nations. Policy responses to the COVID-19 pandemic cut across Science, Technology, Engineering and Mathematics (STEM) and Arts subjects alike. ICT innovations are leading the way in Uganda's higher education policy responses to the disruptions of COVID-19. Uganda's higher education policy regime urgently needs an action plan to improve the digital literacy skills of its learner and teacher stakeholders.

Keywords: COVID-19, higher education policy, systematic review, 4th Industrial Revolution, Uganda.

1.0 Introduction

The coronavirus responsible for the deadly COVID-19 disease originated from Wuhan, China in December 2019 (Adams, 2021;

International Association of Universities [IAU], 2020; Spinney, 2020; WHO, 2019). COVID-19 disease is caused by a biotic pathogen codenamed SARS-Cov2 (Josephson, Kilic & Michler, 2021; WHO, 2019).

Because of the pandemic's extensive disruptions to the world's major socio-economic systems – health, economy and education – the World Health Organisation (WHO) declared COVID-19 disease a pandemic on 11 March 2020, according to the International Association of Universities (IAU) (IAU, 2020).

In the view of Pokhrel and Chhetri (2021), the COVID-19 pandemic is the single most serious disrupter to the education and training industry in the history of the world, having impacted more than 1.6 billion learners in more than 200 countries, as per December 2020 estimates. Tumwesige (2020) specifies that the COVID-19 pandemic has impacted over 91% of the learners in the world.

In the Ugandan context, before the current second wave of COVID-19 infections and deaths, the pandemic had directly disrupted the learning of approximately 170,000 higher education students (Kabahizi, 2020). In the view of Nabukeera (2020), Uganda's higher education sub-sector was suddenly jolted by an abrupt, unplanned, unwanted and hitherto unexperienced test in online learning due to the novel COVID-19 pandemic. For that matter, Uganda announced the closure of all schools, including a total of 3,013 institutions of higher learning (both public and private), on 20 March 2020, forcing a total of 311,556 students out of school (Alonge, n.d.). The COVID-19 pandemic also directly impacted nearly 100% of the other higher education stakeholders, including teachers, funders, policymakers, parents and guardians (Senyonyi, 2020; Agaba, 2020).

1.1 Purpose of the Study

The aim of this study was to conduct a systematic literature review (SLR) on the disruptions the COVID-19 pandemic is exacting on Uganda's higher education sub-sector in order to develop a context-specific guide by which Uganda's higher education policy regime may respond to the disruptions in higher education learning by COVID-19. The authors considered the two issues of Uganda's level of socio-economic development and the 4th Industrial Revolution (4IR) economic phenomenon as the cross-cutting issues in the systematic literature review.

In order to achieve the above study aim, the authors sought answers to four specific questions from literature: What is the 'new normal' of learning for Uganda's higher education in the context of the disruptions of the COVID-19 pandemic? What does the timing of COVID-19 pandemic mean for Uganda's higher education policy regime in the light of the 4th Industrial Revolution phenomenon? What are the major impacts of COVID-19 on Uganda's higher education in the context of its level of socio-economic development? What mitigation strategies can Uganda's higher education policy regime adopt as a response to the disruptions of COVID-19 pandemic?

2.0 The Study Conceptual Framework

2.1 The 21st century and the 3rd millennium

The 21st century (21C): The 21st century refers to the current 100-year timeframe of human civilisation which began early in the year 2001. Given the fact that a century is 100 years, the 21st century is projected to continue through to 31 December 2100 (Smith, 1988). The 21st century belongs to the prevailing 3rd millennium, which began in AD 2001 and will continue through the year AD 3001. The past 1st millennium comprised the years AD 1 to AD 1000 and the immediate past 2nd millennium was from the years AD 1001 to AD 2001.

The 21st century skills concept is an important cross-cutting issue in this study because humankind is currently living and educating its learners to be healthy, knowledgeable and sufficiently skilled to work in the new21st century, its erratic 4IR economy or job market, as well as in the midst of complex and divergent problems (DP) such as the COVID-19 disease, climate change and sustainability, high unemployment and general economic recession.

According to Valdesuso (2011) and Schumacher (1977), divergent problems (DP) are paradoxical, logic-defying socio-economic conditions; these demand mutually opposing solutions and must, therefore, be solved using the highest levels of the epistemological pyramid – namely understanding and wisdom. The epistemological pyramid comprises five aspects in total – data, information, knowledge, understanding and wisdom (Daniel -31:3, 2018; Valdesuso, 2011).

The COVID-19 pandemic is one of the divergent problems of the prevailing 21st century's chronological era and complex 4IR life. The spread of the COVID-19 pandemic is synonymous with the rapid diffusion of 21st century's phenomena of globalisation, knowledge, cultures, services and products.

2.2 Concept of the 4th Industrial Revolution

In the view of McGinnis (2020 p.1), "the 4th Industrial Revolution (4IR) is a way of describing the current blurring of boundaries between the physical, digital, and biological worlds". It is a 21C socio-economic structure in which the physical, digital and the biological worlds are fused during the making of new products and services and deliver them to where they are needed as a response to the erratic changes of the current 21C (McGinnis, 2020; Fomunyam, 2019). The 4IR socio-economic set-up is a 21C phenomenon mainly driven by the rapid developments, inventions and innovations in the information and communication technologies (ICT) sub-sector (Nasir, 2017; Kelly, 2016; Fadel, Bialik, & Trilling, 2015; Afua, 2009).

3.0 Method

3.1 Systematic literature review

The authors used the systematic literature review (SLR) method, undergirded by the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) model. The PRISMA

model is a checklist of 27 items to guide the systematic and meta-analytic review and synthesis of existing knowledge on a subject of interest (Lyaka, 2018; Siddaway, 2014). According to Van Laar, Van Deursen, Van Dijk and De Haan (2017, p. 3), a "PRISMA checklist is not intended to be a quality assessment tool, but to ensure clarity and transparency when reporting systematic literature reviews". SLR is the analysis and synthesis of "a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research and to collect and analyse data from the studies that are included in the review" (Moher, Liberati, Tetzlaff, & Altman, 2009, p. 264). So, for purposes of clarity and transparency, the PRISMA model's checklist of 27 items and the 4-step flow chart were used to report the study results (Van Laar *et al.*, 2017).

The SLR method was used because it is a policy-leaning research design and this study is policy-leaning. According to Siddaway (2014), literature reviews are the better research design for policy studies. Moreover, in the view of the authors, and as can be seen from the name, SLR is an orderly and structured literature collection, analysis and synthesis process. This lends SLR to the positivist paradigmic claim to knowledge generation (Creswell, 2014) and, thereby, qualifies it as one of the most objective qualitative research approaches available. This study also used the SLR method because it is helpful in the accurate and reliable synthesis of the available academic literature (Van Laar *et al.*, 2017).

3.2 Database and search terms

The authors used the Google Scholar database to retrieve the requisite COVID-19 data (publications) in the form of journal articles. This is because Google Scholar is an academic database with an inherently reduced bias as it provides information sources (data) on all subjects, including gray literature, and is not subject-specific (JEPS, 2018; Siddaway, 2014). This study could not search other systematic literature review databases such as BIOMED and PubMed because these are purely medical science data sources, rather than those that focus on the policy aspects of the impacts of COVID-19 that are more socio-psychological in dimension. The authors limited the study publications to a timeframe of between 2019 and 2021. The baseline year for the study was 2019; this is because 2019 is the year the COVID-19 pandemic erupted in Wuhan, China (IAU, 2020; WHO, 2019).

The study search terms were "COVID-19", "Impacts", "Uganda", "Policy", "Disruptions" and "Higher Education". The study Boolean Logic operators were "AND", "OR" and "NOT". The study used the asterisk mark (*) wild operator, and no truncation word varieties.

3.3 The study strategy and protocol registration

The study did bot its search protocol. This was due to the limited timeframe provided by the manuscript solicitors. Under normal circumstances, systematic literature reviews take between six and18 months or six months to one and a half years (Libguides, 2021). The time provided for by the manuscript solicitor was barely two months.

The review was guided by a 7-step protocol: (i) Determining appropriate search terms or phrases; (ii) Developing the review protocol (scoping); (iii) Screening; (iv) Determining the eligibility criteria; (v) Inclusion and exclusion criteria; (vi) Discussion of evidence; and (vii) Conclusion, if any. See Table 3.1 below.

3.4 Identification and protocol development

This involved determining and creating relevant search terms and phrases. The study's key search terms and phrases were 'impacts' or 'effects', 'COVID-19 pandemic' or 'COVID-19 disease', 'higher education policy' and 'Uganda'.

3.4.1 Identification of records (information sources)

(i) The relevant information sources (records) were identified using the Google Scholar database on the impacts of COVID-19 on Uganda's higher education policies were denoted by the symbol *n, where n is the number of identified full-text articles*. Similarly, the additional sources identified using other sources aside from Google Scholar were denoted by the symbol *n*=.

Screening:

(i) Duplicate sources from both Google Scholar and other relevant sources were sifted and excluded or discarded. The remaining relevant sources, upon excluding duplicates, were also denoted by letter *n.*

Eligibility:

(i) All the full-text articles in the final *n* were assessed to determine whether they were eligible or suitable or whether they qualified for inclusion in the study and, again, these too were denoted by the letter *n*. Conversely, using the pre-defined exclusion criteria, all the full-text articles deemed ineligible were excluded from the review. Again, the excluded full-text articles on the impacts of COVID-19 on Uganda's higher education policymaking were denoted by the symbol *n*=.

Inclusion:

(i) The studies included in the review of the impacts of the COVID-19 pandemic on Uganda's higher education policies were categorised into two – studies for qualitative synthesis, denoted by the symbol *n*=, and studies for quantitative synthesis or meta-analysis, also denoted by the symbol *n*=.

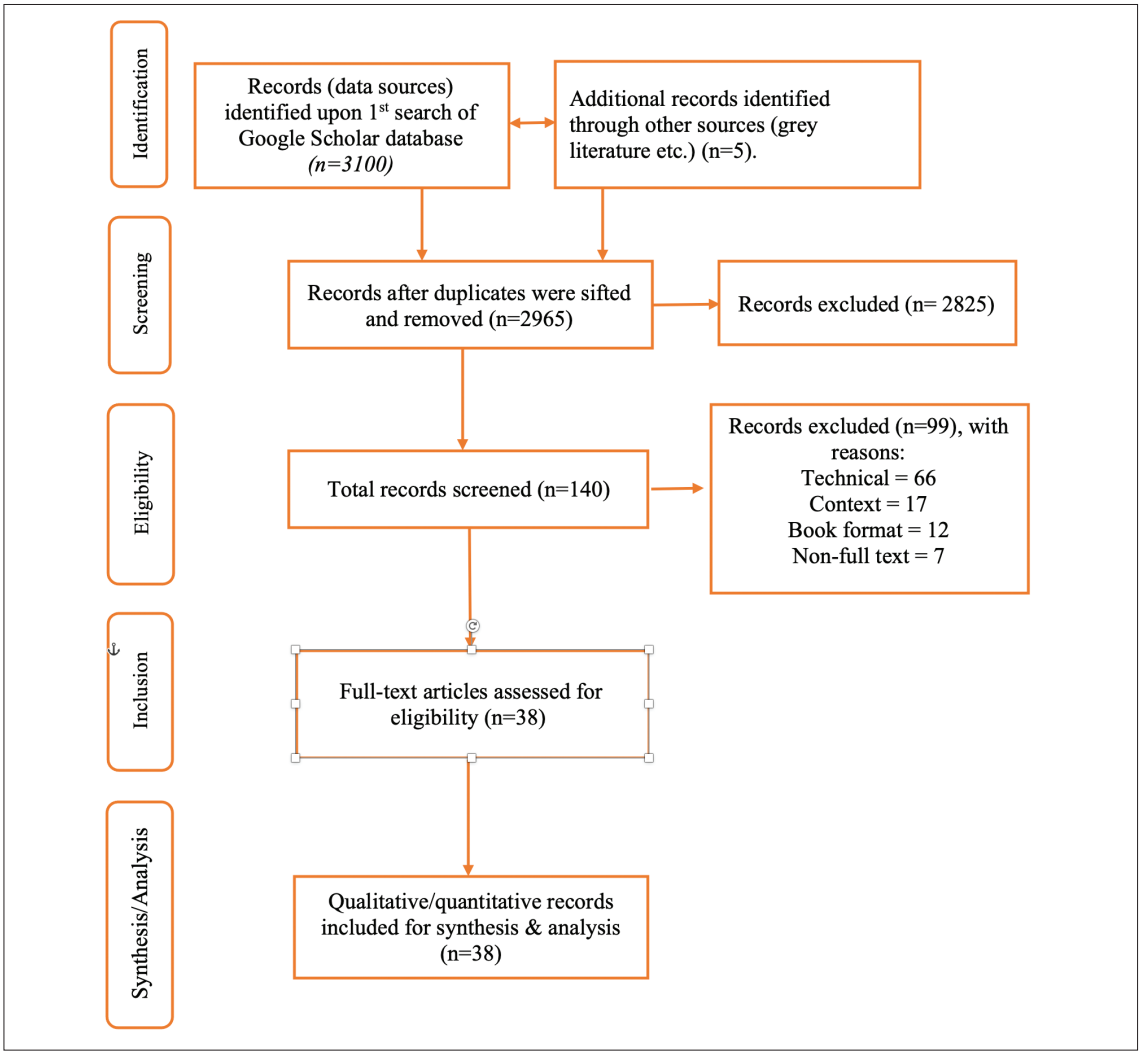
Results, synthesis, discussion, summary of evidence and limitations:

(i) The study provided numbers of the studies screened, assessed for eligibility, and included or excluded in the review, with the reasons for exclusion at each stage provided (see the flow diagram – Figure 3.1 – below).

The conclusion and funding disclosure:

This describes the conclusion to the findings and the disclosure of the sources of funds for the study in order to ensure transparency.

Figure 3.1: The study PRISMA checklist flow chart



Source: Adapted from Lyaka (2018), Siddaway (2014) and Moher et al. (2009).

This study was motivated by the desire to proffer answers to four pertinent research questions.

4.0 The Objective-Wise Synthesis of Literature

4.1 COVID-19 and the 'new normal' in Uganda's education

This study's first objective was to find out the 'new normal' in Uganda's higher education as a result of the COVID-19 pandemic. Therefore, the research question this objective sought to answer was: *What is the 'new normal' in Uganda's higher education scene as a result of the COVID-19 pandemic*? According to Pokhrel and Chhetri (2021), IAU (2020) and UNESCO (2020), the onset of COVID-19 disease disrupted the learning of approximately 1.6 billion learners in 185

countries of the world, and at all levels of the education system, constituting at least 89.4% of the world's learners.

In the view of the authors, whether Uganda's higher education policy regime is prepared or not, the disruptive impacts of COVID-19 have set the stage for a 'new normal' in the nation's higher education sub-sector, including policymaking, funding and practice. COVID-19 has disrupted all sectors and operational conventions of Ugandan society. As Kajeet (2021) and Chankseliani and McCowan (2020) found out, the perceived new normal on account of the COVID-19 pandemic is a worldwide phenomenon, and has affected all aspects of life.

The disruptive new normal due to COVID-19 disease is especially critical for Uganda's higher education policy regime because higher education is the sub-sector that is directly responsible for developing the human capital and human resources (HR) needed to run the nation's job market, particularly the job market of the erratic 4IR of the current 21C (Muyingo, 2021; Driscoll, 2020; Fanelli, Cajuste, Cetta, & Amanya, 2020; Kasozi, 2018).

The specific new normal circumstances the COVID-19 pandemic has subjected Uganda's higher education policy and practice regimes to include:

4.1.1 School closures

This involves the closure of universities, other higher education institutions and schools (IAU, 2020; Aristovnik, Kerži˘c, Ravšelj, Tomaževi˘c, & Umek, 2020; UNESC, 2020). In Uganda, following a presidential directive (Nabukeera, 2020), universities and other tertiary institutions (UoTI) closed shop in early February 2020 and learners were ordered to go home. The new normal of closed schools and remote distance and home learning environments demands the deployment of new learning technologies (Tumwesige, 2020; Nabukeera, 2020). Following another presidential directive, schools, universities and other tertiary institutions (UoTIs) were closed in June 2021, following a resurgent second wave of the COVID-19 pandemic. Unnamed sources are even predicting the third wave of the pandemic later this year.

4.1.2 Transmission of teaching and learning

Another new normal Uganda's higher education policy regime has to contend with as a result of the COVID-19 pandemic is transition in teaching and learning from the conventional on-site face-to-face learning to online remote learning (Salmi, 2020; Owusu, Koomson & Hanson, 2020). Marioni, van't Land and Jensen (2020) describe this new normal simply as the transition to distance or remote learning. Uganda's higher education policy must take into account the inevitable transition in teaching and instruction mode and platforms. In particular, higher education governance and policy ought to cater for the change in teaching spaces, new teaching modes as well as the internet data which drives remote teaching and learning (ACU, 2020).

According to the International Monetary Fund (IMF) (2018), the World Bank Group (WBG) (2019) and the Global Innovation Fund (GIF) (2021), however, Uganda is classified as a low-income country (LIC) with poor infrastructure and, therefore, limited internet penetration. In the view of the authors, internet penetration and related bandwidth is one of the critical

pieces of infrastructure for successful remote, distance learning practices. According to the WBG (2020), by 2018 – i.e. just a year before the dreaded COVID-19 pandemic struck – the proportion of the population with internet connectivity in LICs was 15.8%. If Uganda's higher education policy regime takes no urgent reactive steps, the little, poor or no internet access will most definitely help the pandemic grind to a halt Uganda's higher education learning.

Soon after the second wave of COVID-19 hit Uganda, for example, students in one of Uganda's premier universities went on strike protesting inadequate, or non-existent, learning due to limited internet.

4.1.3 Increased deployment and use of educational technologies

Another new normal in Uganda's higher education scene as a result of the COVID-19 pandemic is the increased deployment and use of information and communication technologies (ICTs) in education and learning delivery (Kajeet, 2021; Tumwesige, 2020).

4.1.4 Enrolment numbers

The COVID-19 pandemic has decreased the enrolment of students in universities and other tertiary institutions in Uganda. In a survey, Marioni, van't Land and Jensen (2020) established that about 84% of the higher education institutions in the world believed that the COVID-19 pandemic would negatively impact on their enrolment numbers. O'Brien (2020) reports that colleges in Ireland feared losing millions as foreign students may be obliged to cancel enrolment. According to Salmi (2020), it is estimated that the COVID-19 crisis could annihilate the progress in higher education enrolment experienced in the past decades. Marklein (2020b) reports that loss of international enrolment due the pandemic would cost universities alone a $4.5 shortfall in revenue.

In the view of the authors, Uganda's 2020/2021 academic year calendar was totally unclear, with enrolment numbers remaining undisclosed.

4.1.5 Operational uncertainty and emotional instability

The COVID-19 pandemic has also impacted higher education students' practices regarding academic work and life (e.g. the switch to online lectures/tutorials, closed libraries, changed communication channels for teachers' and administrative support, new assessment methods, different workloads). Salmi describes this scene thus:

> The abrupt closure of campuses and the rapid switch to online education have disrupted students' lives all over the world. It's no surprise that students from underrepresented groups (low-income students, girls and women, members of minority groups, and students with special needs) have been hit especially hard – economically, emotionally, and in terms of digital deprivation. In poorer countries, students from disadvantaged groups face even greater difficulties. (Salmi, 2020 p.5).

In the view of the authors, due to uncertainty imposed by COVID-19, Uganda's higher education policy regime was unable to come up with a useable academic calendar. According

to the *Informer* (2021, June 9), education governance came up with a new and different academic calendar and opening dates almost on a weekly basis.

The authors believe that the challenges constituting the new normal of Uganda's higher education are a direct result of the fluid nature of the COVID-19 virus, as it appears to mutate over small time periods.

4.2 Major impacts of the COVID–19 pandemic on Uganda's higher education policy

This study's second objective was about the impacts of COVID-19 on Uganda's higher education policy and, therefore, the study question it sought to answer was: *What are the major impacts of COVID-19 on Uganda's higher education policy in the context of the nation's level of socio-economic development?*

4.2.1 Introduction

According to the WBG (WBG, 2020; UNESCO-UNEVOC, 2019), different nations are at different levels of socio-economic development. Marope, Chakroun and Holmes (2015) describe this in terms of nations of the world being at 'different waves of development'.

The authors' view is that Uganda's level of socio-economic development then becomes a key cross-cutting issue as an effective response of Uganda's higher education to the disruptions caused by COVID-19 then depend on the size of the nation's economy and resource envelope. The differences in levels of socio-economic development of the nations have led to dichotomous categorisations in which nations al the lower end, such as Uganda, are labelled as least developed countries (LDCs) or low-income countries (LICs) (GIF, 2021; WBG, 2019; IMF, 2019). On the other hand, nations with bigger economies and service industries, mostly comprising nations and territories in Northern America, Western Europe and South-East Asia, are categorised as developed nations.

4.2.2 Sickness and fatalities

The very first impact of the COVID-19 pandemic Uganda's higher education stakeholders had to contend with was the falling sick of learners, teachers, and the policymakers themselves. COVID-19 has caused the death of higher education stakeholders. The authors believe that there is not a single higher education stakeholder that has either not fallen ill, or lost a colleague, a relative or friend to COVID-19.

4.2.3 School closures

The second high-profile impact of COVID-19 on Uganda's higher education sub-sector derives directly from the first; and that was a reaction by governance and policy to close schools, colleges and universities (Nabukeera, 2020). According to Salmi (2020), even when institutional closures were inhumane and harsh to many stakeholders, campus closures certainly helped prevent the spread of the virus within higher education institutions. He adds that, for example, the school closures of March 2020 resulted in unequal learning opportunities for many students left without devices or proper internet connection – even in Organisation for Economic Co-

operation and Development (OECD) countries. Like Uganda, the situation was no different in most of sub-Saharan Africa (SSA). Kokutse (2020) writes that the president of the Council of Independent Universities in Ghana announced that many institutions could be forced to close if the effects of the pandemic went beyond June 2020; whereas in Rwanda, a few private universities had begun to fire staff by June 2020.

4.2.4 Transition to remote online teaching and learning

When it became clear to the Ugandan authorities that COVID-19 was spreading rapidly on both global and local scales, the President directed that schools, universities and other institutions of learning be shut down as a means of controlling the spread of the pandemic (Nabukeera, 2020; Tumwesige, 2020; Kabahizi, 2020). The authors, however, think that closing the learning institutions was the easy part. This is because presidential directives simply override all policies, and only take account of the prevailing issue of concern. As elsewhere in the world, higher education institutions went from the conventional face-to-face teaching to off-site remote teaching and learning after only a few days' preparation. According to Agarwal, in Salmi (2020), the world of higher education literally went from 1 or 2 or 3 % learning online to 100 % learning online.

4.2.4 Student enrolment and related income

Yet another impact of COVID-19 on Uganda's higher education policy has to contend with is the dwindling enrolment numbers. In the view of the authors, this was caused by multiple COVID-19 facets. The pandemic destroyed the sources of income of the parents and guardians of many of the learners, rendering them unable to pay up (Nabukeera, 2020; Salmi, 2020). As the learning institutions were closed, the businesses owned by parents and guardians followed suit, implying loss of jobs and businesses.

Closely related to the impact of COVID-19 on student enrolment in higher education institutions in Uganda is the loss of income by schools and institutions, especially private institutions. That is because nearly 100% funding of private institutions accrues from student tuition and fees.

4.2.5 Quality of teaching and research

The severity of the impact of COVID-19 on Uganda's higher education has snowball effects. Salmi (2020) put it this way:

> In many developing nations, where public funding for higher education has often been insufficient—usually less than 0.5 % of GDP—the consequences could be dire. Reduced public budgets, combined with the diminished likelihood of increased private funding, could mean that many students opt out of higher education, undermining institutions' ability to sustain the quality of teaching and research. (Salmi (2020, p. 7)

From the above views, it is clear that the impact of COVID-19 has snowballed from the very initial health discourse to closures, to loss of jobs, businesses and funding, and to the final education product – quality of teaching and research.

4.3 COVID–19 pandemic, Uganda's higher education policy and the 4IR

The third objective and, therefore, research question this study sought to answer *was: What is the meaning of the COVID-19 pandemic to Uganda's higher education policy in the context of the prevailing 4th Industrial Revolution?*

According to McGinnis (2021) and Fomunyam (2019), 4IR refers to the current 21st century's socio-economic phenomenon in which there is a fusion of four realms – the physical, biological, digital and social – in the manufacture and provision of goods and services. This is in direct response to the chronological change from the immediate 20th century and its material-based economy (MbE) to the prevailing 21st century and its knowledge-based economy (KbE), according to Afua (2010). 4IR is also referred to as the knowledge-based economy (Shaddad, 2017; Kelly, 2016; Prisecaru, 2016).

What this means for Uganda's higher education policy regime is that the COVID-19 pandemic is a 4IR higher education phenomenon (McGinnis, 2021; Fomunyam, 2019; Wilen, 2018). It means that Uganda's higher education policy regime ought to understand that COVID-19 and 4IR are only some of the confluences of the 21st century to come to light (Salmi, 2020). Uganda's higher education policy regime must also comprehend the four realms constituting the novel 4IR phenomenon if they are to craft guidelines to address the various 4IR disruptions, such as those caused by the COVID-19 pandemic. This further means that Uganda's higher education policy regime ought to see that both the COVID-19 pandemic and the 4IR are phenomena of the new 21st century – one is biological, and the other is related to information and communication technology or digital.

4.4 Mitigation policy strategies

The fourth objective of this study and, therefore, the fourth question the study sought to answer was: *What mitigation strategies can Uganda's higher education policy regime adopt in responding to the disruptions of COVID-19 pandemic?*

4.4.1 Introduction

No doubt, Uganda's higher education policy is a critical ingredient of development. In the opinion of the authors, the policies Uganda's higher education governance will develop in response to the disruption to learning by the novel COVID-19 pandemic have direct implications for her stock of human capital and, therefore, her regional and global competitiveness. In the current 4IR economy of the 21st century, the knowledge, skills, attitudes and abilities needed for optimum economic productivity are viewed in terms of human capital (Wilen, 2018). As the WBG (2019 p. 9) argues, for example, "the nations of the world must urgently boost their investment in relevant education with 'a fierce sense of urgency' if they are to have the

unique human capital [knowledge, skills, behaviors and attitudes] demanded by the current 21st century and its 4th industrial revolution (4IR) job market". The term 'job market' is a loose synonym for the economy (Tan, 2014; Olaniyan & Okemakinde, 2008).

4.4.2 Funding

The very first strategic response by Uganda's higher education policy regime to the learning disruptions caused by the COVID-19 pandemic is financing. The authors believe that Uganda's higher education policy regime should boost her financial resource envelope, if it is going to fund the needed technology investment, human resource training and development needed to acquire and deploy new education technologies. Kajeet (2021, p.6) highlight the centrality of funding to higher education technology deployment when they posit that "[t]echnology requires funding and funding continues to be one of the biggest challenges facing schools".

In the view of the authors, the COVID-19 pandemic is a catastrophe which requires that the higher education policy team in Uganda seek and lobby for emergency funding to assist in absorbing the pandemic's disruptive shocks, especially the forced learning transition from physical, on-site learning to off-site, online, remote learning. As Salmi (2020) posits, "emergency funding is necessary in helping with the cost of the technology needed for a smooth transition to online education."

4.4.3 Disaster preparedness

According to Dell (2020), African universities (including Ugandan ones) had been "caught unawares" by the school shutdowns and the subsequent shift to online learning necessitated by the outbreak of the COVID-19 pandemic. In any case, few would have fully developed electronic learning systems and platforms such as Canvas and Google Classroom to implement high-quality digital learning environments (Khan, Niazi, & Saif, 2020; Dell, 2020; WBG, 2020).

The authors think that nothing more, or less, could be said of Ugandan schools, universities and other tertiary institutions (UoTI). For that matter, it is imperative that Uganda's higher education policy regime guides schools and higher education institutions to develop functional disaster management plans. Sharma (2020) reports that higher education institutions with disaster management plans handled the COVID-19 pandemic with more efficacy than those without. Even when the said pre-existing disaster plans were not tailored to COVID-19, reading from these plans tremendously helped higher education institutions in the United States of America (USA) and South-East Asia (SEA) prepare for the COVID-19-induced campus closures at short notice (Sharma, 2020). Sharma pointed out:

> These included university plans in the event of bushfires in Australia and California in the United States just before the pandemic and partly overlapping it; typhoons in the Philippines, earthquakes and tsunamis in Japan; and previous epidemics such as Severe Acute Respiratory Syndrome (SARS) in East Asia and Middle East Respiratory Syndrome (MERS) in South Korea. (Sharma, 2020, p.1)

In the view of the authors, the COVID-19 pandemic is a wake-up call to the effect that the threats facing humankind are, indeed, global in reach and extremely complex, thanks to the 21st century's 4IR phenomenon, and its characteristic fusion of the physical, biological, digital and social realms.

Whereas it is outside the purview of this study to pinpoint which Ugandan schools and higher education institutions have disaster management plans, the COVID-19 pandemic is a good rationale for Uganda's higher education policy regime to develop a guiding framework and give direction to its effect.

5.0 Discussion, Conclusion and Recommendations

5.1 Discussion

Uganda considers education, particularly quality higher education, to be the most powerful tool for the growth of all its other sectors; and education is labelled as one of the key components to drive social growth, economic development, and overall transformation. In the view of the authors, however, socio-economic activities and services such as education and training provision are not immune to disasters – pandemics such as the current COVID-19, natural ones such as floods, drought, and fires, or even made-made ones like climate change. Sharma (2020), for example, reports that in the light of the raging COVID-19 pandemic, higher education policy regimes must re-invent their funding, technology (ICTs) and disaster preparedness policies if they are to alleviate the disruptions to continuous teaching and learning.

Digital technology and ICTs in general were introduced to revolutionise learning and classrooms nearly 30 years ago since the mid-1980s, way before the advent of the COVID-19 pandemic (Kajeet, 2020). Despite genuine efforts, however, Uganda's higher education policy regime has not maximally exploited the potential of technology integration to meet the challenging needs of the current 21st century times, until the need to mitigate the disruption caused by the COVID-19 pandemic arose. As Prince (2020) argues, across the world, a consensus is emerging that schools and universities may have delivered in the past, but that these are certainly not working for today. These institutions were established in a different age and for a different set of purposes and using different teaching and learning modes altogether.

There is no doubt that ICTs are currently leading the way in Uganda's higher education policy efforts to restore operational normalcy in teaching and learning. However, like all the science and technology before it and the popular scientific method, ICTs are characteristically elite and segregative (Bonanno, Camarca & Pepinno, 2015). In the case of COVID-19, for example, it is mostly only the wealthy elite of the world who can afford the finances needed to acquire the technological devices and the software for the effective remote, distance learning as dictated by the standard operational procedures (SOPs) health officials have developed for containing the spread of the COVID-19 disease (WBG, 2020; Salmi, 2020).

5.2 Conclusion

- Uganda's higher education policy responses to the devastation and disruption to learning caused by the COVID-19 pandemic mainly depend on innovation in three areas: – funding, technology – specifically information and communication technologies (ICTs) – as well as disaster preparedness and readiness.
- Uganda's higher education sub-sector has suffered devastating disruptions directly arising from the advent of COVID-19. As Salmi (2020 p.4) writes, "The scale of the ongoing COVID-19 pandemic is unprecedented in the 21st century".
- The COVID-19 pandemic poses a direct threat to the continuous and equitable access to learning by all Ugandans. For that matter, radical (**but ethical)** policy innovations are needed to ease the disruption to learning access by the poor and disadvantaged rural populations, as well as the urban poor.

In the view of the authors, ethics, morality and truth might just be the biggest gaps in the present day Science, Technology, Engineering and Mathematics (STEM) agenda, as well as the popular scientific method, which is the basis of STEM (Bonanno, Camarca & Pepinno (2015). The ethics and morality gap can, for example, be seen in the current COVID-19 related allegations that the WHO and China have not been entirely truthful, forthcoming and ethical regarding the origin and global spread of the SARS-Cov2 pathogen responsible for the COVID-19 disease (Adams, 2021; Hounsell, 2021). The famous 20th century physicist Albert Einstein complained as much when he posited that "[s]cience is a sharp eye when it comes to tools and approaches but blind when it comes to values and goals". In the view of the authors, despite its popularity, STEM might need to redeem its image by embracing the Science, Technology, Engineering, Arts and Mathematics (STEAM) philosophy, instead. This is because the Arts in STEAM abbreviation caters for the needed ethics, truth and morality dimensions apparently missing in STEM thinking.

5.3. Recommendations

5.3.1 Funding

Uganda's higher education policy regime should lobby to be prioritised in the government's supplementary budget plans. The authors further propose that given Uganda's categorisation as an LDC with a small resource envelope, her higher education policy regime ought to strengthen its research and grant writing directorate to be able to proactively fundraise through developing world-class grant proposals to attract the badly needed funds from development partners and donors.

In particular, Uganda's higher education research and grant proposal writing unit should develop funding proposals targeting particular donors and funding agencies, both local and international. Kajeet, for example, provided some insight into this, albeit from the American context when they wrote: "The good news is that there are private foundations, local grants, and federal funds that can be used to fund or assist in funding off-campus connectivity". Kajeet went to provide a working model of how this might work when they posited:

> Many districts [in America] are already tapping into these funds to help close the Homework [learning] Gap by purchasing and developing new or existing technologies, enhance students' computer skills, offer professional development, increase parent involvement, and work with data to improve academic achievement for all. Initial funding to launch a programme is a great start, but there should be commitment to sustain it for the future. (Kajeet, 2021, p.6)

Thirdly, Uganda's higher education sub-sector could propose charging a token fee specifically aimed at strengthening remote learning infrastructure and educational technology deployment. However, the third option should be handled with caution as most parents/guardians of higher education learners are already needy and are surviving on less than a dollar a day, not to mention that COVID-19 has already devastated their income sources.

5.3.2 Information and communication technologies (ICTs)

The second strategic response Uganda's higher education policy regime should pursue in mitigating the disruptions to learning by the COVID-19 pandemic is the proactive acquisition and deployment of ICTs, together with related digital literacy skills (DLS) and devices for the teacher and learner stakeholders alike. In the view of the authors, online internet-supported teaching and learning is perhaps the most suitable method by which to ease the learning hiatus caused by the pandemic. This is because, given the stringent standard operating procedures (SOPs) of social distancing and related school closures for mitigating person-to-person infections, the COVID-19 pandemic might just have sounded the death knell for both the conventional physical lecture room/classroom and the libraries as both the custodians of the reading space and holder of the physical format books. It is difficult to imagine the level of COVID-19 transmission which would take place between readers sitting close to each other in a physical library's reading spaces, or through the exchange of physical books between the librarians and the users.

5.3.3 Disaster preparedness and management

Given the erratic nature of man's socio-economic activities due to the convalescence of the 4IR and the resultant multiple disasters, Uganda's higher education policy regime is safer with a strong disaster preparedness plan. As the old adage goes, 'failing to plan is definitely planning to fail'.

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A Systematic Review of Adaptable ICT Teaching Strategies on Teaching Process in Primary Teachers' Colleges in Africa

Annet K. Mugisha[1, 2], Jude T. Lubega[1], John P. Kasujja[1], Shallon Atuhaire[2, 3]

1. PhD, Nkumba University, Entebbe, Uganda

2. Teacher Education Department, Ministry of Education and Sports, Uganda

3. Cavendish University Uganda, Health Sciences, Kampala, Uganda

Abstract

Background: The use of adaptable ICTs in teaching and learning is the most critical factor that boosts the learners' interest. The use of ICTs in pedagogy in Africa is still low in primary teachers' colleges. Therefore, the study explored the extent to which adaptable ICT teaching strategies and learning activities influence teaching process in primary teachers' colleges in Africa.

Methods: Electronic databases, mainly Google Scholar and African Journals Online, were searched for relevant literature on mixed methodological studies that had been done on the use of adaptable ICTs in primary teachers' colleges in Africa. These had been published from 2014 to 2021. This period was considered with reference to when several governments in Africa emphasised provision of support in terms of ICTs. This focus was on infrastructure, equipment, and capacity building. The search strategy involved adherence to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for systematic reviews with focus on keywords and the general objective of the study. A total of 2,880 results was found when, 'use of adaptable ICTs in teaching and learning in Primary Teachers' Colleges in Africa from 2014 to 2021' was used to search. Of these, only 304 titles were relevant, while 92 abstracts were closely related to the study objectives. However, 51 were duplicates in the two databases; hence,

only 41 studies relevant by topic and date were exported into Mendeley; an online bibliographic management programme and were systematically reviewed for inclusion in the study. This is summarised in the PRISMA flow chart as will be indicated in the full paper.

Results: Integrating ICTs in teaching and learning process may cause powerful **learning** situations and promotes acquisition of knowledge, skills, and enables learners to be more constructive and self-directed. These include: shorthand computers, networks, satellite, software, and related systems that facilitate teaching and learning. However, their use is dependent on the perceived usefulness, ease to use, and attitude of both the teacher and learner. ICTs are critical in enabling individual learner to build new knowledge, especially when there is a challenge within the context. Equal access to ICT is not for all countries and this technological gap has consequences among the two categories of people: the rich and poor which is always referred to as the digital divide. If this divide continues in today's economy, individuals and families in some developing countries, such as those in Africa will remain at a disadvantage.

Conclusions: The effective technology use in teaching and learning is different from country to country because of the educational needs that have different variables. This calls for use of the available technologies in a way that will eventually transform the creation of knowledge and pedagogy towards producing a transformed citizen.

Keywords: Active teaching and learning, Adoptable ICTs, teacher education, technology

Background

The use of adaptable ICTs in teaching and learning is the most critical factor that boosts the learners' interest as revealed by 83.7% of the respondents in a study by Al-Shara (2015). The use of ICTs in pedagogy in Africa is still low in primary teachers' colleges. Currently, teacher educators in Africa have limited Information Communication Technology (ICT) skills, a situation that is likely to influence the use of Active Teaching and Learning (ATL) which largely requires one to use technology (Behar-Horenstein & Seabert, 2012). Active Teaching and Learning is a process of acquiring knowledge, skills, values and attitudes by any educational strategy that engages students in activities, such as debates, role plays, projects, and problem-based learning, instead of just putting them in the position of passively listening to the information given by the teacher (Mendes, 2019). Most Sub-Saharan African (SSA) countries have not fully developed their national ICT policies and these policies provide the foundation upon which ICT, both at the national level and at the educational sector level is set (Anderson & Kanuka, 1999). For those who have ICT facilities in place, many schools are struggling with their effective use, and government-led initiatives seem to mainly emphasise

capacity building for teachers both in initial and in-service teacher education pertaining to ICT use, (Hennessy & Onguko, 2010).

The integration of ICT is high on the educational reforms worldwide and in developing countries in particular. Education reforms in Ghana were launched in 2007 where computer literacy was introduced as a new subject and a tool to enhance teaching and learning. Despite the education reforms in education in Ghana, there is still a number of challenges that hinder quality teaching and learning. These challenges include inadequate ICT skills as well as infrastructure and human resource. In addition, teacher educators are resistant to change from traditional to modern methods of teaching (Agyei, 2014).

A study done in South Africa in 2017 indicated that even school administrators, as mediators of learning, do not use modern tools of technology in teaching and learning process probably because they have inadequate skills to use them. It was also noted that schools did not have adequate ICT infrastructure which denied learners an opportunity to employ modern means for information search (Tshelane, 2018). A study that was carried out in Malawi, Tanzania, Kenya, Rwanda, and Ethiopia highlighted teachers as critical drivers in the preparation of learners for a digitally-enhanced society. This is not only through transformation of the education system but also changing the teachers' role. In this process, the teaching profession is learner-centred and more interactive. For teachers to enhance active teaching and learning, there is a need for continuous professional development (CPD) for them to effectively manage digital tools and other resources (GIZ, 2021) .

The role of ICTs in enhancing communication, critical thinking, job creation, and innovation largely depend on how the teachers manage to deliver quality education. In order to achieve this, Đurek, V., Ređep, N. B., & eTransform

AFRicA (2016) recommend the following areas of intervention: teacher professional development, digital learning resources, and affordable technologies by respective governments. This will create an environment for Active Teaching and Learning which implies an active role of the learner in the process of achieving new knowledge or skills. This is usually associated with the term learning by doing. Pupils who actively engage with the materials are more likely to recall information later and be able to use that information in different contexts.

While available literature talks about evidence of the effectiveness of using technology in teaching, there is a knowledge gap about how ICT tools can be adapted to enhance active teaching and learning instructional strategy especially in primary teachers' college in Africa.

The integration of ICTs provides a variety of opportunities in the teaching process where the teacher has the capacity to incorporate, strengthen and interact with each learner even at wide geographical distance to achieve the desired learning outcome. ICTs enable access to learning, extension of knowledge and its transformation. Accordingly, learners share ideas in a multi-modal communication design. It supports the learner to share learning materials and spaces; promotes learner-centred approach; enhances critical thinking; and increases problem-solving skills and creativity (Ottestad, G., Mostert, M., Quinn, L., Ilomäki,

L., Noor-Ul-Amin, S., Shum, I. P., Kong, C. H., Fox, R., Majumdar, S., Cox, M., Abbott, C., Blakeley, B., Beauchamp, T., Rhodes, V., Length, F., Hennessy, S., Ruthven, K., Deaney, R., Wong, E. M. L., Hughes, J., 2008). Masterly of ICT skills by the teacher is not good enough, but also utilising these skills while teaching is vital to improve teaching and learning. However, studies done in various African countries indicate gaps in digital literacy and usage among teacher educators.

This study, therefore, explored the extent to which adaptable ICT teaching strategies and learning activities influence the teaching process in primary teacher training colleges in Africa. This is important in ensuring improved teaching in colleges; provides guidance on the best practices that may be adopted to improve the quality of teaching and learning in their respective colleges in Africa. The study was guided by a research question: To what extent can adaptable ICT teaching strategies and learning activities influence the teaching process in primary teacher training colleges in Africa?

Method

Electronic databases mainly Google Scholar and African Journals Online were searched for relevant literature on qualitative, quantitative and mixed methodological studies that had been done on the use of adaptable ICTs in primary teacher training colleges in Africa. These had been published from 2014 to 2021. This period was considered with reference to when the government of the Republic of Uganda emphasised provision of support in terms of ICTs. This focus was on infrastructure, equipment and capacity building. The search strategy involved adherence to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for systematic reviews with focus on keywords and the general objective of the study in the first step. A total of 2,280 results was found in Google Scholar and 18 in African Journals Online when, 'use of adaptable ICTs in teaching and learning in Primary Teacher Training Colleges in Africa from 2014 to 2021', was used to search. In second step, abstracts of these papers were analysed to determine their relevance to this study. Out of the 2,280 results analysed through Google Scholar, 15 were duplicates with 2,265 none duplicates. The 18 titles analysed through African Journals Online had 3 titles none duplicate and 15 papers were duplicated in both Google Scholar and African Journal Online. From Google Scholar and African Journals Online, there were 2,298 total titles read. From these studies, 304 were found to be relevant, whereas 2,282 were irrelevant; hence, discarded. From the 304 studies, only 92 abstracts were closely related to the keywords. Hence, they were critically analysed for inclusion in the study. However, 24 of them could not answer the study objective, hence, excluded. Finally, only 17 full studies were critically read, analysed and included in the study as indicated in Figure 1.

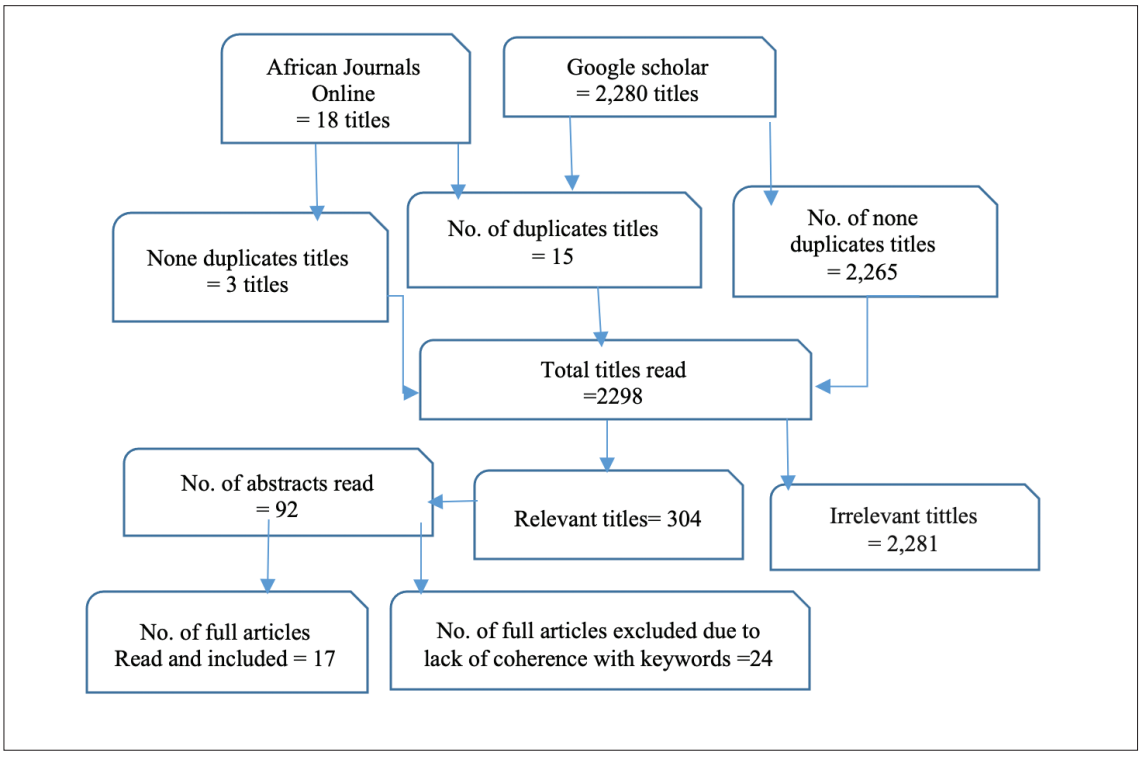

Figure 1: PRISMA flow chart

Results

Over the last decades, the integration of ICTs in the teaching and learning process has gained a solid attention in low and middle income countries. Its significant role in Teacher Training Institutions (TTIs) and in education generally cannot be downplayed. It is beneficial to both teachers and learners because it eventually produces citizens with 21st century skills who are digitally literate and adaptable to all life situations (Adarkwah, 2021).

In low and middle income countries (LMICs) specifically those in Sub-Saharan Africa, active teaching and learning suffer a number of challenges, including: inadequate number of teachers to meeting learning needs, and inadequate training and systems for continuous professional development. Given the above hindrances, several innovations have been done to address the challenges at hand. For example, Computer Assisted Instruction (CAI) tools were developed to guide the teaching and learning process in low and middle income countries (Kaye & Ehren, 2021). CAI refers to a software that can help the teacher to deliver a personalised lesson that is more interactive, enhances learning experiences to learners both online and offline in academia and other practices. The model indicated that operating environment, stakeholder engagement, infrastructure technological trust, CAI tool design, content curation/creation, student engagement, classroom integration, teacher and student capacity, data collection, and innovative changes promote continuous use of ICTs (Kaye & Ehren, 2021).

A meta-data analytical study by Agyei (2014) in Ghana provides a situational analysis of the pedagogical issues associated with ICT use in teacher education in Ghana. This is facilitated by investing in connectivity, Internet use, Liquid Crystal Display (LCD) projectors, specialised computer software, CPD for teachers, curriculum, pedagogical integration, and availability of ICT facilities in TTIs. These strategies are intended to skill teachers, enable access to ICT facilities, promote public-private partnership, innovations and improve the overall quality of the teaching and learning process.

In his participatory action research study in South Africa, Tshelane (2018) also emphasises the importance of the use of modern technology, Internet connectivity, and local digital content on enhancing active teaching and learning. These create an understanding and practice of critical leadership skills to address daily challenges in life.

In his review in Lesotho, Akkoç (2019) focuses on identification of challenges contextually-related to blended distance learning model. He encourages the use of ICTs, development of an educational policy on ICT, engagement of specialists and other stakeholders. Furthermore, in 2019, in his other review on Africa and Asia, he mentions that addressing the identified challenges requires the integration of computers, modems and CD-ROM in the teaching and learning process.

Baguma (2018) carried out a review in which he aimed at exploring how academics were integrating ICT into their teaching and learning practices at a university in Uganda. The importance of equipping TTIs with knowledge and relevant technological skills which would effectively support ICTs integration in teaching process is explained.

In 2021, GIZ carried out a digitalisation initiative review in five countries which include: Republic of Tanzania, Malawi, Rwanda, Ethiopia and Kenya in Sub-Saharan Africa. The initiative was a pilot that focused on the teaching profession and how education could be adapted to make a change on socioeconomic situations with a primary emphasis on digital skills development. The author indicates that the increasingly demand for the new competences in the workforce requires teachers to change their focus.

The importance of skills training and lifelong learning in enhancing teacher competences cannot be overstated since they are critical in the labour market. These would be facilitated by digitalisation, development of comprehensive and forward-looking policies, with good investment in digital technology, (Adarkwah, 2021). Other critical factors that impact digitalisation of education specifically on online learning are: the need for post-COVID-19 strategies for key policy makers in government that would promote e-learning education and a dependable educational reform vehicle to facilitate development. The reforms communication platform for and as a means to achieve the Sustainable Development Goal Four (SDG 4), student learning outcomes and social interaction (Adarkwah, 2021).

A review study in Ethiopia that aimed at evaluating the effectiveness of e-learning on the academic performance in mathematics, found out that online learning, blended e-learning and conventional learning strategy result in analytical skills, constructivism and generation

of new information in a teaching learning system (Tegegne, 2014). These require a strategy focusing on computers, statistical software, and visualised ICTs. In addition, there is a need to develop innovative teaching strategies for active teaching and learning to relate the data concepts with the authentic life circumstances, for instance, problem solving (Dushimimana & Uworwabayeho, 2020).

Combrinck and Mtsatse (2019) investigated ICT resources available for teaching and learning in South Africa, emphasising the use of predict paper-based literacy for Grade 4 and whether they were regular. This study also emphasises continuous professional development of teachers, and provision of ICT equipment for teaching, learning, and administrative purposes. These strategies would help to produce competent graduates in the global market, and give learners opportunities to support the communities. DVDs could also be used to blend learning, promote learner engagement, stimulate higher-order thinking and develop lifelong learning skills for future labour market (Mlotshwa, N., Tunjera, N., & Chigona, A., 2020).

When learners have domesticated the use of ICTs, they can discover other useful areas, such as online tutorials or videos, content specific websites, where learners can possibly be assisted in a particular area, concept, or any specified task. This strategy allows learners to use their thoughts before embarking to the subsequent learning level (Mlotshwa et al., 2020). However, this is dependent on their mindset which is critical in all life circumstances. Therefore, creation of a warm, caring and multi-dimensional classrooms, integration of collaborative learning practices and setting up of projects would nurture creativity, critical thinking, problem- solving, and responsibility skills (Rwothumio, J., Mbirithi, D. M., & Itolondo, W., 2020). Accordingly, an education framework that uses a flipped classroom model provides teachers with competency-based training to use such innovative strategies which has a bearing on learners' mindset. Hence, they are able to participate in creative activities (de Brabander & Glastra, 2021). Results are summarised in the Table 1.

Table 1: Adaptable ICTs teaching strategies and learning outcomes

Adaptable ICTs	Adaptable ICTs teaching strategies	Teaching/Learning outcome
• Computerassisted instruction • Internet use • LCD projectors • Specialised computer software • Modern technology, • Internet connectivity • Local digital content	• Operating environment • Stakeholder engagement • Infrastructure technological trust • CAI tool design • Content curation/creation • Student engagement • Classroom integration • Teacher capacity • Student capacity • Data collection • Innovative changes • ICT workshops • ICT integration across the university curriculum • Investing in ICTs • ICT pedagogical integration in different institutions at different levels in Ghana • Availability of ICT facilities • Teacher education institutions to include ICTrelated • courses in their programmes • Blended teaching	Ongoing use of ICT to improve the quality of teaching and learning • Skilled personnel • Access to ICT facilities • Publicprivate partnership • ICTs initiatives and innovations

Discussion

The results of this review vividly highlight the important role played by adaptable ICTs not only in active teaching and learning but also in the growth and development of any country (Adarkwah, 2021; Tegegne, 2014; Dushimimana & Uworwabayeho, 2020). The need for ICT-empowered human resource, ICTs to aid the provision of quality education system, use of constructivism concept in the teaching and learning process, availability and access to resources to support training and learner attitude and mindset are emphasised.

The global experience shows that effective technology use in education is different from country to country because of the education needs that have different variables. This calls for contextualisation and use of the available technologies in a way that will eventually transform the creation of knowledge and pedagogy towards producing transformed communities. In this regard, teachers need to re-think about the capacity and skills that are required by the learners to become more active workers in a knowledge-based society (Omwenga, 2015).

The present teaching-learning approaches in most Africa countries are teacher-centred and characterised by instructional pedagogy approach. In addition, the classes are very big, which affects the learning outcome; and as a result, the learners' performances and the feedbacks are usually undesirable (Halloluwa, 2011). Whereas active teaching and learning involves students' efforts to actively construct their knowledge, active learning involves working with other students on projects during class. They are required to do tasks, such as asking questions, making a presentation or contributing to discussions. They can also participate in a community-based project as part of a course; work with other students in the classroom or outside the classroom on assignments given to them. They could also join discussions on different ideas from a course inside or outside the classroom or tutoring peers. Bonwell and Eison define such approaches that stimulate active learning as, "instructional activities involving students in doing things and thinking about what they are doing" (Brame, 2015, p. 203).

The challenges that hamper the use of ICTs in teaching and learning include: access and availability of ICT facilities, connectivity, access to online materials and equipment, and change in the way teachers teach. These require refocusing of the teaching approaches, from teacher centredness to more transactional, self-learning and independence of students. Change has been majorly around the manner of learning and its process because this type of learning prepares the learners to confront the future (Bidarian, 2011, Tondeur, 2007). However, individual teachers lack desired skills; and in respect of this, ICT integration usually focuses on teacher competences and characteristics, for instance, skills and attitude towards computer use. This focus has shifted the blame from organisation to individual teachers (Tondeur, 2007).

With regard to the current pandemic, stakeholders in education have realised that the worst scenario presented by COVID-19 was the closure of schools where learners could not have face-to-face sessions, yet there was need for learning continuity. COVID-19 proved that ICT skills are crucial in developing learner-centred activities which could have been necessary during the lockdown when learners have been physically away from the teacher. During this period, most learners have been left out due to socioeconomic differences, and so have been the teachers. Teachers need training to competently provide online sessions. There is still a need for teachers to adjust to the digital learning platforms as solution to active learning where learners practice by themselves, (Gonçalves & Capucha, 2020).

Conclusions

Adaptable ICTs teaching strategies that encourage active learning are emphasised to develop learners' skills more than just conveying data. Learners need to be fully involved in activities that evoke critical thinking and problem-solving. The Active Teaching and Learning process is hampered by digitally incompetent teacher trainer. This demands for investment in capacity building for teacher trainers.

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Use of Simulation-Based Education (SBE) among Nursing Trainees and Trainers in the Context of COVID-19 at a Ugandan University

Florence Wamuyu Githinji[1],
Quality Assurance Unit

Judith Allsaints Apio[1]
School of Nursing and Midwifery (SONM),

Hilda Mpirirwe[2]
School of Business and Applied Technology

Alimah Komuhangi[2]
Institute of Public Health and Management (IHPM)

Clarke International University, Uganda

Abstract

Background. With the rapidly rising morbidity and mortality caused by the coronavirus disease 2019 (COVID-19) pandemic and severe disruption to the education sector, most universities in both developed and developing countries are grappling with finding new ways to learn and teach. One approach would be simulation-based education (SBE). But this approach is understudied in many settings, including Uganda. In this study, we report on the experiences and perceptions of nursing students and teaching faculty about SBE in the context of COVID-19 at Clarke International University, a private university in Uganda.

Methodology: The findings revealed that nursing trainees showed high levels of enthusiasm and positivity with the SBE. They reported that the SBE offered a good learning opportunity and acquisition of skills in a safe environment. The teaching faculty reported SBE demonstrated real-life events to students, eliminated anxiety, and built the confidence of students for better clinical practice. Three themes emerged: SBE facilitates gain of confidence and reinforces memory; participating in SBE improves skills, judgement and critical thinking; and SBE fosters teamwork and interdependence. The use of SBE is a great strand of integration within educational practices.

Keywords: Simulation-based education, nursing trainees

Introduction

Virtual and open distance learning platforms have been adopted in both developed and developing countries, including several nursing training institutions to ensure continuity in learning (Ching, 2020; Konrad, Fitzgerald, & Deckers, 2021; Tabatabai, 2020). Mixed reports have, however, been made on the ability of these learning platforms to foster clinical acquisition of skills, which is one of the major components of nursing education. Because a large proportion of the nursing curriculum is dedicated to acquisition of skills, institutions must find innovative ways of fostering this aspect of learning in the new norm of virtual education. Simulation-Based Education (SBE) has been utilised in nursing education for some time (Martins, 2018), and although well established in resource-rich settings, limited experience exists in resource-poor settings (Najjuma, Bajunirwe, Twine, Namata, Kyakwera, & Cherop, 2020).

SBE is a technique aimed at replacing or amplifying real-life experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner (Gaba, 2004). As a pedagogical strategy, it helps students to consolidate and value knowledge, while developing critical technical, relational, thinking and reflection skills that contribute to training of competent professionals. Furthermore, it provides a safe environment for students to practise before they can be exposed to real patients (Martins et al., 2018). At the beginning of July 2020, the higher education institutions (HEIs) in Uganda were reopened using a staggered system and with strict adherence to COVID-19 prevention measures. This called for blended teaching and learning. To foster continuity of learning, Clarke International University adopted the use of an open distance e-learning platform (Moodle), together with the use of video conferencing tools, such as Zoom and Google Meet. In the School of Nursing of Clarke International University (CIU), SBE was considered to provide students with opportunities to practise their clinical and decision-making skills through various real-life situational experiences. Students were also asked to carry out practical assignments from home and upload them on the platforms or send videos and photos of the work done for evaluation purposes.

SBE has been found to have a number of benefits. It has been shown to increase students' levels of confidence and skills acquisition, and their preparedness for clinical placements (Baillie & Curzio, 2009; Penman, A., Hill, A. E., Hewat, S., & Scarinci, N.i, 2020). Students have also reported that SBE supports clinical skills development and those simulated cases may replace real patients during practical examinations (Joseph, N., Nelliyanil, M., Jindal, S., Utkarsha, U., Abraham, A. E., Alok, Y., Srivastava, N., & Lankeshwar, S., 2015). Virtual SBE also allows for learning to move to a virtual environment; and changed the traditional time-consuming manual processes of creating an integrated approach for improving nursing outcomes. It increases learners' ability to access nursing scenarios using computers and mobile devices at any time; and the nursing educators have the ability to run live case-based simulated training from anywhere (Tabatabai, 2020). There have, however, been challenges with SBE, such as inadequate infrastructure, lack of clinical simulation management software and hardware, cloud-based e-Learning and virtual patient training. Moreover, simulation is still a novel strategy, especially in resource-limited settings (eCastro & Lucchetti, 2020; Tabatabai, 2020). In this study, we report the experiences and perceptions of nursing students and teaching faculty about SBE in the context of COVID-19 at Clarke International University.

Methodology

This was a pilot study that employed a qualitative method of data collection. Data was collected through focus group discussions and key informant interviews that were held four weeks after the simulation exercises. Seven third-year nursing students who had completed simulations and two key informants, the faculty and clinical instructors, were purposively sampled to participate in this pilot study. Of these, six were female and one was male, reflecting gender disparity in a typical nursing class (O'Lynn, 2004).

A focus group discussion (FGD) guide and a key informant guide were developed to collect data from students a month after the last simulation exercise. The respondents shared their experiences on the simulation exercises, acquisition of skills, and debriefing sessions and generally their perceptions of SBE as a learning method. At CIU, there were three common nursing procedures at a skills laboratory. These included: making a bed for a post-operative patient; performing a general and pelvic examination on a female who presented with a history of lower abdominal pain and vaginal bleeding; and resuscitating a newborn with birth asphyxia.

Data was entered in Microsoft Excel and a thematic analysis was conducted Nowell, Norris, White, & Moules, 2017). It was coded and then, reading through it, emerging themes were identified from which sub-themes and their representative quotes were obtained.

Results

Three themes emerged from the data analysis. (1) SBE facilitates gain of confidence and reinforces memory; (2) participating in simulation-based learning improves skills, judgement,

and critical thinking; and (3) SBE fosters teamwork and interdependence. We describe the details of these findings below.

SBE facilitating confidence and reinforcing memory

All the participants expressed that this form of training helped boost their confidence in executing nursing interventions. Some participants explained that they made some mistakes during the simulations but because they were encouraged and had a chance to repeat those scenarios, they lost the fear that they had. Positive feedback and criticism from both the instructors and peers during the debriefing sessions were seen as an encouragement and gave participants a chance to identify where they had gone wrong and reflect on what they could have done better. One participant said: "The debriefing was very encouraging. Our confidence levels were boosted. We got to learn how to improve. Listen to other people's opinion - what they would have done differently. You get to know where you messed up, and improve. We identified our own areas on how to improve" (R001). The sharing of feedback and the idea that one can still come back and practise even after failing was seen as motivating and morale-boosting as expressed by another participant: "It energises and gives courage that you can still come back. You are told about your mistakes and where to improve and what has to be done; this gives morale. Without feedback you lose hope and motivation. Students get encouragement that next time they can still come back and practise. I think simulation should be part of the university's way of learning" (R002).

Furthermore, the participants described how the exercises improved their memory and retention of concepts and skills. The act of practically carrying out a procedure and repeating it as many times as one wanted was seen as one way in which skills would not be forgotten and those skills would easily be applicable when faced with a real patient in a clinical setting. One participant had this to say: "It stays on the mind for long after you have practised and it is easier to perform procedures on real patients after you have practised" (R003). SBE was also described as being relatable and less abstract, as theoretical concepts learned in class could be visualised.

This was in line with a key informant who reported: "The simulation scenarios were developed by faculty in increasing complexity and were aimed at equipping students with skills in bed care and preparation to receive a post-operative patient back on ward, patient assessment and communication with an adult female who presented with lower abdominal pain and vaginal bleeding; and the resuscitation of a newborn."

Improving skills, judgment and critical thinking

Students noted that their experiences from the simulation exercises were helpful in acquiring skills and applying those skills to real patients on the ward. They noted that without practice, one would never know what to do in the clinical area. So, simulations help build that experience ahead of a real clinical placement. A participant said: "It equips you to handle a real-life situation. Before you have done it, you are not sure what will happen on ward but after,

you can actually do it for a patient. It feels real" (R005). Students also saw it as an engaging, exciting, and stimulating way to learn that increases the number of skills acquired and makes their mastery easy. One student explained: "I was having issues with cannulation and the instructor mentioned that, 'don't go so deep, that's a superficial vein', and I did it, and then I thought, oh, it's this easy" (R007)! Simulation-based learning was seen as helpful where students may not have adequate time or have limitations in accessing clinical sites and was also described as being an alternative to clinical placements. Students explained that some of the cases that might not be found on ward can be simulated in the laboratory, thus, exposing them to more, as one student commented: "We do not have much time in the clinical area and it has been worse in this lockdown. The simulation helps you to have an idea because even if you have not been on ward, you still have a clue" (R002). Participants also reported that they were able to learn the ideal way of executing skills which might not be the case on the wards due to insufficient supplies to use. One student remarked: "I learnt skills of preparing a post-operative trolley and doing ideal things" (R001).

SBE was also seen as fostering clinical judgment and developing critical thinking skills. Students described the scenarios as thought provoking and that the briefing sessions gave them a chance to stop and reflect, and then think about what the scenarios needed and what preparations they had to make. During the simulation activities, some participants expressed being under extreme pressure as they tried to recall what they had studied and that they had to think fast. A participant stated: "…me I liked how the last simulation was, where xxx kept commentating and engaging and it felt real, you even become sharp at thinking." (R004).

Fostering teamwork and interdependence

All the students mentioned that SBE helped them appreciate the value of teamwork and depending on each other. During the exercises, they realised that they could not work independent of one another for all the three simulations they participated in. They also described that they appreciated the role and responsibilities of each member of the team and that it was important to have a team leader as one participant explained: "You also learn how to depend on each other. You get to know that you can't work alone. It was interesting you even need a team leader for some scenarios" (R006). Working together was seen as a means of simplifying work; and with a team leader around, there was less disorganisation and time wasting: "The last simulation we had, each of the four of us had our own role and responsibilities and we managed to work really well in a very coordinated way" (R004).

Teamwork and interdependence was elaborated by a key informant who explained how the simulations were carried out: "All the simulations followed the three phases of simulation which included the briefing, action and debriefing sessions. They were carried out two weeks apart in the School of Nursing and Midwifery skill laboratory where spaces were organised to represent a patient's room, an outpatient's office and a resuscitation corner. Space was also availed for the debriefing session. For the first scenario, two students were instructed to make a post-operative bed in preparation to receive a patient from the operating room. For

the second [scenario], one student acted as the patient while another performed a physical examination on her to assess for lower abdominal pain and vaginal bleeding. Finally, in the third scenario, four students participated in resuscitating a newborn with birth asphyxia. A baby mannequin was used with specific roles assigned to each. In all the scenarios, students were asked to perform their tasks as though they were with real patients in a hospital setting"

Discussion

Results from this study show that the participants expressed that SBE helped boost their confidence in executing nursing interventions, while some reported that they made some mistakes during the simulations but because they were encouraged and had a chance to repeat those scenarios, they lost the fear that they had. This is in line with Mitchell, Newall, Sokol, Heywoo and Willim (2020), who reported that simulation training was considered an acceptable and worthwhile method of training since it increased perceived confidence in managing clinical aggression. In line with earlier findings that simulation has the potential to improve psychomotor, affective, and cognitive skills while allowing students the ability to engage in significant deliberate practice (Parker, McNeill, Pelayo, Goeik, Howard, & Gunter, 2011), the respondents described how the exercises improved their memory and retention of concepts and skills. This implies that simulations build confidence for real practice in the real world. Therefore, nursing institutions and other health training institutions should not miss out on the opportunity to invest in SBE.

The students described that their experiences from the simulation exercises were helpful in acquiring skills and transferring those skills to real patients on the ward. This was consistent with Mitchell et al.'s (2020) study findings that the opportunity to rehearse and practise skills in an environment which closely resembles reality and develop critical thinking and clinical reasoning is achieved through SBE. The current study has demonstrated that SBE helped the respondents appreciate the value of teamwork and interdependence, thus resonating with Yang, Yang, Haung, Liang, Lee, Cheng, Haung nad Kao's (2017) findings, where health care simulations are recognised as an ideal vehicle for inter-professional education, since it enhances coordination, communication and teamwork. In real nursing practice, teamwork is one of those fundamental skills required. Therefore, if SBE shows that teamwork can be achieved, it can be categorically stated that SBE is indeed a necessity in nursing practice.

Conclusion

SBE builds confidence in students through individualised learning. This boosts optimum performance in real medical practice since students are able to get immediate feedback via a series of repetitive practice learning. The study has found SBE to be favoured by both students and faculty representatives; thus, offering an alternative approach to teaching and learning during the COVID-19 pandemic, a time for strict adherence to pandemic-related standard operating procedures (SOPs). SBE has a learner-based centered approach in teaching and learning; therefore, there is a need to incorporate SBE into the nursing education curriculum.

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From Business to Service: A Call for Strategic Remediation of Higher Education Lag during COVID-19 Pandemic through Competence-Based Education

Richard Kasirye[1], Muhamadi Kaweesi[1], Dennis Zami Atibuni[1*], David Kani Olema[1]
[1] *Department of Education, Faculty of Science and Education, Busitema University, Uganda*

* Corresponding author email: zamidennis79@gmail.com

Abstract

The evidence of a quality higher education system is the quality of graduates as revealed by their competence in the world of work. Before the outbreak of COVID-19 in 2019, the generation of graduates of higher education institutions in Africa in general, Uganda inclusive, was perceived as wanting with regard to accountability, control, compliance and improvement. They were noted to offer less value for money, fitness for purpose, and quality service delivery and transparency in the world of work. Their legitimacy, integrity and standards when compared across the board were often questioned. With the outbreak of the COVID-19 pandemic, higher education has faced unprecedented challenges, especially given the fact that a large fraction of the higher education institutions, programmes and students are privately sponsored, depicting a business rather than service model of operation. It is observed that the pandemic has exacerbated the predicament of higher education by causing irrevocable disruptions and a general lag in curriculum, pedagogy, resources, appraisal and feedback systems of

courses taught to students. This conceptual review article examines the need to adopt a service model in preference to a business model in providing higher education characterised by technology-enhanced innovations among students and faculty to enhance competency and productivity in the face of COVID-19 restrictions. The article further proffers strategies to mitigate the challenges of providing higher education on a business model. We argue that a deliberate move by all stakeholders to adopt a competency-based curriculum is both essential and desirable to improve the quality of higher education provision. We further argue that the provision of higher education on a business model does more disservice than good to the quality of the higher education system and, hence, its graduates. We recommend a multipronged approach to tackling the menace of the business model while advocating a service model in the provision of higher education.

Keywords: Business model, competence-based curriculum, competence-based education, COVID-19, higher education, service model.

Introduction

The outbreak of the coronavirus pandemic in 2019 led to the lockdown of education institutions, raising concerns about the future of education, particularly in least developed countries where learning is predominantly fostered by face-to-face interactions between teachers and learners. Just as in other countries, Uganda's public and private higher education institutions (HEIs) have suffered effects of the pandemic with uncertainty of when normalcy will be restored to resume uninterrupted learning. The budgets of HEIs have been grossly constrained because of either an extended academic year or reduced levels of enrolment. The global prevalence of COVID-19 has provided a critical test of the relevance of higher education programmes in producing graduates with competitive job-related skills. The organisations that provide employment to the graduates are shifting to the mode of operation that requires fewer workers with competent skills. This phenomenon requires that managers of HEIs study and adopt tested interventions to improve the quality of their products and intake numbers.

Post-COVID-19 period threatens to pose more challenges of compensating for the time lost during the lockdown, the readiness of the learners and the quality of learning. Some students with access to technological devices and knowledge have continued learning despite the lockdown yet their counterparts stopped studying when schools were closed. Therefore, students who have sustained studying during the lockdown might have a feeling of being dragged behind even when they have the required competency to progress to the next level. This calls for HEIs to rethink shifting to competency-based education (CBE) model and to integrate affordable technologies into the general semester system or to adopt a non-termly system where progress is determined by the acquisition of competencies than the completion of an academic year (Desrochers & Staisloof, 2016).

By adopting the CBE model, HEIs will be more able to design efficient content, reduce the cost of content delivery and make education programmes more affordable to the learners and parents who have been hit by the effects of the pandemic (Staskevia, 2019). The competency-based model tends to describe the combination of specific knowledge, skills and personal attributes that enables someone to perform a task. CBE is used interchangeably with competency-based curriculum (CBC) in this study to refer to education programmes geared towards producing graduates who not only have knowledge but also can apply it in complex jobs and life-related situations (Klein-Collins, 2013). The adoption of CBE facilitated with technology will, among others, foster lifelong learning, whereby institutions can develop programmes for both formal and non-formal career paths, promote accountability (Brightwell & Grant, 2013) and enable institutions to enrol students throughout the year without being limited by the space or geographical location of learners. In this conceptual review paper, we examine the need to adopt a service model in preference to a business model in providing higher education characterised by technology-enhanced innovations among students and faculty to enhance competency and productivity in the face of COVID-19 restrictions.

The CBE model is underpinned by the constructivism theory that focuses on the centrality of the learner in organising and undertaking education activities or programmes. Constructivists believe in learners constructing knowledge through active engagement in authentic activities (Bartram, 2005). Geen and Gredler (2002) reveal that when learners are given clear goals for their learning and left to explore knowledge on their own, they will be able to develop skills and competencies. This will make learning more meaningful because it facilitates learners to apply content in an authentic work-related environment.

Kiguli *et al.* (2011) reveal that a shift from content-based education to the competency-based curriculum in universities of sub-Saharan Africa has been slow. The current study was intended to fill this knowledge gap by amplifying the need to adopt CBE in HEIs in Uganda as a remedy to the hiatus created by the COVID-19 pandemic. The researchers undertook a systematic literature review of both white and grey literature on business and service models of education provision, competence-based curriculum, competence-based education, approaches and strategies to teaching and learning during COVID-19 and emergencies, and higher education provision. The review resulted in a synthesis of the historical perspective of CBE, a rationale for shifting from the business to the service model of provision of higher education, strategies for adopting CBE in HEIs, benefits of adopting CBE, challenges faced in implementing CBE, strategies for mitigating the challenges of providing higher education on a business model, and limitations of the paper.

Historical Perspective of CBE

Initially, CBE was majorly designed for adult learners, but has become an innovation attracting institutions to design and offer it across the board (C-BEN, 2015; Fleming, 2015; Public Agenda, 2015). Increased interest by the U.S. Federal Government to fund and support higher education opportunities for adults working in the 1970s led to the development of several CBE degree

programmes (Klein-Collins, 2013). Later, the CBE philosophy was institutionalised in some national qualification frameworks that included the United Kingdom, the Republic of Ireland, The Netherlands and Germany (Mulder & Eppink, 2011). As such, CBE is not new since it has been applied by international development agencies and consultancy firms for capacity building and strategic planning in Latin America, Asia and Africa.

Ford (2014) observes that recent calls for increased productivity, effectiveness and demonstrable outcomes from the education sector prompted expanded global interest in the development of competency-based education initiatives. According to Ford, the sixth generation of CBE models is characterised by online learning, study analytics, adaptive technology and direct assessment. There are three different levels of the use of competencies, which include those related to training, education and development (Mulder & Eppink, 2011). Since our study focuses on higher education and preparing graduates for the competitive world of employment, the study will concentrate on integrated occupations associated with competencies at the education level. At this level, knowledge, skills, values and attitudes are integrated during the learning process and authentic assessment is administered to determine mastery of job-related competencies (Wesselink, 2010). In 1996, the Conference of Education Ministers of Francophone Countries summit in Yaounde, Cameroon, recommended that member countries adopt competency-based approach (CBA) reforms (Bernard *et al*., 2007). Education reforms based on CBA were carried out in the 23 West-African countries with support from the organisation.

Within the East African Community (EAC) member states (Uganda, Kenya, Tanzania, Rwanda, South Sudan and Burundi), each country took a different approach in adopting CBC, mainly focusing on inclusion of the 21st century skills in the curricula and at different levels of education. For example, Kenya started implementing CBC in pre-primary and lower primary in 2018 (Muasya & Waweru, 2019) while Uganda reformed her education from the content-based to the competency-based curriculum in lower secondary in 2020 (National Curriculum Development Centre [NCDC], 2020). Attempts have also been made to integrate the competency-based curriculum particularly in business, vocational and technical education. For example, the Business, Technical and Vocational Education and Training (BTVET) Department, supported by the German Agency for Technical Co-operation (GTZ), set up the Uganda Vocational Qualification Framework (UVQF) secretariat in 2004 to monitor the implementation of competency-based education and training (Kyobe & Rugumayo, 2005). This was intended to link vocational institutions with the industrial sector by integrating job-related competencies into their curricula. It is anticipated that a shift to service rather than business models of education innovations such as CBC will provide competencies that are frequently associated with the workforce needs required by employers (Kim, 2015) and also help countries to attain global development targets. However, there is a dearth of scientific evidence of the competency-based curriculum (CBC) or competency-based education (CBE) and programmes in higher education (Mbarushimana & Kuboja, 2016).

Rationale for Shifting from Business to Service Model of Education through CBE

Mbarushimana *et al.* (2016) note that education institutions of many developing countries produce graduates with limited skills demanded by society and the employment market. These authors agree with Mulder and Eppink (2011), who observe that education in Uganda and Ethiopia is generally offered with limited attention to the development of work-related competencies. Further, Staskevia (2019) reveals that the current education acquired through a business-oriented content-based curriculum is important but not sufficient to produce graduates with competitive skills ready to serve in the employment market. The above studies indicate the need to improve the quality of education by either adopting education reforms that have been tested elsewhere or rebranding their curricula, teaching and assessment.

Studies have revealed that the adoption of CBE improves the quality of education since learners can acquire demonstrable competencies in real-life situations (Desrochers & Staisloof, 2016; Kabanga *et al*., 2018; Kafyuililo *et al*., 2012; Makulova *et al*., 2015; Mulder & Eppink, 2011; Simonds *et al*., 2017; Staskevia, 2019; Wambua & Waweru, 2019). However, Porter (2014) questions the criteria applied in determining the prior knowledge to include in the competency-based programme, what constitutes a term in a self-paced programme, and how progress is determined. These studies were either limited to developed countries, small sample sizes, a few programmes, or newly established programmes. Therefore, this calls for a critical review of literature related to CBE implementation, challenges and mitigation before adopting it in higher education as a solution to the negative effects of COVID-19.

Strategies for the Adoption of CBE in HEIs

The COVID-19 pandemic has left many learners, parents and education institutions in Uganda very uncertain about the future of education. There is seemingly very limited opportunity, if any, for many learners to continue with studies, largely due to the technology divide. Institutions are faced with the challenge of administering quality online examinations that are free from any form of malpractice to the digital natives who can get answers online with a mere click of the mouse. It is also not easy for institutions to convince some parents to pay tuition for another academic term when the previous term ended prematurely and the learners are at home where online learning may not be considered as a justifiable cause to pay tuition. Most higher education institutions are also working at half capacity yet the cost of running programmes has remained the same. All these challenges require a shift from construing education as an ongoing service process rather than as a one-time affordance as a business product.

Some students have been exposed to online education resources and acquired requisite skills in certain subject contents in given terms or semesters, but are unable to progress due to the COVID-19 lockdown. A critical intervention with more focus on the acquisition of competencies than consideration of the time spent to complete a particular programme is

required in higher education to enhance teaching and assessment. Therefore, in situations where education produces graduates with limited job-related skills (Cheptoo, 2019), teaching staff and university managements need to rethink and orchestrate a strategic shift to quality CBE programmes with active learner-centred approaches and assessment of competencies to increase the productivity of the graduates (Desrochers & Staisloof, 2016).

Several studies conducted in different countries provide hope to higher education institutions that the challenges brought by COVID-19 can be honed into opportunities to reduce operational costs, check the quality of the programmes, and increase student enrolment. Studies related to the CBE model reveal that proper planning and allocation of resources lead to the preparation of efficient content and reduces the cost of delivery and training per student in higher education institutions (Desrochers & Staisloof, 2016). There are three core components of the CBE model, and these include price, efficiency and scale. This implies that the programmes designed should be affordable to learners in terms of paying tuition and other related costs, provide essential work-related skills for them to get employed fast, and improve intake at the leaners' convenience.

Transitioning to CBE is a reform that will involve designing and implementing education programmes focusing on learners acquiring the desired performance in terms of knowledge, skills and attitude to fit into the competitive world of employment (Josephsen, 2014). Higher education institutions need to design programmes whose complexion is not limited to the time spent in the course but the competencies learnt. CBE programmes can be designed to allow students to pay tuition per credit hour or module or for a set of competencies to make education affordable rather than paying for a whole semester, as is the case with the learn-on-demand programme of the Kentucky Community and Technical College System (KCTCS) where students pay per credit hour (Desrochers & Staisloof, 2016). In terms of scale, CBE models have the potential for individualised progress after acquiring the required competencies, which creates room for admissions throughout the year. For example, the University of Wisconsin offers flexible enrolment options for general studies, health, information communication and business every second day of each month while KCTCS enrols anytime. The MyPath programme offered by Brandman University enrols students for the business course every Monday and Tempo Learning by Walden University offers enrolment for early childhood studies every first Monday of each month (Desrochers & Staisloof, 2016).

Benefits of Adopting CBE in Higher Education Institutions

Studies from four institutions suggest that CBE programmes have chances to reduce instructional delivery costs and fast demonstration of mastery of content by the learners (Desrochers & Staisloof, 2016). Comparison of the traditional credit unit of four institutions with their own CBE programmes, the affiliated Carnegie sector and Western Governor University shows a decrease in total percentage expenditure per student by 48%, 67% and 21%, respectively. However, these authors note that the changes in instructions require huge investment per student by the institutions, particularly at the initial implementation of CBE.

Therefore, institutions need to carefully plan for financial resources that can sustain CBE programmes, otherwise these programmes may be prematurely closed before the break-even point. Their findings indicate that financial returns from the initial investment in developing CBE will be low, particularly when student enrolment is still low, but better returns are expected as the number of students steadily increases from the break-even point. In the long run, the anticipated benefits will include institutions working at half the cost of the traditional academic programmes, improved institution's reputation, marketability of programmes, and increased graduate employability, among others (Desrochers & Staisloof, 2016).

Desrochers and Staisloof (2016) also emphasise that CBE provides an opportunity to adopt technologies that facilitate the education of many students without facing challenges of teacher-student ratio, compromising quality, and reducing labour cost. The integration of technology is further envisaged to increase student enrolment and learning space, and to lower the cost of running institutions (Klein-Collins, 2013). However, as more new courses are rolled out with emerging increased student enrolment, marketing and student support services will be needed, requiring a big percentage of the institutions' budgets (Desrochers & Staisloof, 2016).

The CBE model develops students' attitudes and skills, improves the quality and effectiveness of teaching, and develops the standard of learning and service to society (Staskevia, 2019). Through CBE, learners are able to acquire knowledge, skills and attitudes that enable them to find solutions to new problems (Makulova *et al.*, 2015), which otherwise would remain a puzzle in content-based education. These competencies have become standard measures for the quality of education (Klein-Collins, 2013). The competency-based curriculum as an education reform provides accountability to the learners, parents, school owners and employers in terms of what learners need to know and do in varying and complex situations (Kafyuililo *et al.*, 2012; Wambua & Waweru, 2019). This model also provides an opportunity for adults to relate working experience with learning, flexible time scheduling and personalised progression, depending on the competencies acquired (Kelchen, 2015). Ford (2014) similarly observes that CBE programmes help students to graduate fast and reduce costs for students and institutions. All these studies indicate that through the adoption of CBE programmes, the quality of education can be improved. Mulder and Eppink (2011) reveal that all those who first enrolled in CBET-designed diploma and certificate programmes in horticulture accessed jobs immediately after completion of their courses. Kabanga, Mugimu and Oonyu, in their 2018 study, reveal that the CBE content for nurses and midwives was appropriate in addressing the knowledge, skills and attitude gaps and thus improving the quality of their professional practice.

Cheptoo (2019) observes that African states will be able to attain the 2030 Sustainable Development Goals (SDGs) and Africa Union's Agenda 2063 when they adopt CBE according to the African context. The author further emphasises the need to align Africa's needs to the well-documented curriculum designs from developed countries, but focusing on African

philosophy and the African vision. All the reviewed literature reveals that CBE has the potential to improve the quality of learning (Desrochers & Staisloof, 2016). Therefore, this presents an opportunity for HEIs to exploit CBE innovations to link content with the competencies required at the workplace.

Challenges in Implementing CBE

Several authors have revealed varying challenges faced in implementing CBE programmes, including those related to institutions, teachers' preparedness for change, time, the curriculum and students. For example, Wambua and Waweru (2019) and Komba and Mwandanji (2015) reveal that the majority of teachers surveyed in their studies were not well prepared to apply the new teaching and assessment techniques required for effective implementation of CBE. Teachers lacked concrete information and the practical examples required to develop appropriate methodology for CBE teaching (Tromp & Datzberger, 2021). Muasya and Waweru (2019) intimate that hurried institutionalisation of CBC with limited funding from the government and institutions negatively affects its implementation.

Students who participated in Simonds *et al.*'s (2017) study reported that CBE courses helped them to solidify their learning but needed more time management compared to the traditional course structure. The students further reported that it was challenging to adjust to the grading based on the achievement of several goals based on a grading rubric rather than the traditional use of a single-letter grade. One of the interviewees observed that the CBE curriculum content did not break down the competencies to be achieved in a semester but rather in the entire year, which made implementation depend on the facilitator's plan (Kabanga *et al*., 2018). Therefore, effective adoption of CBE models requires a clear definition of the competencies to be achieved in the programme course and to develop and communicate measurable performance indicators or standards to all the stakeholders (Staskevica, 2019).

Accreditation bodies and student financial aid regulations also pose another challenge to innovations and the realisation of the effectiveness and productivity of higher education institutions' potential that CBE brings (Kelly & Hess, 2013; World Health Organisation [WHO], 2013). Ford (2014) observes that the current higher education regulatory bodies tend to misalign with the CBE notion of mastery of demonstrable competencies and instead consider seat time to determine the progress of the learner. CBE presumes that different learners can progress at different times depending on how fast they can master the demonstrable competencies required for that particular programme. The majority of institutions in the USA have been prompted to incorporate competencies into the credit unit system and time to meet the requirements for student financial aid regulation and accreditation (Ford, 2014). Porter (2014) identified some of the challenges colleges and universities faced in meeting student financial aid regulation requirements, and these included how to determine the full-time or part-time students, a definition of what constitutes a term in self-paced learning, and how to determine the progress of learning. These challenges can also be seen in the Ugandan context where the National Council for Higher Education (NCHE) regulates majorly on-seat time of curricula

or programmes of HEIs. Therefore, the effects of COVID-19 on the progress of the education sector require the regulating bodies to relax some of their policies so that innovations such as CBE can be effectively implemented.

Effective implementation of CBE is also affected by large class sizes coupled with inadequate teaching and learning materials, as well as ill-prepared teachers (Cheptoo, 2019; Nederstigt & Mulder, 2010; Tambwe, 2017). In some institutions, the student-lecturer ratio has risen to 1:800 from the 1:50 ratio recommended by NCHE (NCHE, 2014) in core courses in the HEIs. This is more likely to affect the lecturers' capacity to design learning activities, monitor, assess and record the competencies attained by every student. Some teachers have been unable to use learner-centred approaches either because of big numbers of students or resistance to change since they were not exposed to such approaches during their pre-service training. They are sometimes unable to conduct regular assessments as required in CBE because they are overwhelmed by the student population. HEIs need to mind the quality of the teaching and learning process by instituting the recommended class size, and to integrate automated grading so that feedback is provided instantly. Although this comes with the extra cost of recruiting or paying allowances for the extra lectures or lessons, it is worth the extra expenditure to safeguard and improve the quality of the teaching and learning process.

Another challenge to the development of the CBE curriculum is the nature of standardised summative assessment (Mastercard Foundation, 2019). Establishing standardised competencies to assess learners from institutions with autonomous powers is challenging compared to institutions that subscribe to a uniform assessment board. For example, each university develops different courses and assessments, thus producing graduates with differing competencies. There was limited documented research available about the National Qualifications Framework (NQF) in Africa, which would have facilitated institutions to align their education programmes and assessment to the required competencies (Murararaneza *et al.*, 2016; Mastercard Foundation, 2019). Such frameworks are a necessity for learners to acquire competencies that can enable them to advance their careers beyond their country and also promote lifelong learning. Kiguli *et al*. (2011) reveal that in some institutions where CBE is implemented, there is no clear description of the competencies to be assessed. To make CBE programmes relevant, competencies need to be clearly spelt out and regularly reviewed to ensure that they match the changes in skills needed by employers.

Some teachers and students are used to teacher-centred approaches and this affects their attitude towards changes in the teaching and learning process. Teachers tend to teach the way they were trained, with less application of innovative methods (Murararaneza *et al*., 2016). CBE requires learner-centred methods of teaching such as project work and problem-based learning, and assessment of the competencies using rubrics. It is observed that most instructors have difficulty in developing and using rubrics to assess students' competencies (Reddy & Andrade, 2010). Instructor or teacher preparation requires commitment, readiness to change from traditional approaches to teaching and assessment and the devotion of time to course

development (Sullivan & Downey, 2015), which are difficult to achieve under the prevailing dispensation of content-based education.

Mitigating the Challenges of CBE in Higher Education Institutions

Higher education institutions are required to align the competencies of their courses to the established national or international qualification frameworks so that their graduates are internationally recognised for job placement. The competencies adopted should prioritise African needs and make them own the innovation. Employers should be engaged as members of curriculum advisory committees on what competencies to include in teaching and providing internship opportunities (Cheptoo, 2019).

Ewell (2013) observes that an integrated technology-enabled approach should be applied to match competencies with course materials, learning activities, measuring and reporting progress, and communicating the competencies to students and faculty members. Because of the intensity of CBE course design, delivery, assessment, recording and storing of all course-related competencies attained by the learner, Ewell advocates the integration of technology. The author, however, cautions that the validity of the evaluation rubrics and learning activities should be experimented with to ensure that they lead to demonstrable skills reflected in the competency frameworks. It is also important that faculty members are frequently engaged in analysing the assessed competencies to improve student learning outcomes and CBE programmes (Banta & Blaich, 2010; Kuh *et al*., 2014).

CBE requires a transition from the role of teachers as dispensers of knowledge to interactive teaching where learners actively participate in their own learning. Improved staffing to reduce the teacher-student ratio and professional development courses are needed to facilitate progressive teaching approaches (Desrochers & Staisloof, 2016). Both the public and the private sectors should invest in recruiting more teachers, professional training and integration of technology to address this challenge. Owing to the fact that some students have access to information from the net, HEI teachers need to be trained to use learner-centred methods of teaching and the integration of collaborative technological tools. A shift from providing delayed feedback to technology-automated grading is needed to help check their progress in achieving the required competencies. Thus the focus would be more on the learning process than the product, which is most clearly noted when summative assessment is used.

Successful implementation of CBE requires an intensive exercise of curriculum mapping to develop qualification frameworks or portfolios to select the right competencies required for a particular profession and to align course materials, teaching resources and methods, and assessment according to competencies (Ewell, 2013). Higher education institutions need to draft clear and detailed course competencies and relate them to established qualification frameworks to improve the job mobility of their graduates. It is on the basis of these competencies that different teachers will be guided to plan their teaching and ensure that CBE is implemented with fidelity.

The voices of the graduates, representatives of the academic community, professions, and the industry sector/employers should be listened to in identifying the competencies to be taught, how to assess them and how tertiary institutions will cooperate with the industry to provide hands-on experiences to the learners (Makulova *et al.*, 2015). Employer associations are needed to coordinate internships and placements of students to gain work experience. For example, Unit Five Education Association (UFEA) contacted all association members to secure internship placement for CBE diploma and certificate horticulture students (Mulder & Eppink, 2011). Equally, higher education institutions need to partner with and empower the industrial sector to allocate sufficient time to and undertake comprehensive assessment of internees during their practicums. Records of internees' and former students' performance from the employers should be fed to course creators and facilitators to inform them about what competencies need to be maintained or improved.

Overall, there is a need for attitude change, willingness to re-learn, and readiness to take on new roles by both instructors and learners so as to effectively implement CBE programmes. Initial training of teachers to use CBE teaching approaches should be conducted to reduce the fear of taking on the new roles. Teacher education/training institutions and colleges/faculties are the best suited to plant the seed of CBE in prospective teachers. Lecturers at universities and other tertiary institutions need to be provided with refresher courses and training to help them adopt interactive strategies for contextualising activity-based pedagogies in delivering courses to students. There is generally a dire need to shift from rote teaching and learning witnessed in the business model of content-based education to the preferred service model of competency-based education.

Conclusion

The need to adopt innovation in education, particularly a shift to competency-based education, has attracted great attention from developed countries but occasioned a slow response in sub-Saharan African universities (Kiguli, 2011). The current education produces graduates with skills that do not match those needed by society and employers, which calls for a need for higher education institutions to adopt CBE (Murararaneza *et al.*, 2016). CBE focuses on what learners know and can do to effectively perform a task rather than what they know or the duration of the course. Therefore, the disruption of the school calendar caused by COVID-19 needs an intervention that caters for individualised progression based on acquired competencies rather than waiting for the completion of the programme duration. The slow-down in adaptation to CBE may be attributed to challenges that include rigid regulation bodies, high student-teacher ratios, limited learning resources, and limited qualification frameworks to aid institutions in formulating course competencies.

As observed by Ford (2014), redesigning education programmes around competencies and qualification frameworks is the way to go, though it is a complex undertaking that requires institutional transparency, collaborative cultures, alignment of stakeholders' goals and interests around student-centred learning, effective integration of authentic assessment, and

other accountability reporting measures. Admittedly, the current content-based curriculum may not favour some privately sponsored students, particularly in the light of the financial constraints their parents are facing due to the pandemic. Some may drop out of programmes because their parents are unable to pay their tuition and they are unable to access jobs since they do not have the required credentials. This prompts the current researchers to advance the conversation on the need for higher education institutions to rethink developing CBE programmes where progression depends on the acquisition of competencies. Therefore, if higher education institutions are to adopt CBE, designing of the curriculum should take the bottom-up approach so that the designers will seek advice from learners, employers and parents rather than entirely depending on the curriculum experts. Therefore, it is time to embrace technology to facilitate CBE because this education innovation requires the intensive collection of data about learners' competencies to address individualised learning. This shift is envisaged to position education as a service rather than as a business with assessment servicing as a means for the school owners to exploit the poor.

Limitations of the Paper

Although the critical review of related literature has revealed that CBE has the potential to improve the quality of education, some of these studies had limitations. For example, Simonds *et al.*'s (2017) study was conducted in the USA with a small number of students. Thus the results obtained may prove different in universities with big student-lecturer ratios, particularly in some Ugandan universities. Further, Simonds *et al.*'s (2017) study was conducted in a developed country with greater expenditure on education and with the potential to determine internationally acceptable competencies.

The majority of these studies were conducted on a few programmes; none was a tracer study or focused on students' attitudes towards the CBE model. For instance, Kabanga *et al.*'s (2018) study was limited to CBE curriculum content while Mulder and Eppink's (2011) study was limited to the first cohort of newly designed programmes. This attests to the fact that CBE is not widely implemented in Africa and that the competencies demonstrated by the graduates are not meeting society's expectations and needs (WHO Regional Office for Africa, 2014). It is also observed that, although Oyugi (2015) states that CBE is becoming popular in higher education in Uganda, the author does not provide practical examples of CBE implementation in higher education. Generally, as noted by Ford (2014), there is still limited literature on institutions that have successfully adopted the CBE model in developing countries, particularly Africa. There are also limited qualification frameworks to guide institutions to select the competencies to include in the curricula.

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Graduate Students' Perceptions Regarding Blended Instruction Implementation at Kyambogo University, Uganda: Implications for University Management

George Wilson Kasule
Senior Lecturer, Department of Educational Planning and Management, Kyambogo University P.O. Box 1, Kyambogo, Kampala, Uganda
Email: gwkasule@kyu.ac.ug

Abstract

Background: Undeniably, universities across the globe, particularly in African countries like Uganda, more than ever before are faced with acute challenges, e.g. coping with the ever increasing number of people that desire university education as well as conducting their core activities, such as teaching in pandemic situations like COVID-19. Kyambogo University (KyU) has made an attempt to position herself to adequately handle a huge number of students as well as to teach effectively in a pandemic era, such as that of COVID-19. The University Senate resolved that all programmes be offered through blended instruction starting with the 2020/2021 academic year.

Problem: KyU management has not made a comprehensive effort to ensure that students are equipped with the necessary knowledge and skills for online learning as well as ensuring that the students have the gadgets and other

ICT accessories that make e-learning possible. There is no empirical data that gives insights regarding whether students have adequate knowledge and skills to use online learning platforms; the attitudes of students regarding online learning; adequate internet data; and reliable power/electricity which are basic considerations for e-teaching and e-learning to take place. Thus, this study set out to find out the views of graduate students regarding blended instruction implementation and the associated implications for KyU management.

Research questions: Do graduate students have adequate knowledge and skills to use online learning platforms? What is the attitude of graduate students to blended instruction? Do graduate students have adequate internet data for online learning? Do graduate students have reliable power/electricity for online learning? What do graduate students deem as vital for effective implementation of blended learning at KyU?

Methods: The study employed a cross-sectional survey. Twenty-one graduate students from the Faculty of Education at KyU were selected purposively. Data was collected through an open-ended questionnaire. The data was analysed through percentages and content analysis.

Results: The findings of the study indicate that the majority of the students (71.4%) have not been introduced to online teaching platforms; 81% do not have adequate knowledge and skills to use online learning platforms; 61.9% think that online teaching and learning at KyU is a good idea; 71.4% indicated that they cannot get adequate internet data that can enable them to be part of the online teaching and learning; and 61.9% stated that they do not have reliable power/electricity at their place of work/home that can enable them to effectively participate in online learning at KyU.

Conclusions: Blended instruction is an idea that is very much welcome by the graduate students. However, aspects of such instruction, e.g. internet connectivity, power availability, internet data availability, knowledge and skills to use ICT, and attitude of the lecturers and students, are some of the obstacles that hamper effective implementation of blended instruction at KyU.

Implications: An aggressive attitude change strategy for students and lecturers regarding the adoption of online teaching and learning is needed. Pragmatic measures to ensure that students and lecturers are trained and have adequate knowledge and skills in ICT, and have reliable internet, adequate internet data, reliable electricity/solar power, need to be undertaken.

Keywords: Graduate students' perception, 'blended instruction implementation, university management, implication.

Introduction

During any crisis situation like a pandemic, war or natural disaster, blended instruction could be used to meet the academic needs of learners in more effective and efficient ways than we could imagine (Bordoloi, Das & Das, 2021). In generic terms, blended instruction is an approach that alternates online learning for a portion of the traditional face-to-face instructional time (El-Zeftawy & Hassan, 2017). In the mind of Bowyer (2017), blended instruction is conceptualised as a mixture of online and face-to-face learning. It is vital to note that several authors have argued that the online element should not solely be an addition to classroom-based teaching; rather, blended instruction requires the effective integration of both virtual and face-to-face methods. For instance, Vandermolen (2010) attests that blended instruction is emerging as one of the most promising instructional practices in educational settings. The foregoing author avows that blended instruction combines two learning environments: traditional face-to-face instruction and online instruction. Recent work by Ustun (2018) advances that online courses are extensively being used in higher education with the rapid and exponentially expanding growth of online learning environments.

However, much as this could be true in Asia, Europe, USA and other developed countries across the globe, the situation in sub-Saharan African (SSA) countries like Uganda is quite different since adoption of online courses, especially in public universities, e.g. Kyambogo, is just at the infant stage. The effort towards implementation of blended instruction in public universities in Uganda is a right step in the right direction. Besides, the advantage of blended instruction was recognised by the Saudi Arabia Ministry of Higher Education as a solution to the challenge of providing college education to the rapidly growing student population (Alebaikan, 2010). This is buttressed by Shivam and Singh (2015), who espouse the view that bended instruction is a learning programme where more than one delivery mode is being used with the objective of optimising the learning outcome and the cost of programme delivery. Similarly, Alkhaaleel (2019) ascertains that blended learning is progressively becoming a viable option for higher education students as it permits the improvement of face-to-face between teachers and learners, using the internet or computer-based techniques. Accordingly, if public universities in Uganda want to become competitive in the ever-changing university education environment and significantly contribute to the desired socio-economic transformation of Uganda, effective adoption of blended instruction is paramount.

Literature Review

Vandermolen (2010) advances that it is critical that teachers are adequately prepared for the rigours of teaching that the different blended instruction setting requires. Besides, it is irrefutable that significant time and training are needed prior to the implementation of blended instruction. Vandermolen (2010) asserts that teachers need support after the initial training to reflect and deal with the different working conditions they face in the blended classroom setting. Bordoloi *et al.* (2021) conducted a study with a view to understanding the

perceptions of the teachers and learners regarding the use of online/blended learning modes in teaching-learning transactions.

A study by Ayob, Halim, Zulkifli, Zaid and Mokhtar (2020) provides an overview of blended instruction concepts that could be implemented in teaching and learning, e.g. the station rotation model. Meanwhile, Rojabi (2020) explored students' perceptions of online learning via Microsoft Teams involving 28 students at Open University (Universitas Terbuka-UPBJJ Jember). Rojabi's (2020) findings reveal that online learning via Microsoft Teams is categorised as something new for the students but this interaction and learning environment has the potential to motivate students to participate in online learning as students can easily comprehend the learning materials. Kosar (2016) carried out a descriptive study to reveal English as a Foreign Language (EFL) instructors' perceptions of blended learning at two state universities in Turkey. The findings indicate that the participants have positive perceptions of the blended learning approach although they put forth a number of challenges regarding its implementation.

Akkoyunlu and Soylu's (2008) study examined the students' learning styles and their views on blended learning and involved 34 students at Hacettepe University, Ankara, Turkey. The results revealed that students' views on the blended learning process, such as ease of use of the web environment, evaluation, the face-to-face environment etc., differ according to their learning styles. The results of Akkoyunlu and Soylu's (2008) study further reveal that the highest mean score corresponded with the face-to-face aspect of the process when students' evaluation concerning the implementation is taken into consideration. Sari's (2016) study describes students' perception of blended learning, the combination of face-to-face classroom and online class. Sari's (2016) findings reveal that blended learning is categorised as something new for the students but that makes teaching and learning easy.

Ali and Sofa's (2018) study duly explored Institut Agama Islam Negeri Pekalongan students' perceptions regarding the implementation of an approach that combines features of face-to-face instruction and online learning in their large English class. Relatedly, Surjono, Muhtadi and Wahyuningsih (2017), through a quasi-experiment, investigated the effects of blended and traditional learning in multimedia courses for undergraduate students in Indonesia. The findings indicate that students learning in blended mode achieved better scores than their counterparts. Correspondingly, Jackman's (2018) work provides a reflective account of the implementation of blended learning in terms of the principles and mechanics employed and what it meant for students and lecturers. The findings reveal that lecturers developed many creative approaches to facilitate online learning using various media. Medina's (2018) study provides invaluable insights into different levels of blending, i.e. the various perspectives within the educational community on its use, and a discussion of its future applicability, especially in higher education.

Wright (2017) advances that online teaching is more readily accepted as a viable component in teaching and learning, and blended learning, the combining of online and face-to-face

learning, is becoming commonplace in many higher education institutions. Blended instruction, particularly in developing countries, is in its early stages and is not without challenges. Wright's study investigated common student perceptions of the online lesson as compared to face-to-face lessons. Meanwhile, Sari and Wahyudin's (2019) study explored the students' perceptions regarding English language learning and the implementation of Instagram in their English for Business class. Sari and Wahyudin's (2019) study indicate that most students showed high positive perceptions of the use of Instagram in their learning since social network Instagram influenced their motivation, engagement and attitudes. Similarly, the work of Rasmitadila, Widyasari, Humaira, Tambunan, Rachmadtullah and Samsudin (2020) reports students' perceptions of the application of the blended learning approach in inclusive education courses.

El-Zeftawy and Hassan's (2017) study indicates that about 40% of students indicated their agreement with the good reputation of the blended course they were undertaking, loyalty to the course, and that its service and instruction were delivered as promised. Turner's (2018) work reports teachers' perceptions of the benefits of blended learning by grade span groupings – elementary, middle and high school teachers – and examines teachers' perceptions of their use of blended learning for instructional delivery and student production. Likewise, Osadebe and Osadebe (2020) indicate that there is high perception of students' use of ICT in teaching and learning at university.

Syauqi, Munadi and Triyono (2020) report that students feel that online learning has not provided a better experience and productivity in mastering competencies, but can provide motivation and ease in their learning. Syauqi *et al.* (2020) also indicate that some students stated that they had ease of access to resources, but students were still reluctant to use it sustainably in the future. El Khuluqo, Ghani and Fatayan (2021) show that most students who had undergone experience of the online learning activities encountered some obstacles because they had never conducted learning from home before. Berrio's (2017) study investigated students' perceptions of a blended learning environment at the language school of Universidad de La Guajira and provides insights for future institutional implementation in other undergraduate programmes.

Zuvic-Butorac, Roncevic, Nemcanin and Nebic (2011) conducted a study on students' perception and e-learning acceptance. Similarly, Manowong (2016) explored students' perceptions of the use of Edmodo as a supplementary tool in an EFL classroom. The findings reveal that Edmodo is perceived as a useful and beneficial learning tool to supplement traditional face-to-face classroom settings since it provides various features that support the students' learning process.

Baczek, Zaganczyk-Baczek, Szpringer, Jaroszynski and Wozakowska-Kaplon (2020) assert that the COVID-19 pandemic has disrupted teaching at a variety of institutions, especially in medical schools. Accordingly, electronic learning (e-learning) has become the core method of teaching the curriculum during the pandemic. The results of the study by Baczek *et al.* (2020) show that e-learning is a powerful tool for teaching medical students. However, in Baczek *et al.*'s (2020) view, successful integration of online learning into the curriculum requires a well-

thought-out strategy and a more active approach. Nurmasitah, Faridi, Astuti and Nurrohmah (2019) advance that with the rapid advancements in technology, the teaching and learning process can longer be limited by place and time. Correia (2016) employed a qualitative approach – the phenomenological design – and examined the perceptions of teachers and administrators with regard to their understanding of how the concept of blended learning is defined, as well as how it may affect student learning within the classroom.

The results of Alebaikan's (2010) study indicate that blended learning has the potential to offer a successful learning experience in Saudi Arabia. Beukes' (2018) study reports on how students perceived different blended learning elements (flipped classroom, an online simulation and cooperative learning initiatives) incorporated into the holistic blended learning model in an auditing module / course, to contribute to their learning and engagement with the subject matter. Ocak and Topal's (2015) study examined levels of satisfaction and perceptions of the students taking the blended anatomy course in the Turkish Higher Education System. The results indicate that medical students perceive the blended learning environment positively. Shaw (2010) conducted an exploratory research with a view to establishing students' perceptions of blended learning environments at Tarleton State University in Texas. Talis, Akib and Baso's (2018) study sought to establish students' perception regarding the implementation of the blended learning method in English Language Teaching (ELT) to fifth semester students at the English Department Makassar Muhammadiyah University. Talis *et al.* (2018) attest that when blended instruction is employed, students become more active and responsible for learning.

Gyamfi and Gyaase (2015) advance that increasing utilisation of ICT in addressing various societal needs has catalysed the need to deploy this all-important tool in education in developing countries to address the needs created by the increasing student enrolment in universities. The foregoing authors' study was conducted to assess students' perception of the blended learning environment. The findings show positive perceptions among student regarding the blended learning environment. However, slow internet connectivity and lack of internet access outside the university campus hindered the effectiveness of the blended learning environment for a few students. Improvement in ICT infrastructure and capacity building for lecturers to adopt the blended learning approach were recommended by Gyamfi and Gyaase's (2015) study. Kurt and Yıldırım (2018) conducted a study with the aim of to finding out the students' perceptions of blended learning through the Q method. The findings indicate that students were in agreement regarding blended learning and the prominent components of the process were listed as teaching staff, face-to-face classes, student roles and the features of online course materials. Relatedly, Sorbie's (2015) study explored teacher perceptions of blended learning. The findings show that teachers believe that blended instruction promotes individualisation, collaboration, organisation, engagement, real-world relevance and student-centred learning.

Balci's (2017) study provides strong evidence that students have both positive attitudes and negative attitudes towards blended learning. Shantakumari and Sajith's (2014) study concludes that students hold a positive perception of the blended learning courses being offered at Gulf Medical University. Irum, Bhatti, Abbasi and Dilshad (2020) explored the perceptions of students about the problems and challenges faced by Bachelor of Education the students in the universities of Pakistan. The findings of the study revealed that the majority of students had a very positive view of blended learning but, at the same time, they mentioned many problems they faced during the learning process, for example, lack of proper time, lack of skills and support to use ICTs the proper way, lack of training, and unavailability of Learning Management Software (LMS) to enable the use of technological items for learning purposes. Naaj, Nachouki and Ankit (2012) conducted a study in the College of Information Technology to evaluate the levels of student satisfaction with blended instruction. The findings indicate that student satisfaction is considered an important factor in measuring the quality of blended instruction.

Ying and Yang's (2016) study evaluated both academics' and learners' perceptions of blended learning at Swinburne University of Technology Sarawak, Malaysia so as to provide better understanding of factors and issues to be considered when adopting blended learning. Meanwhile, AlKhaleel (2019) investigated the advantages of using blended learning in teaching EFL at the English Language Center (Females Section) / the Medical Faculty, University of Tabuk for the academic year 2018/ 2019. Kryczka (2014) report that the growth in online student enrolments in higher education in the United States is transforming post-secondary education by making academic courses and degree programmes accessible to more students. Kryczka (2014) further affirmed that, on a disturbing note, many faculty do not accept the value and legitimacy of online education, and view it as inferior to traditional on-campus instruction. Kebualemang and Mogwe (2017) conducted an empirical investigation into the effects of blended learning on tertiary students and students' perceptions of the approach. The findings indicated that the blended learning mode has a positive impact on the students, and students' perceptions of the blended learning mode were also positive. Murphy (2019) states that blended learning is a type of instructional strategy which incorporates both online and face-to-face instruction. The findings of the foregoing author indicate that a relationship exists between teaching beliefs and teachers' intention to use blended learning instructional strategies in their high school classes.

Gagnon (2014) used a case study design to examine the impact of a blended instructional model on students in an Advanced Placement Macroeconomics course. Meantime, Huss and Eastep (2013) advance that there is little argument that online education, once considered a novelty or, at best, an alternative delivery method aimed primarily toward an idiosyncratic population of students, has moved aggressively into the mainstream of higher education. Correspondingly, Poon (2013) ascertains that blended learning, which is usually viewed as a combination of face-to-face and online delivery methods, can influence students' perceptions

of the learning environment and, subsequently, their study experiences, learning outcomes, and ultimate academic achievement. Jeffrey, Milne, Suddaby and Higgins (2012) explored student and staff attitudes to blended learning in New Zealand. The findings show that students have a strong liking for blended modes of learning. Saeed's (2020) study explored the perceptions of teachers regarding the use of blended learning. The results show that a positive campus culture and the availability of effective resources allow lecturers to use technology in meaningful ways.

Afzal, Ali and Gilani (2019) advance that there are several advantages of blended instruction to the faculty, students and institutions as well. In the foregoing authors' study, it is reported that about 65% of students showed a positive response towards the information quality of their course, usability of elective courses, satisfaction with the course and perceived as useful the elective practicum of the blended learning course at Lahore School of Nursing, University of Lahore, Pakistan. Muin and Amelia (2018) advance that one of the most current issues in recent years has been the development of integrating online learning in the classroom. Nwankwo (2015) examined the learning experiences and perceptions of students in online courses at a university in the western United States. The results showed that the participants rated interaction with course material as most important, followed by interaction with the instructor. Abramenka (2015) revealed that barriers students encounter when taking online courses. He recommends that email or text messaging should be used for nearly every type of collaboration. In addition, the instructor should be mindful of course layout and response time to student questions. Adas and Shmais' (2011) study concludes that, in general, the students' attitudes towards blended learning were positive.

The results of the study by Ghaderizefreh and Hoover (2018) indicated that: (1) students' reports of high understandability and illustration in the course were related to greater enjoyment and lower levels of anger, anxiety and boredom; (2) higher levels of course expectation, difficulty, fast pace, and lack of clarity were related to greater experiences of negative emotions such as anger, anxiety and boredom; (3) higher levels of understandability, illustration, enthusiasm, and fostering attention led to increased student satisfaction; and (4) higher levels of enjoyment and lower levels of anger and boredom increased students' satisfaction with the online learning experience. Su (2016) examined issues related to online graduate course effectiveness, and graduate student perceptions of characteristics of online learning environments and their effectiveness, and explored the relationship between graduate student perceptions and student success in online courses. Coman, Tiru, Mesesan-Schmitz, Stanciu and Bularca's (2020) research focused on identifying the way in which Romanian universities managed to provide knowledge during the coronavirus pandemic, when, in a very short time, universities had to adapt the educational process for exclusively online teaching and learning. Thus, they analysed students' perception regarding online learning, their capacity to assimilate information, and the use of e-learning platforms. The results of the research revealed that higher education institutions in Romania were not prepared for exclusive online

learning. Thus, the advantages of online learning identified in other studies seem to diminish in value, while disadvantages become more prominent. The hierarchy of problems that arise in online learning changes in the context of the crisis caused by the pandemic. Technical issues are the most important, followed by teachers' lack of technical skills and their teaching style improperly adapted to the online environment. However, the students assigned the lack of interaction with teachers or poor communication with them to the last place.

Larsen's (2012) findings indicate that the teachers needed a fairly minimal amount of pedagogical and technical training to employ blended learning successfully. McComas (2019) asserts that the combination of technology and teacher involvement to deliver high-quality instruction is important in 21st century learning. Jones (2019) affirms that blended instruction has transformed the landscape of classrooms over the past few years, as technology has become more readily accessible. Tongpoon-Patanasorn and White's (2020) study aimed to examine teachers' and students' perceptions of the design of blended learning in English language courses. The results reveal that what is needed is the professional training of teachers training in how to design blended learning courses beyond the course management system level and how to raise and maintain students' motivation for online learning.

Ughade and Badre (2020) advance that blended instruction is a suitable and effective method for better learning in higher education. Lord and Lomicka (2008) explored and analysed the incorporation of technological tools into blended learning in order to assist other teachers in the creation of collaborative cross-institutional situations. Varthis' (2016) findings indicate that blended instruction promotes active, in-depth and self-regulated learning. Wong (2014) advances that the move towards 'blended learning', consisting of a combination of online and face-to-face teaching, continues to gain pace in universities around the world. Wong (2014) further affirms that despite having three new online options readily available for students to access e-learning, there was strong support for face-to-face delivery methods by some students.

Literature gap

From the literature presented above, it becomes clear that there is no single empirical study examining graduate students' perceptions regarding blended instruction implementation and associated implications for university management in East African countries, e.g. Uganda. Nearly all studies that have been conducted to examine graduate students' perceptions regarding blended instruction implementation have been conducted in Asian, European and other developed countries like the USA. The few reported studies that have been conducted in Africa were done in South Africa, Nigeria and Ghana. It is worth noting that none of the study cover the East Africa region. Besides, the reported studies do not profile what university management ought to do so as to realise the effective implementation of blended instruction. Accordingly, the present paper is deemed critical as it sets out to provide an insight into graduate students' perceptions regarding blended instruction implementation and associated implications for University management.

Problem Statement

KyU management has not made a comprehensive effort to ensure that students are equipped with the necessary knowledge and skills for online learning as well as ensuring that the students have the needed gadgets and other ICT accessories that make e-learning possible. There is no empirical data providing insight regarding whether students have adequate knowledge and skills to use online learning platforms; attitudes of students to online learning; adequate internet data; and reliable power/electricity, which are basic considerations for blended instruction to take place, especially when it comes to online teaching and learning. Thus, this paper set out to make a significant contribution to the educational literature by profiling the views of graduate students regarding blended instruction implementation and the associated implications for university management.

Study Objective and Research Questions

The study set out to establish the views of graduate students on blended instruction implementation and the associated implications for university management. The research questions included: Do graduate students have adequate knowledge and skills to use online learning platforms? What is the attitude of graduate students on blended instruction? Do graduate students have adequate internet data for online learning? Do graduate students have reliable power/electricity for online learning? What do graduate students deem vital for the effective implementation of blended learning at KyU?

Methods

Research design

The study employed a cross-section survey design. This was deemed appropriate for the study because the design permits the researcher to obtain data from a given sample of the population as it stands at a given time of the investigation (Amin, 2005). The study is largely descriptive in nature so as to enable the development of in-depth insight regarding the phenomena under investigation (Aspers & Corte, 2019).

Population

The target population for the study is graduate students at KyU. However, due to costs and other constraints, the study participants were drawn from only one faculty, i.e. the Education Faculty, out of the existing seven faculties. The Faculty of Education at KyU has the biggest number of graduate students pursuing post-graduate diplomas, master's degrees and PhDs. Consequently, it was deemed that data from the Faculty of Education graduate students would be comparatively generalisable to other graduate students at KyU

Sampling

Twenty-one graduate students from the Faculty of Education at KyU were selected purposively. The distribution is as follows: PhD in Education (Educational Planning and Management Specialisation) = 02 (9.6%); Master of Education in Policy, Planning and Management = 15 (71.4%); and Postgraduate Diploma in Educational Management and Leadership = 04 (19.0%). Purposive sampling was used to select the aforementioned category of graduate students. This was premised on the fact that being educational management students, they are in a better position to give invaluable information regarding how effectively and efficiently blended instruction is being implemented at KyU. They were also believed to be in a position to provide vital information regarding what university management ought to do to address aspects that hamper the effective and efficient implementation of blended instruction.

Data collection method and instrument

The study employed the survey method through the use of a self-administered open-ended questionnaire. The questionnaire was open-ended so as to make it possible for the respondents to yield rich information regarding the phenomena under investigation.

Quality of the instrument

In order to ensure that the instrument used in the study is valid and reliable, an effort was made to develop the instrument basing on the existing credible several empirical studies, e.g. bu Afzal *et al*. (2019), Ali and Sofa (2018), Beukes (2018), Bordoloi *et al.* (2021), and Ghaderizefreh and Hoover (2018), whose validity and reliability are indisputable.

Data analysis

The data was analysed through content analysis and the use of percentages in order to respond to the study research objectives and questions.

Ethical considerations

The researcher kept the participants' information confidential and used it purely for academic purposes. Additionally, the researchers clearly acknowledged and cited all the sources of information that were used. The participants were given the freedom to change and/or even withdraw their responses during the study.

Limitation

The study was limited to the views and experiences of only 21 graduate students at the Faculty of Education, KyU. Consequently, further studies employing a quantitative approach regarding the implementation of blended instruction and implications for university management could be carried out on a larger sample involving all graduate students at KyU. This would enhance the possibilities for generalising the findings.

Results

Biographical findings

The study involved 15 males, representing 71.4%, and 06 females, representing 28.6%. The findings correspond with those of several studies which indicate that males dominate graduate degree courses, especially PhD and master's degree programmes. Regarding the age of the respondents, the findings show that 05 graduate students (23.8%) were below 30 years; meanwhile, 06 graduate students (28.6%) were between 31-40 years. On the other hand, 07 graduate students (33.3%) were between 41-50 years. Finally, 03 graduate students (14.3%) were 51 and above years old. The findings tend to suggest that the majority of graduate students at KyU are above 30 years. This implies that the graduate students have numerous social and financial obligations.

Implementation of blended instruction at Kyambogo University

Have graduate students been introduced to online teaching platforms at KyU? The findings indicate that only 06 (28.6%) of the graduate students stated that they had been introduced to the online teaching platforms that lecturers use at KyU. The graduate students named Google Classroom, Zoom and email as some of the online teaching platforms they use during blended instruction. However, the majority of the graduate students, i.e.15 (71.4%), stated that they had not been introduced to the online teaching platforms that lecturers use at KyU.

Do graduate students have adequate knowledge and skills to use the online learning platforms available at KyU? The findings indicate that only 04 (19%) of the graduate students stated that they had adequate knowledge and skills to use the online learning platforms available at KyU. On the other hand, the majority of the graduate students, i.e. 17 (81%), asserted that they did not have adequate knowledge and skills to use the online learning platforms available at KyU. As a mitigation measure, the majority of the graduate students, i.e.12 (57.14%), affirmed that there was need to provide adequate training in how to use the online learning platforms available at KyU to teach graduate students, e.g. Google Classroom and Zoom, among others.

Is online teaching and learning a good idea at KyU? The findings indicate that a big number of graduate students, i.e. 13 (61.9%), stated that online teaching and learning at KyU is a good idea. Some of the reasons given by the graduate students include: online teaching and learning is an appropriate mode of education service delivery in times of pandemics like COVID-19; it is convenient; it saves time; it is less costly in terms of movement; it involves less financial cost; no transport cost is incurred as people study from their home/workplace; a variety of instructional materials can be easily accessed, e.g. through an e-library; no cost incurred for printing hard copies; there is no problem of congestion in class and the library; storage of bulky stationery is minimised; it is appropriate for working class students; it impels lecturers to use modern ways of content delivery rather than using obsolete methods, e.g. dictating notes to students during the face-to-face sessions; lecturers who are always caught

up in academic meetings and other university assignments can record lectures and let students access them in due time; and in case a student missed a lecture for one reason or another, a lecture, e.g. via Zoom, could be recorded so that the student who missed can still access the recorded lecture.

Meanwhile, a small number of the graduate students, i.e. 08 (38.1%), stated that online teaching and learning at KyU is not a good idea. Some of the reasons given by the graduate students who subscribe to this view include: in remote areas, power is not available and where it is, at times is unreliable; lack of internet connectivity; a weak/slow internet or internet interruptions; not every student at KyU has both a laptop and a smartphone; not every student at KyU has adequate ICT skills; not every student has adequate data/MBs to use for online learning; some students can easily dodge lectures, giving fake reasons relating to there having been a technical challenge yet it would not be true; some students could put internet data to personal use instead of using it for academic purposes; students do not have adequate opportunity to discuss and exchange ideas as it is in face-to-face interaction; and some subjects, which are practical in nature, need hands-on training, thus face-to-face teaching and learning is better.

Do graduate students at KyU have adequate internet data that can enable them to participate in online learning? The findings show that a very small number of the graduate students, i.e. 06 (28.6%), stated that they had adequate internet data that can enable them to participate in online learning. The majority of the graduate students, i.e. 15 (71.4%), stated that they did not have adequate internet data that could enable them to participate in online learning. Some of the prominent reasons given by the graduate students include: inadequate funds to buy data; and weak and/or no internet connection for all KyU graduate students.

Do graduate students at KyU have reliable power/electricity that can enable them to participate in online learning? The findings show that a very small number of the graduate students, i.e. 08 (38.1%), asserted that they had reliable power/electricity that can enable them to participate in online learning. The majority of the graduate students, i.e. 13 (61.9%), stated that they did not have reliable power/electricity that could enable them to participate in online learning. Some of the reasons given by the graduate students include: some of them live in remote areas where there is no power and/or at times power is unreliable; they are unable to regularly pay electricity bills, thus, at times, power is disconnected; in some places there is a lot of load shedding, which interrupts the flow of current both at home and the place of work; and some graduate students live in rural areas where they use solar power but it is not strong and durable.

Implications for university management

What ought KyU management to do in order to effectively implement blended instruction? The findings indicate that the majority of the participants agree that KyU management should consider the following if blended instruction is to be effectively implemented: (1) Enter into partnership with internet service providers in the country so that affordable internet data is

made available to the graduate students and lecturers. This would ensure that no graduate student or lecturer uses the excuse of lacking internet data for use during online teaching and learning. (2) Ensure that the teaching timetable is based on the graduate students' consensus. (3) Enter into partnership with smartphone and/or laptop manufacturers/providers so that all graduate students and lecturers are provided with a smartphone and/or a laptop with fast internet applications at an affordable price on a hire purchase basis. (4) Ensure comprehensive training in how to use online teaching and learning platforms by all graduate students and lecturers. (5) Put in place an aggressive mindset change strategy geared at cultivating a positive attitude among all graduate students and lecturers towards the use of online teaching and learning platforms. (6) Finally, enter into partnership with electricity/solar power service providers in the country so that affordable and reliable electricity/solar power is delivered to all the graduate students and lecturers.

Discussion

The study findings agree with numerous empirical studies in terms of the importance of blended instruction and what is needed for its effective implementation in Ugandan public universities, e.g. KyU. This study corroborates Bordoloi *et al*.'s (2021) view that blended instruction is a panacea for providing higher education in the 21st century and beyond in challenging situations like pandemics and the ever-increasing demand for university education. The study finding corresponds with Vandermolen's (2010) that it is critical that lecturers are adequately prepared for the rigours of teaching that the different blended instruction setting requires. Furthermore, the results coincide with those of Kosar (2016) which indicate that a huge number of students have positive perceptions of the blended learning approach although they put forth a number of challenges regarding its implementation. The study findings agree with Wright's (2017) that combining online and face-to-face learning is becoming commonplace in many higher education institutions. The study findings are in agreement with Syauqi *et al*.'s (2020) that some students have ease of access to online resources but are still reluctant to use it sustainably.

Additionally, the study results agree with Baczek *et al.*'s (2020) that e-learning has become the core method of teaching the curriculum during the COVID-19 pandemic in contemporary educational institutions. This study supports Baczek et al.' view (2020) that successful integration of online learning into the curriculum requires a well-thought-out strategy and a more active approach. The study result agrees with Balci's (2017) that students have some positive attitudes as well as negative ones towards blended instruction. Similarly, the study findings are line with Saeed's (2020) which indicate that a positive campus culture and effective resources allow graduate students and lecturers to use technology in meaningful ways. The study findings concur with Ughade and Badre's (2020) that blended learning is a suitable and effective method for delivering better learning in higher education. The study findings further corroborate Varthis' (2016) that blended instruction promotes active, in-depth and self-regulated learning and, as such, should be embraced by public universities such as

Kyambogo. In addition, Wong (2014) asserts that the move towards blended learning, consisting of a combination of online and face-to-face teaching, continues to gain pace in universities around the world.

Conclusion

Blended instruction is an idea that is very much welcome by the graduate students at KyU. However, aspects of the instruction model, e.g. internet connectivity, power availability, internet data availability, knowledge and skills to use ICT, and attitude of lecturers and students are some of the obstacles that hamper the effective implementation of blended instruction at KyU. Subsequently, an aggressive attitude change strategy for students and lecturers regarding the adoption of online teaching and learning is needed. Additionally, pragmatic measures to ensure that students and lecturers are trained and have adequate knowledge and skills in ICT, have reliable internet, adequate internet data, and reliable electricity/solar power need to be undertaken.

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Effects of Government and Private Sector Financing on Higher Education Enrolment in Uganda (1970–2014)

Jimmy Alani
Department of Economics and Business Education
Faculty of Education and Humanities
Gulu University, P.O. Box 166, Gulu, UGANDA
Tel: +256 772 184 339, E–mail: j.alani@gu.ac.ug

Abstract

Background: The paper examines the effects of government and private sector financing on higher education enrolment in Uganda during the period 1970 to 2014. In the paper, data is analysed by use of the generalised least squares (GLS) method. Annual secondary data for the analyses was obtained from (a) the United Nations, consisting of household consumption, investment spending, government spending, and exports; and (b) UNESCO, consisting of observations on higher education enrolment. Government financing is estimated by annual levels of government spending and private sector financing is estimated by levels of household disposable income.

Empirical results obtained reveal that: (a) 1% increase in private financing (household disposable income spending) growth could have caused higher education enrolment growth to increase by 0.84% per annum on average

during the 1970 to 2014 period, ceteris paribus; (b) 1% increase in government financing (i.e. government spending) growth could have led to 0.33% annual increase in higher education enrolment growth during the given period, ceteris paribus; and (c) 1% increase in private consumption financing (household consumption) growth could have caused higher education enrolment growth to increase by 0.68% per annum on average during the 1970 to 2014 period, ceteris paribus. More empirical results reveal that (i) 1% increase in investment financing (investment spending) growth could have led to 0.17% annual increase in higher education enrolment growth during the given period; and (ii) 1% increase in tax financing (household income tax spending) growth could have caused higher education enrolment growth to rise by 0.34% per annum during the 1970 to 2014 period, ceteris paribus. The paper recommends enhancement of higher education enrolment through increasing the financing of the private sector, government, household consumption, investment, and export sector, as well as broadening the tax base, aggregate output and higher education student loans at the level of household disposable income.

Keywords: Government financing, private sector financing, higher education enrolment, attraction of students, retention of students.

Introduction

The purpose of this paper is to examine the effects of both private and government financing on higher education enrolment in Uganda during the 1970 to 2014 period. Massification of higher (tertiary) education is increased enrolment in higher education (Moremi, 2018). The development of higher education can be divided into three stages according to the level of gross enrolment (Gao, 2018). In the elite stage, the gross enrolment ratio is below 15%. In the massification stage, the gross enrolment ratio is from 15 to 50%. Meanwhile, in the universal stage, the gross enrolment ratio is above 50%. Throughout much of the world, for four decades, higher education has been in the massification stage (Hawkins, J. N., Mok, K. H., & Neubauer, D., 2018), according to the specific country and its unique circumstances (Gao, 2018).

Generally, the worldwide massification of higher education is commonly divided into two modes: (a) active and (b) passive and catch-up mode. The active mode exists in developed countries, such as the United States and Japan where massification of higher education is normally due to economic growth. The passive catch-up modes are found in some developing countries, such as China and Uganda, where massification of higher education is being driven as a leap forward by the government. The active mode in developed countries is mainly financed by government, whereas the passive and catch-up mode is mainly dependent on private sector financing (tuition fees and private donations). The active mode is characterised by a diversified higher education system. Meanwhile, the passive and catch-up mode is an extension of the elite stage (Gao, 2018).

Higher education in Uganda is in the passive and catch-up (development process) mode and it is in the massification stage because the country's gross enrolment ratio (GER) is at 6.8%. Meanwhile, massification of higher education in Uganda has led to a rapid increase in student enrolment, the number of universities, and the size of universities through private sector and public sector financing. As a result, in Uganda, massification of higher education has provided students with more opportunities for higher education. Massification of higher education in the country is meant to have higher education become accessible to all. It is important for economic and social development (Matovu, 2018). In Uganda, massification of higher education has been financed mostly by the private sector, and by households, which sponsor children and relatives from the respective households for education at universities and other tertiary institutions. Thus, massification has been driven by increased enrolments (NCHE, 2012).

In Uganda, the higher education institutions are terribly underfunded. Studies show that contributions of government to public universities have averaged only 0.3% as a percentage of GDP, compared to 0.9% as a percentage of GDP in Kenya, and 1.0% as a percentage of GDP in Tanzania within the same period (*The New Vision*, 2011). At most universities in Uganda, students pay about 30 to 40% of the unit cost of the programmes for which they are registered. It is a common belief that university education in Uganda is in a precarious situation due to issues of poor quality of education and the range of programmes offered, all arising from insufficient funding. Shortened school practice and congested lecture rooms are just a few of the many problems facing universities in Uganda (*The New Vision*, 2011).

Universities are facing more problems, such as payment of low salaries to lecturers, failure to expand, ignoring staff development, little funding for government institutions, decreasing government budget allocations, deteriorating infrastructure, decreasing ability to purchase inputs, and increasing student numbers. This renders universities unlikely to yield sustainable quality higher education in the future. Other problems facing universities in Uganda are financial crises, leading to mismanagement and brain drain (Omona, 2012).

In Uganda, the total number of higher education institutions more than doubled from around 95 in 2000 to 197 in 2012. The number of universities grew from 12 in 2001 to 34 in 2012. The number of other tertiary institutions grew from 155 in 2004 to 187 in 2012. The percentage of tertiary students studying science and technology courses grew from 15% in 2000 to about 32% of the student population in 2012. The tertiary gross enrolment rate (TGER) increased from 3% in 2002 to about 6% in 2012; and the TGER in Uganda was very close to the average TGER prevailing in sub–Saharan Africa within the given period (Kasozi, 2016).

The average annual funding of public universities in Uganda has been only 0.35% of the GDP in the last two decades. The above evidence Uganda is unlikely to attain the high-level critical skilled labour force required for the achievement of its development goals. The neglect of universities by African governments has led to a reduction in the production of home-grown knowledge and that of local skilled human resources, thus leading to the over-employment

of foreign experts (Kasozi, 2016). Meanwhile, in Uganda, public recurrent contribution per higher education student declined from US$2,532 in 1970 to US$1,113 in 1988, then to US$635 in 1995. The average higher education share of the Ministry of Education budget was about 10 to 12% in the last two decades due to budgetary constraints (Kasozi, 2016).

Higher Education Financing, Enrolment and Massification in China

From the 1980s onwards, China undertook dramatic higher education expansion. As a result, higher education in China has moved from catering for the elite to a state of massification. This has been accompanied by increasing privatised and market-oriented strategies to create opportunities to cope with the pressing demands for higher education (Mok, 2016). To attain the massification of education, China has made drastic attempts to expand higher education enrolment in the last two decades, thus making enrolment of students at higher education institutions increase from 0.67 million in 1988 to 1.08 million in 1998, and then to grow from 1.6 million in 1999 to 6.98 million in 2012. Meanwhile, the gross enrolment rate in higher education increased from 5.8% in 1999 to 8.7% in 1999, and then accelerated to 35.7% in 2012 (Mok & Jiang, 2017) .

China very rapidly emerged as one of the world's most important countries in international education. For two decades, commencing from 1989, the number of Chinese students enrolled in degree programmes abroad increased by 590% up to more than 900,000 in 2017, making China the largest sending country of international students worldwide by far. China, with a population of 1.4 billion people, has had unrivalled impact on global higher education. The large number of Chinese students on university campuses in Western countries is now a common phenomenon(WENR, 2019).

India is the second largest sending country of international students. There are three times more Chinese students enrolled internationally than students from India. In countries such as the United States, Canada and the United Kingdom, universities and local economies have benefited from expenditures and tuition fees paid by these students, and their financing has become an important economic factor. These students generate onshore revenues close to US$7 billion, thus making international education in Australia the largest service export (WENR, 2019).

The education system in China has simultaneously undergone unprecedented expansion and modernisation. China's higher education is now the world's largest education system after the number of tertiary education students increased six-fold from just 7.4 million in 2000 to nearly 45 million in 2018. Meanwhile, the country's tertiary gross enrolment rate (GER) jumped from 7.6% 2000 to 50% in 2018 compared to a current GER average of 75% in high income countries. Therefore, China has now achieved universal participation in higher education.

Moreover, by 2018, China was training more PhD students than the US and the number of scientific. technical and medical research papers published by Chinese researchers exceeded, for the first time, those produced by US scholars (WENR, 2019).

China now spends more on research and development than all the European Union countries combined. Soon, China is expected to overtake the US as well, in research expenditures. Chinese higher education institutions (HEIs) currently pass out about 8 million graduates annually, thus graduating more students than the combined number of graduates the US and India produce. In China, massification of higher education has been accompanied by exponential growth in the number of higher education institutions. In 2019, China had 514,000 educational institutions and 270 million students enrolled at all levels of education. Furthermore, China's top universities now provide increasingly high-quality education. Quality improvements and other factors at Chinese universities have made China itself become an important destination country for students from Asia, Africa and elsewhere (WENR, 2019).

China has more than 2,956 HEIs and they are composed of degree-granting universities and research institutions, junior colleges, vocational colleges and universities, and adult education institutions. But not all these institutions have degree-granting authority. Some institutions only award non-degree qualifications. Meanwhile, others that are affiliated to "mother universities" confer the final degrees. Degree-granting authority is mainly limited to universities and research institutions. But there are also 257 independent colleges that can award degrees. These institutions are private colleges affiliated to public universities. They have more autonomy than other colleges in matters such as admissions requirements. However, they do not receive government funding and charge much higher tuition fees, while having lower admission standards. As a result, programmes offered by these institutions are usually professionally oriented programmes. They are offered in the fields of computer science or business, an increasing popular option in China (WENR, 2019).

In China, private providers are solutions for addressing the mass demand for higher education. From 2001 to 2016, the number of private HEIs jumped from 39 to 786. As a result, private institutions now make up some 27% of all the HIEs in China, enrolling 6 million students in 2016. Private institutions generally offer more applied employment-focused programmes. There are more than 300 private vocational colleges. Some of them rent building and other infrastructure from public institutions (WENR, 2019).

While top HEIs are fully funded with vast resources, other HIEs are underfunded and of lower quality. China's best and most generously funded universities are located in Beijing and Shanghai. They are great cities of eastern China and all of them are public institutions directly overseen mostly by the Ministry of Education in Beijing or other central government bodies. They are generally large multi-faculty research institutions benefiting from public funding. As a result, the tuition fees charged by these institutions are relatively modest compared to the fees charged by the private institutions (WENR, 2019).

Higher Education Financing, Enrolment and Massification in India

The Indian higher education system is one of the largest in the world. According to Sharma (2019), it is composed of some 51,649 colleges and universities. Indian higher education enrolment and institutions have increased almost four-fold since 2001. In 2019, China enrolled

41.8 million, while India enrolled 35.7 million students in universities and colleges (Ravi, S., Gupta, N., & Nagaraj, P., 2019). Therefore, in terms of enrolment, India is only second to China.

In the 1980s, a policy shift occurred in India, following the entry of the private sector into the higher education system. As a result, India has experienced massive expansion in the higher education sector. Thus, from 1990 onwards, the increment was mainly driven by the privately owned institutions. However, the private sector has not adequately expanded postgraduate education (UWN, 2019). The rapid increase in higher education had continued in the previous five years, with 6,000 institutions and six million students being added to the higher education system from 2012 to 2016–17. In 2019, India had a higher education gross enrolment rate (GER) of 26.3%. This rate was lower than the global average of 36.7%, but higher than the prevailing rate in other middle-income countries, with an average GER of 23.5% (UWN, 2019).

Meanwhile, after independence, the focus of the Indian government was on the establishment of higher education institutions instead of increasing access to higher education. For example, the Radhakrishnan-led University Education Commission of 1949 decided to limit the number of students in universities to 3,000 and colleges to 1,500 (Mathew, 2016). For instance, limiting the number of students in universities in India caused the GER to be 4.2% in 1971–1972 despite the establishment of 2,699 new colleges and 75 universities during the 1950 –1970 period (Varghes, 2015). From 2001 to 2016, there were 26.9 million students added to India's higher education system. Although both India and China had similar GER between 1996 and 2001, China almost doubled its enrolment rate from 9.76% to 20% (UNESCO, 2016).

After independence, the Government of India progressively funded most, if not all, of the higher education institutions until the 1980s. For instance, in 1979–1980, government funding accounted for 79% of all the expenditure on higher education in India. In the 1980s and 1990s, there was a dramatic increase in demand for education in India. As a result, unlike in the past, the demand for higher education could not be sustained solely through increasing government expenditure (Carnoy, Froumin, Loyalka, & Tilak, 2014).

For over 30 years (from 1980–1981 to 2010 – 2011), real government expenditure on higher education spending increased five-fold. Meanwhile, enrolment in higher education increased ten-fold during this period. In other words, during the 1980–2011 period, government expenditure increased at a rate of 10.9% per year, while enrolment increased at 21.25% per annum. Thus, the gap in enrolments and government spending was filled by the private sector (Carnoy et al., 2014).

Government or government-aided HEIs receive government funding. However, most private HEIs do not receive government funding and are almost totally reliant on student fees. The implication of this is that private HEIs prefer to run courses that are profitable and charge fees much higher than government HEIs. As a result, the expansion in higher education in the last two decades was funded out of household disposable income (Varghes, 2015). A more reliable indicator of the shift in higher education funding is the issue of student loans.

Student loans have exceeded government expenditures on higher education since 2007 – 2008 (Carnoy et al., 2014; Rani, 2016).

If the student loans issue were left to the market alone, there would be efficiency loss because the talented but credit-constrained students from poor family backgrounds would be unable to access education and this would result in distributional inequalities. Therefore, the role of government in higher education financing is justified. Government financing of higher education is in line with one of the objectives of the education policy in India, namely to provide equity of educational opportunities and student loans programme in India (Varghes, 2015). Moreover, children from well-off families exit publicly provided low-quality school education and migrate to the freely provided or highly subsidised high-cost and high-quality public higher education (Rani, 2014).

An education loan scheme in India was first launched in 2001. To date, the scheme is administered and scheduled by commercial banks. It covers a wide range of courses in higher education studies in India and abroad.

Any Indian student who secures admission to a domestic and foreign educational institution is eligible to apply. To be considered for this loan scheme, there is no income ceiling on students and parents for the eligibility. The loan amount covers both instructional costs and living expenses. Interest rates vary depending on the loan slabs and the loans can be serviced in five to seven years. Meanwhile, repayment could begin one year after completion of the course or six months after getting employment (Rani, 2016).

Interest is charged during the period of study until the completion of the course. From the beginning of scheme up to 2001–2002, education loans amounted to 0.11 million and rose to 2.59 million in 2013/2014. The approval rate for the loan scheme has always been above 95% (Rani, 2016). The average annual growth rate of loan accounts was 28.7%, while growth in education was about 12%. The amount of the loan scheme increased rapidly at a phenomenal annual growth rate of 38%. Meanwhile, the growth of government expenditure was estimated at 15%. The share of education loans was about 8.8% of total expenditure on higher education in 2001 and it increased to 85% in 2006–07. From 2007 – 2008 onwards, education loans exceeded government expenditure on both higher and technical education (Rani, 2016).

In India, since 2019, government spending on higher education has been accounting for a smaller proportion of higher education expenditure as privately owned higher education institutions outnumbered government ones. In the country, privately owned institutions make up 77.8% of all higher education institutions and account for 67.3% of all enrolments (Ravi et al., 2019).

Higher Education Financing, Enrolment and Massification in Sub-Sahara Africa

Since independence in the early 1960s, for many African countries, higher education has expanded dramatically. Meanwhile, emphasis has been put on human resource formation to develop and modernise various sectors of African economies. Higher education in Sub-Saharan Africa (SSA) was viewed as a tool for development and for producing more graduates to create

a critical mass of skills and experts for economic growth and development (Teferra, 2013). The reason for considerable investment in education across different countries in SSA has been the fact that higher education would continue to contribute to economic growth and development as well as generate personal, economic and non-economic benefits (Amin & Ntembe, 2021).

Higher education generates employment capacity through human capital formation (Teferra, 2013). Acquiring sustainable growth in SSA requires that the individual economies in the region develop workforce skills that can harness scarce resources greater economic productivity. Thus, investing in higher education is a strategy for providing individuals with skills and knowledge to sustain economic transformation (Amin & Ntembe, 2021). In Africa, higher education average returns to investment is 21% and it is the world's highest (Ilie & Rose, 2016). Evidence from some studies reveals that raising higher education by about 0.39% could generate about a 12% rise in GDP (Valero & van Reenen, 2019).

But higher education in SSA is underfunded despite the enrolment growth that surpasses the financing capacities (Amin & Ntembe, 2021). The decline in the dominance of government financing is a common phenomenon in higher education funding. This demonstrates how this financial source is unattainable in the medium to long term (Teferra, 2013). Moreover, sources of higher education financing in SSA are few and limited. The sources include the following: (i) government or public financing; (ii) parents or family and households; (iii) students themselves; (iv) individual and institutional donors; and (v) income-generating activities of the academic institutions. Altogether, these sources tend to generate a limited amount of funds to SSA countries (Johnstone, 2016; Oketch, 2016; Teferra, 2013; World Bank, 2016).

Government funding in most counties is overstretched and inadequate to finance the surge in demand for access to higher education in SSA countries. Therefore, the prevailing amount of spending in higher education is inadequate to provide the desired level of quality in institutions that provide graduates with the required skills to find jobs and thrive in the labour market (Darvas, Gao, Shen, & Bawany, 2017; Johnstone, 2016). Shortage of funding is endemic in SSA. Thus, countries in the region need to undertake financial management reforms that focus on the diversification of funding sources that are sustainable (Teferra, 2013). Among other things, growth in higher education enrolment depends on (a) demographic factors and (b) the high growth rate in secondary and primary education systems, which are the key inputs in the higher education system (Darvas et al., 2017; Mingat & Majgaard, 2012). In SSA, enrolment considerations are essential because the youthful population in the region amounts to 1.1 billion and about 70% of the population are below 30 years old (Population Pyramid Net, 2019).

Furthermore, a rise in the public demand for higher education tends to be associated with factors such as income and economic growth, an increase in global competitiveness, progress in healthy and stable political institutions, an upsurge in private demand as an opportunity to acquire good jobs, and improvement in social justice (Oketch et al., 2014). The share of total education expenditures for SSA was 19.7% in 2010. Then it declined to 18.4% in

2012, before rising to 23.2% in 2018. The GDP per capita at 2010 constant US$ rose from $1,589 in 2010 to $1,705 in 2014, before declining to $1,675 in 2018 (Amin & Ntembe, 2021).

In SSA, there is growing demand for and supply of higher education as well as inequality in access, depending on the income group. SSA experienced the fastest growth in the enrolment rate during the 1970–2013 period. However, the higher education enrolment rate in SSA remained at around 4.0% and was the lowest in the world (World Bank, 2017) compared to the world average of 28% and developed country's average of 74%. One of the reasons for this is that the SSA region started from a low base. In 1970, SSA had fewer than 400,000 students. Thereafter, the number of students grew to 4.5 million in 2013, 7.3 million in 2013 and 8.8 million in 2016 (UNESCO, 2018; World Bank, 2017).

Higher education enrolment levels are low in SSA countries. Countries are categorised as "high-income" if their GDP per capita is more than US$2,000. High-income countries have high enrolment rates in higher education, estimated at 28%. Meanwhile, low-income countries have low enrolment rates in higher education, with SSA having less than 6%. Since 2000, there has been remarkable economic growth, although the enrolment rate in SSA has been low (Amin & Ntembe, 2021).

Owing to limited resources and high enrolment rates, high enrolment growth poses challenges in terms of high student-lecturer ratio and overcrowding in lecture halls, with an additional 50% more students per lecturer than before (Ilie & Rose, 2016; UNESCO, 2018). During the 1990s, the World Bank de-emphasised lending for higher education. As a result, the World Bank cut down on higher education lending while prioritising primary education. Other donors reasoned and acted in accordance with the World Bank notions (Amin & Ntembe, 2021).

However, in its 2019 report, the World Bank reversed its stand and started emphasising financing higher education in Africa as a primary solution for transforming lives by expanding employment prospects in SSA. Although government challenges in higher education financing are universal, in SSA, the extent and implications are critically different.

The factors that contribute to this difference are as follows: (a) the financial base is thin and weak; (b) a sharp growth in demand; (c) decreasing public spending per student; (d) limited coverage of primary schools because it is not yet universal although it is top on the priority list; and (e) households and families are not yet spending a large amount of money on primary school education (Oketch, 2016; Teferra, 2013).

In 2009, SSA had a total of 200 public universities and 468 private higher education institutions compared to 1,700 public universities and 2,500 private universities in the United States alone in the same period (Ilie & Rose, 2016). Universities in SSA suffer from reductions in public funding and need to strengthen collaboration with the private sector, especially in infrastructural development, such as academic facilities, faculty, and student housing (The Christie Company, 2018). Therefore, a reduction in public funding generates limited resources, leading to a high student-teacher ratio and overcrowded lecture halls having additional 50% more students per lecturer than before (Amin & Ntembe, 2021).

Among other things, the enrolment growth has implications for the quality of education in the developing world (Ilie & Rose, 2016; UNESCO, 2018). As a result, in 2010, over 74% of those eligible to do so in North Africa and Western Europe enrolled in higher education, while in SSA, 6% did so. Some scholars have argued that there is a critical threshold to be reached for tertiary education to have a substantial effect on macro outcome (Amin & Ntembe, 2021; UNESCO, 2018).

Generalised Least Squares Method

In this paper, the generalised least squares method is used to provide a more general variance covariance matrix for the disturbances. That is $u\sim(0,\sigma^2 I_n)$ is relaxed so that $u\sim(0,\sigma^2\Omega)$ where is a positive definite matrix of dimension $(n\times n)$. To derive the BLUE for β the Ω is assumed to be known. In the estimation of β, the GLS estimator $\hat{\beta}_{GLS}$ turns out to be different from the OLS estimator $\hat{\beta}_{GLS}$. Under the non-spherical form of the disturbances, the OLS estimates are still unbiased and consistent. But their standard errors are biased and inconsistent and leading to misleading inference. For every positive definite matrix Ω, there exists a non-singular matrix P such that, $PP'=\Omega$. In order to make use of the GLS method, the original model is transformed to

$$y=X\beta+u \quad (1)$$

Pre–multiplying equation (1) by P' provides $P^{-1}y=P^{-1}X\beta+P^{-1}u$. (2)

Defining $P^{-1}y$ as y^*, $P^{-1}X$ as x^*, and $P^{-1}u$ as u^*, yields $y^*=x^*\beta+u^*$. (3)

Where u^* has 0 mean and $Var(u^*)=P^{-1}Var(u)P^{-1\prime}$. (4)

$\therefore Var(u^*)=\sigma^2 P^{-1}\Omega P^{-1\prime}=\sigma^2 P^{-1}PP'P^{-1\prime}=\sigma^2 I_n$. (5)

Hence, the variance of the estimator $\hat{\beta}_{GLS}$ becomes $Var(\hat{\beta}_{GLS})=\sigma^2(X^{*\prime}X^*)^{-1}=\sigma^2(X'\Omega X)^{-1}$ (6)

(Baltagi, 2011, pp. 223–224).

Annual data used in data analyses were collected from the World Bank, United Nations and UNESCO on the following variables: household consumption (Cn), investment spending (I), government spending (G), exports (X) and higher education gross tertiary enrolment ratio(GER=H) for Uganda from 1970 to 2014. Meanwhile, (a) annual household disposable income (Yd) series was generated by adding consumption to investment spending and (b) time series for the logarithm of annual taxes was got by using the formula log(T)=log(Y/Yd), where Y denoted annual income. In data analyses, inferences were drawn by conducting tests of significance of the parameters. The tests were conducted by using the following types of test statistic: t–statistic, F–statistic, coefficient of determination (R^2) Durbin–Watson (DW) statistic, and heteroscedasticity t–statistic (H_1) as a test for constant variance.

Results

First, the t–test was conducted to establish whether a relationship existed between variables or not. To test the significance of the parameters, the null hypothesis was stated as $\beta_i=0$, if a relationship existed between the dependent and independent variables. The alternative hypothesis was $\beta_i\neq 0$, implying that a relationship existed, but there might have been either

a positive or negative association between the variables. By using the most common form of test of significance, each hypothesis testing was conducted as follows:

1. The null hypothesis was H_0: $\beta_i = 0$, if the null hypothesis was true. The alternative hypothesis was H_0: $\beta_i = 0$.
2. The test statistic was $t=b_i/(se(b_i)\sim t_{(N-2)}$ if the null hypothesis is true.
3. In the study, $\alpha = 0.05$ was used. The critical values for the two-tailed tests were the 2.5 percentile $t_{(0.025,40)}$=-2.021 and the 0.975 percentile $t_{(0.025,38)}$=-2.021 Each null hypothesis was rejected if the calculated value of $t\geq 2.021$ or if $t\leq 2.021$
4. The value of the test statistic was $t=b_i/(se(b_i)=4.88$.
5. Since $t=5.90,\ldots,17.03>2.021$ the null hypothesis that H_0: $\beta_i = 0$ was rejected and in each of the ten cases of the test of the significance of parameter. the null hypothesis was rejected, as indicated in Tables 1, 2 and 3 and the conclusion was that each of the parameters in the three models were significantly different from zero (Hills, Griffiths, & Lim, 2011).

Second, the t-test for heteroscedasticity, the tests were conducted as in the case of the normal t-test. Therefore, since $t=0.00<2.021$, the null hypothesis that H_0: $\beta_i = 0$, was accepted and in each of the three cases of the test of the significance of the parameter the null hypothesis was accepted as indicated in Tables 1, 2 and 3. Consequently, the conclusion drawn was that there was no heteroscedasticity in all the three models.

Third, in multiple regression, the coefficient of determination, or R^2,measures the proportion of variation in the dependent variable explained by all the explanatory variables. Therefore, in the three regression results obtained, the value of R^2, was 1, implying that the three models in Tables 1, 2 and 3 fitted the data perfectly well, that is, all the variations in the dependent variable could be explained by the variations in all the explanatory variables.

Fourth, given the k–variable regression model

$Y_i=\beta_i+\beta_2 X_{t2}+\beta_3 X_{t3}+\ldots+\beta_k X_{tk}+u_t$. (7)

To test the hypothesis $H_0:\beta_2=\beta_3=\ldots=\beta_k=0$.

That is all slopes coefficients are simultaneously zero, versus

H_0: Not all the coefficients are simultaneously zero.

Computation using the computer gives:

$$F = \frac{ESS/df}{RSSidf} = \frac{ESS/(K-1)}{RSS/(N-K)} = 7013775;12637796;9407961.$$

Since in all the three cases in Tables 1, 2 and 3 $F>F_\alpha\ (k-1,n-k)$ the H_0, is rejected, where $F_\alpha\ (k-1, n-k)$ is the critical F value at αlevel of significance and $(k-1)$ numerator of degrees of freedom $(n-k)$ denominator degrees of freedom. In other words, the comparisons are as follows: (7013 775>2.852);(12637796>3.238);(9407961>4.08) respectively.

Fifth, from the data given in Tables 1, the estimated d value is 1.96 (i.e. 2.04), suggesting that there is no negative serial correlation in the residuals. From the Durbin–Watson tables, it can be verified that for 42 observation and four explanatory variables, $d_u=1.72$ at 5 per cent

level. Since the computed *d* of 1.96 lies above d_u=*1.72* the null hypothesis can be accepted and thus it can be concluded that there is no negative serial correlation in the residuals.

Meanwhile, from the data given in Table 2, the estimated *d* value is 1.93 (i.e. 2.07), suggesting that there is no negative serial correlation in the residuals. From the Durbin–Watson tables, it can be verified that for 42 observation and three explanatory variables, d_u=*1.66*, at 5 per cent level. Since the computed *d* of 1.93 lies above d_u=*1.66*, the null hypothesis can be accepted and it, therefore, can be concluded that there is no negative serial correlation in the residuals.

Similarly, from the data given in Table 3, the estimated *d* value is 1.97 (i.e. 2.03), suggesting that there is no negative serial correlation in the residuals. From the Durbin–Watson tables, it can be verified that for 42 observation and two explanatory variables, d_u=*1.60* at 5% level. Since the computed *d* of 1.97 lies above d_u=*1.60*, the null hypothesis can be accepted and, hence, it can be concluded that there is no negative serial correlation in the residuals.

From Table 1, it can be discerned that a 1% increase in household consumption [C_n] (i.e. outcome from household labour) could have been responsible for a 0.68% increase in higher education enrolment *(H)* in Uganda during the 1973–2014 period. Meanwhile, a 1% rise in investment spending*(I)*at household level was associated with a 0.17% increase in higher education enrolment (HEE) in Uganda during the aforementioned period. This implies that a 1% increase in household financing *(Y_d)* could have contributed 0.85%, while a 1% rise in government financing*(G)* could have contributed 0.32% to (HEE).

Table 1

Dependent Variable: *d(log(H))/d(d(H²))*		
Independent Variables	Coefficient	t-Statistic
d(log(C_n))/d(d(H²))	0.68	5.90
d(log(I))/d(d(H²))	0.17	5.65
d(log(G))/d(d(H²))	0.32	7.24
d(log(X))/d(d(H²))	0.08	6.64
R^2=1.00,DW=2.04 F =7013775,N=42,H_T=0.00, Sample Period: 1973–2014		

Therefore, during the 1973–2014 period, private financing could have contributed more than twice as much as what government financing contributed to HEE in Uganda. During the given period, a 1% increase in exports *(X)* could have a 0.08% increase in HEE in the country.

Results from Table 2 corroborate the empirical finding that can be derived from Table 1 that during the given period private sector financing contributed more than government financing to HEE. That is because from Table 1, it is clear that during the given period a 1% increase in household consumption (private sector) financing might have contributed 0.84%, while government financing could have contributed 0.33% to HEE in Uganda. Hence, during the given period, private financing could have contributed more than twice as much as what government financing contributed to HEE in Uganda.

Table 2

Dependent Variable: *d(log(H))/d(d(H²))*		
Independent Variables	Coefficient	t-Statistic
d(log(Y_d))/d(d(H²))	0.84	12.60
d(log(G))/d(d(H²))	0.33	13.35
d(log(X))/d(d(H²))	0.08	11.69
R²=1.00, DW=2.07, F =12637796,N=42,H_T=0.00, Sample Period: 1973–2014		

From Table 1, the empirical results indicate that a 1% increase in economic growth could have been responsible for a 0.91% increase in HHE growth. Meanwhile, a 1% increase in taxes could have been responsible for a 0.91% increase in HEE in Uganda during the given period. Hence, financing production *(Y)* could have contributed more than what government financing contributed to HEE in Uganda. Results from Tables 1, 2 and 3 indicate that taxes *(T)* are as effective as government financing in enhancing higher education enrolment.

Table 3

Dependent Variable: *d(log(H))/d(d(H²))*		
Independent Variables	Coefficient	t-Statistic
d(log(Y))/d(d(H²))	0.91	7.16
d(log(T))/d(d(H²))	0.34	17.03
R²=1.00,DW=2.03, F =9407961,N=42,H_T=0.00, Sample Period: 1973–2014		

Discussion

There has been a tremendous increase in student enrolment to access higher education in Uganda since 2002 from about 80,000 in 2002 to 250,621 in 2014.

However, government has failed to make the Ugandan universities an engine of development through research and innovation. At universities in the country, there has been a greater increase in student enrolment (access) and programmes than in the numbers and quality of staff, facilities in laboratories and libraries that are vital to the proper functioning of the many universities (Teferra, 2015).

In the discussion of the empirical results, two factors that have enhanced enrolment in higher education institutions (HEIs) are examined. The two factors examined are (a) government financing and (b) private financing. Government funds mainly the teaching component of higher education; and in the last 25 years, funding of research has been left to foreign donors. The HEIs have been spending on average less than 5% of the annual budget on research. Meanwhile, the higher education sub-sector is shaped like an inverted pyramid

with more students in universities at the top; and then the technical sub-sector (or other tertiary institutions) at the bottom. This constitutes a ratio of 2.5 graduates to 1.0 technicians (Brown, 2008; Kasozi, 2016).

Moreover, in Uganda, demand for higher (tertiary) education has exceeded resources, leading to a decline in quality due to lack of money to purchase inputs. But access to higher education has remained low because it is determined by whether a student is from a rich family or not. It is mostly the rich who can afford to pay fees to access higher education. The country's average funding of public universities has averaged only 0.35% of GDP in the last 25 years. The very low public support to HEIs indicates that Uganda is unlikely to build a high-level skilled critical labour force required for the achievement of the country's development goals (Kasozi, 2016).

Earlier on, the number of students had grown from 5,000 in 1970 to 201,376 in 2013. The percentage growth in enrolment from 2000 to 2006 was 30% per annum. Meanwhile, from 2006 to 2010 the annual enrolment growth was 15% (NCHE, 2012). Owing to declining resources to finance higher education, amidst the increasing number of students demanding access to higher education, Uganda was rendered unable to match funding with enrolment. Public financing through recurrent contribution per higher education student in Uganda declined from US$2,532 in 1970 to US$1,113 and then to US$639 in 1985. Meanwhile, the higher education share of the Ministry of Education budget averaged 10-12% from 1996 to 2016. From 1997/98 to 2005/06, HEIs' share as a percentage of GDP average was only 0.73 (Kasozi, 2016). Thus, from 1970 to 2014, government financing on average was less than private financing of HEIs.

The HEIs were on average financed more by the private sector than by the government because by 2003, public funding had become inadequate to fully fund higher education and raise the tertiary gross enrolment ratio of 2.5% from elite status to the massification lower margin of 15%. Therefore, the government had no option but to allow private providers of higher education to supplement government initiatives to increase higher education enrolment. Since 2003, this policy has improved on access to higher education in Uganda. As a result, since 2003, private HEIs have overtaken public HEIs in numbers but not in enrolment. Thus, by 2012, out of the 34 universities registered, 29 were private; and out of 187 HEIs existing in 2012, 37 were private and only 50 were public (Kasozi, 2016, p. 133).

During the period 2003-2012, the majority of students in public universities were self-sponsored or private. Thus, the non-government sponsored students far outnumbered those whose fees were paid by the government in both private and public HEIs. As a result, the GER jumped from 2.5% in 2003 to 6% in 2012. By 2016, the GER of Uganda was still below the world average of 25%, and those of (a) Sub-Saharan Africa (7%), (b) Korea (100%), US (95%), Malaysia (40%) (Kasozi, 2016). Meanwhile, by 2005/06, the government-owned universities were only five out of 24 licensed universities and less than 30% of the 100 non-university tertiary institutions were government.

Government-sponsored students constituted only 19% (11,786) of the 59,592 students in public universities. The rest (80.2% - 47,806) were privately sponsored (paid for by non-government sources of financing). Private universities enrolled almost 40% of the students in the university sub-sector of HEIs (Kasozi, 2016). Most private universities in Uganda have more institutional freedom (autonomy) than public ones on how to use their funds. Therefore, most of the private HEIs are developing very fast in the area of infrastructural education facilities (Kasozi, 2016).

The students' loan scheme has played a negligible role in the promotion of enrolment in HEIs in Uganda. For instance, in early 2017, the Higher Education Students Financing Board (HESFB) was faced with a UGX 5.6 billion financial shortage. The loans were required for funding the admission of new students to different universities. This board was established in 2014 by the Higher Education Students Financing Act No.2 of 2014 as a corporate body to provide loans and scholarships to brilliant and needy students to enable them to pursue higher education in Uganda (HESFB, 2020).The loans were meant to cater for tuition fees, research and functional fees. By mid-2017, the government was due to release the funds required to facilitate new students joining the nine public universities and selected chartered private universities in the 2017/18 academic year.

Moreover, a further UGX 6 billion had not been released to facilitate payment for continuing students. If the money was released late, the board could have failed to call for new students to apply for loans and scholarships. The scheme could provide funding to students for tuition and functional fees; it could not provide for accommodation and food. Thus, some students were forced to drop out of school, especially those from poor families.

But the board was assured that government was seeking money to fund the new students. The scheme could have been riddled with unfair distribution of the loans because the most vulnerable districts were awarded fewer slots compared to the fairly developed ones; although some individuals were arguing that the loans were given on merit. According to HESFB statistics, at least 7,399 students had benefited from the scheme. Therefore, in the 2014/15 financial year, 1,201 out of 2,125 applicants were awarded the loan. In the financial year 2015/16, 1,273 out of 4,399 applicants were awarded the loan. In the 2016/17 financial year, 1,325 out of 3,762 applicants were awarded the loan (Parliament Watch, 2021).

The higher education loan scheme in Uganda has been by far less successful than that in India. That is because (a) the approval rate of an education loan in India has been about 85%, and (b) from the time of its inception, the number of education loans increased from 0.11 million in 2000/01 to 2.9 million in 2013/14. The increase in student enrolment in higher education was phenomenal and was growing at an annual average rate of 38%, while the rate of growth of government expenditure was 15%. In 2000/01, the share of education loans constituted around 8.8% of total expenditure on higher and technical education, and increased to 85% by 2006/07. Meanwhile, since 2007/08, funding of education loans in India exceeded government expenditures on higher and technical education (Rani, 2016).

Conclusion

Empirical results show that in Uganda, during the period 1970 – 2014, private sector financing growth was more effective than government financing growth in driving up enrolment in higher education. In the following two decades, through the implementation of the student loan scheme in the same way India executed it, could cause a phenomenal increase in students' enrolment in HEIs. In the near future, Uganda could use the proceeds from oil to fund and drive up enrolment in higher education just as Botswana drove up enrolment in higher education by utilising earnings from diamond to finance higher education enrolment and attained a tertiary gross enrolment rate of 38.848% in 2018 (Moremi, 2018; UNESCO, 2020).

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NATIONAL COUNCIL FOR HIGHER EDUCATION

Plot M834, Kigobe RoadP.O.Box 76 Kyambogo - Kampala
Tel: +256 393 262 140/4 Fax: 256 393 262 145
Email: info@unche.or.ug
Website: www.unche.or.ug