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CONTENTS

About the Journal v

Role of Higher Education Growth in Enhancing Economic Growth, Innovation Advancement and Technological Progress in Uganda (1970–2014) 1

Jimmy Alani (Phd Candidate), Bruno Yawe (Phd), John Mutenyo (Phd)

Building Educational Research Capacity: Challenges and Opportunities from the Perspectives of Faculty Staff of Selected Private Universities in Uganda 19

Rosemary Nakijoba (PhD), Awobamise Ayodeji O. (PhD)

Research Management and Research Productivity among Lecturers at Kyambogo University, Uganda 35

Moses Kanaabi, George Wilson Kasule, Philip Owino

Policy Support and Research Productivity among Lecturers in Ugandan Public Universities: Case of Kyambogo University 52

Moses Kanaabi, George Wilson Kasule, Philip Owino

Enhancing Research Output in Higher Institutions of Learning: A Case Study of Busitema University Research Model 68

Asaph Keikara Muhumuza, Fulgensia Kamugisha Mbabazi, Rebecca Muhumuza Nalule, Abubakar Mwasa, Annet Kyomuhangi, Stephen Kadedesya

University Sustainable Development and Management of Academic Staff in Higher Institution of Learning in Central Uganda 86

Nabakiibi Agnes (PhD)

Information Communication Technologies and Implementation of Education for Sustainable Development in Higher Education in Uganda: A case of Busitema University 100

Margaret Stella Ujeyo, Rovincer Najjuma, Ronald Bisaso

Employee Engagement and Job Performance among Academic Staff in Public Universities in Uganda 114

Emmanuel Nachonga, Leon Matagi, Lydia Emuron

Satisfaction with Human Resource Management Practices and Job Performance of Academic Staff in Public Universities in Uganda: A Case of Kyambogo University 145

George Wilson Kasule, Wilson Mugizi, Joseph Rwothumio

Talent Management: The Game Changer for Work Engagement of Non-Teaching Workforce at Kyambogo University, Uganda 164

Wilson Mugizi, Joseph Rwothumio, Mark Micheal Waiswa, Wilberforce Turyahikayo

PhD Studentship and Research Supervisors during the COVID-19 Pandemic at a Premier University in Uganda 181

Enoch Kimanje, Olive Lunyolo

Using the European Customer Satisfaction Index (ECSI) Model to Examine Student Satisfaction in the Context of Universities in Uganda 197

Martha Kyoshaba, Fred E. K. Bakkabulindi, Christopher B. Mugimu

Factors Affecting Students' Performance, Enrolment and Retention in Science Subjects in Secondary Schools in Uganda: A Case Study of Kigezi Region of Uganda 212

Proscovia Namayanja, Edwin Akugizibwe, Damian Kajunguri, Ronald Katende, Tumuhimbise Edson Bazeyo

Overcoming Policy and Practice Fragility and Enhancing Security of Science, Technology and Innovation Educational Achievement for Females in Uganda 229

Mary N. Okwakol, Margaret Stella Suubi Ujeyo, Dennis Zami Atibuni, Biira Saphina, Paul Waako

How Internationalised Is Your Curriculum? University Graduate Students Speak Out 244

Justin Ayebare, Muhamadi Kaweesi

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.

The journal publication is done twice a year, that is in May and September. The journal is 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.

The objective of the journal is to publish original research on higher education. The primary aim of this journal is the dissemination of important research work that will promote a sustainable, accessible and quality higher education that is relevant for social transformation.

Aims and Scope

The *Uganda Higher Education Review* is a broad-based journal that covers all aspects of higher education. Papers containing new ideas, creative approaches and/or innovative applications are welcome. Papers that discuss the theory, practice and policies relating to the role, development, management and improvement of higher education from national, regional and international viewpoints are sought.

NB: The journal is open access.

This journal is a product of the call for papers and research areas of focus in this volume10, issue 1, 2022, and include the following:

1. General enrolment ratio (GER).
2. Sustainable development and management of academic staff.
3. Higher education funding.
4. Innovations to increase STEM enrolment as well as supporting the teaching and learning of STEM.
5. Building research and innovation capacity.

Role of Higher Education Growth in Enhancing Economic Growth, Innovation Advancement and Technological Progress in Uganda (1970–2014)

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Abstract[4]

We examine the role of growth in higher education in enhancing economic growth, innovation advancement and technological progress in Uganda during the 1970 to 2014 period. Higher education is measured by the higher (tertiary) education gross enrolment ratio (GER). The major hypothesis of the study is that "Higher education growth enhances economic growth, innovation advancement and technical progress". The study is important because Uganda still has low levels of higher education GER, innovation and technology. Data set employed in the empirical analyses was obtained from the United Nations statistics database and analyzed using the generalised least squares (GLS) technique. First, we find that a 1% increase in higher education GER growth had the potential of causing economic growth, innovation advancement, technological progress and total factor (TF) to increase by 0.82, 0.10, 0.27 and 0.56%, respectively, during the given period. Second, empirical evidence shows that a 1% increase in economic growth, innovation advancement, technological progress and TF the potential of causing higher education GER growth to increase by 1.08, 5.02, 1.36 and 1.42%, respectively, during the given period. Third, over the given period, a 1% growth in innovation, technical progress

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and TF productivity had the potential of causing economic growth to increase by 4.63, 1.33 and 1.14 %, respectively. Fourth, a 1% growth in higher education GER had the potential of causing a rise in labour generation and capital accumulation growth by 0.53 and 1.56%, respectively.

Keywords: *Economic growth; Higher school education growth; Innovation advancement; Input productivity growth; Technological progress.*

Introduction

We examine the role of growth in higher education in enhancing economic growth, innovation advancement and technological progress in Uganda during the 1970 to 2014 period. Higher education is measured by the higher education gross enrolment ratio (GER). The country's higher education (HGER) declined from 6.85% in 2017/2018 to 6.81% in 2018/2019. Thus, during the 2017 to 2019 period, the HGER was far below the world average of 24% and 40% required for economic take-off (National Council for Higher Education [NCHE], 2018, p. 6). The major hypothesis of the study is that "Higher Education enhances economic growth, innovation and technical progress". The study is important because Uganda still has low levels of higher education GER, innovation and technology. Meanwhile, it is the first time in the history of economic research that the theoretical framework and methodology involving causal theory are being applied to investigate the hypothesis that "growth of the dependent variable depends on its acceleration and growth of the first lag of the independent variable". Data set employed in the empirical analyses was obtained from the United Nations and World Bank statistics and analysed using the generalised least squares (GLS) technique. A huge body of research shows that investments in education provide students with long-run benefits. However, little is known about the role of education in enhancing innovation (Biasi et al., 2021). Although higher education growth enhances economic growth, innovation advancement and technical progress, innovation advancement can also directly affect higher education growth (Biasi et al., 2021). Meanwhile, education has been regarded as the principal determinant of endogenous economic growth (Chen et al., 2021). Indeed, tertiary (higher) education plays a major role in enhancing innovation, research, technological progress and sustainable development. Moreover, tertiary education growth directly affects economic growth and employment generation. Tertiary education is at the heart of the knowledge economy (Muresan & Gogu, 2012). The ultimate goal of economic innovation growth is economic growth. Higher education is very important because it provides the advanced skills necessary for a high innovation environment. One of the economic measures of innovation is labour productivity (Hoareau et al., 2013).

Other measures of innovation are capital productivity, technology or a combination of all the three drivers of innovation. On the other hand, innovation and capital supply are some of the ingredients of technological foundation (Diwan & Chakarborty, 1992). Meanwhile, technology is embodied materially in a product and composed of creating tangible objects, codified knowledge and know-how embedded in humans (Carayannis et al., 2015).

Methods

Theoretical framework for causality between dependent and independent variables

The theoretical framework aims at developing models that can provide tight relationships between the dependent and independent variables of concern. In economics, if the quantity of a variable, say the level of technology *(A)*, is measured in terms of logarithm *log* (A_t), then the growth rate $d[log(A_t)]$ of variable *A* at time *t* can be defined by

$$d[log(A_t)] = log(A_t) - log(A_{t-1}). \quad (2.1)$$

Or $$log(A_t) = log(A_{t-1}) + d[\log(A_t)]. \quad (2.2)$$

Given that the level of technology depends on the level of higher education , then

$$log(A_{t-1}) = f[log\ (H_{t-1}). \quad (2.3)$$

We use timing evidence based on the philosophical principle that if one event occurs after another, the second event must have been caused by the first (Mishkin, p.116).

The principle is valid if we know that the variables behind the events are endogenous. Therefore, the substitution of Equation (2.3) in (2.2) provides

$$log(A_t) = f[d\ [log\ (A_t)]] \quad (2.4)$$

$$log(A_t) = f[d[log(A_t)]]. \quad (2.4)$$

Otherwise $$log(A_t) = f[log(H_{t-1}), d[log(A_t)]].$$

Or $$d(log(A_t)) = \frac{\partial(log(A_t))}{\partial(log(H_{t-1}))} d(log(H_{t-1})) + \frac{\partial(log(A_t))}{\partial(\partial(log(A_t)))} d(d[log(A_t)]). \quad (2.5)$$

Or $$d(log(A_t)) = \frac{d(log(A_t))}{d(log(H_{t-1}))} d(log(H_{t-1})) + \frac{d(log(A_t))}{d(d(log(A_t)))} d[d(log(A_t))]. \quad (2.6)$$

Since $$\frac{d(log(A_t))}{d(log(H_{t-1}))} = \left[\frac{d(log(A_t))}{d(log(H_{t-1}))} \frac{log(H)_{t-1}}{log(A_t)}\right] \left[\frac{log(A_t)}{log(H_{t-1})}\right] = \beta_{LR} \left[\frac{log(A_t)}{log(H_{t-1})}\right] = \beta_1, \quad (2.7)$$

and $$\frac{d(log(A_t))}{d(d(log(A_t)))} = \left[\frac{d(log(A_t))}{d(d(log(A_t)))} \frac{d(log(A_t))}{log(A_t)}\right] \left[\frac{log(A_t)}{d(log(A_t))}\right] = \beta_{LR} \left[\frac{log(A_t)}{d(log(A_t))}\right] = \beta_2 \quad (2.8)$$

$$d(log(A_t)) = \beta_1 d(log(H_{t-1})) + \beta_2 d[d(log(A_t))]. \quad (2.9)$$

The elasticity β_1 measures the slope of the level of technology curve plotted on the log-log scatter diagram. The plotted curve represents how the log of the level of technology changes as the log of the level of higher education changes. Meanwhile, elasticity β_2 measures the slope of the level of technology curve plotted on the log-log scatter diagram. The plotted curve represents how the log of the level of technology changes as the log of the level of technology accelerates. Hence, Equation (2.9) provides a means of getting estimates of the effects of growth in higher education (H_{t-1}) on growth in innovation (Z_t), total factor (TF_t), aggregate income (Y_t), capital (K_t) and labour (L_t), respectively. Where (X_t) represents the following: A_t, Z_t, TF_t, Y_t, K_t and L_t.

$$\therefore \quad d(log(X_t)) = \beta_1\ d(log(H_{t-1})) + \beta_2\ d[d(log(X_t\ ))]. \quad (2.10)$$

Meanwhile, Equation (2.11) provides the tool for estimation of the feedback effects of growth in technology (A_t), innovation (Z_t), total factor (TF_t), aggregate income (Y_t), capital (K_t) and labour (L_t), respectively, on growth in higher education. Where X_{t-1} represents the following: A_{t-1}, TF_{t-1}, Y_{t-1}, K_{t-1} and L_{t-1}.

$$d(log(H_t)) = \beta_1\ d(log(X_{t-1})) + \beta_2\ d[d(log(H_t\ ))]. \quad (2.11)$$

Similarly, Equation (2.12) gives the tools for estimation of the influence of growth in innovation (Z_t),, technology (A_t) and level of total factor (TF_t), respectively, on economic growth (Y_t). Where X_{t-1} represents the following: Z_t, A_{t-1}, Y_{t-1} and TF_{t-1}.

$$d(log(Y_t)) = \beta_1\ d(log(X_{t-1})) + \beta_2\ d[d(log(Y_t\ ))]. \quad (2.12)$$

Lastly, Equations (2.13) to (2.32) depict the technique for the estimation of effects of growth in innovation (Z_{t-1}) on growth in capital (K_t) and labour (L_t) and technology (A_t) respectively. Where X_{t-1} represents the following: A_t, K_t and L_t.

$$d(log(K_t)) = \beta_1\, d(log(Z_{t-1})) + \beta_2\, d[d(log(K_t))]. \quad (2.13)$$

Data types and data sources

Annual time series data covering the 1970 to 2014 period was collected on gross capital formation, i.e. investment (I), household consumption (C_n) and Gross Domestic Product (Y), from the database of the United Nations (UN) and the World Bank. Meanwhile, annual time series data for the 1970 to 2014 period on higher education gross enrolment ratio (H) was collected from the World Bank website.

Data generation process

Literature shows that many studies have investigated the contribution of total factor productivity (TFP) to economic growth (Kim & Park, 2017; Woo, 1998; Wu, 2008; Young, 2003). These studies take part of the contribution of TFP to be the residual of economic growth not explained by the changes in factor inputs (Wu, 2010).

This study extends the current method of computing the level of innovation by defining it not as the residual of the level of technology but presenting it as a function of capital and labour productivity. To define TFP, the Cobb-Douglas version of the production function in use is given by output (Y) as a function of technology (A), capital (K), labour (L) and parameters α, β (Lipsey & Carlaw, 2004).

$$Y=AK^{\alpha}L^{\beta}. \quad (2.14)$$

where $0 < \alpha + \beta < 1$.

The TFP is calculated by dividing through Equation (2.14) by the total factor $K^{\alpha}L^{\beta}$ to provide

$$TFP = \frac{Y}{K^{\alpha}L^{\beta}} = A \quad (2.15)$$

Similarly, to define innovation (Z), the Cobb-Douglas version of technology function in use is represented by the level of technology (A) as the function of innovation (Z), capital productivity (K_p), labour productivity (L_p) and parameters α, β.

$$A = ZK_p{}^{\alpha}L_p{}^{\beta}. \quad (2.16)$$

where $Z = Y1\text{-}\alpha\text{-}\beta = AK_p{}^{-\alpha}L_p{}^{-\beta}$. (2.17)

Meanwhile, higher (tertiary) education is the main pillar of the knowledge economy, technological progress and innovation (Muresan & Gogu, 2012).

The level of higher education is measured by tertiary education gross enrolment ratio (). According to the (NCHE, 2018, p. 1), the *higher education GER* is a statistical measure of the *total number of students enrolled in higher education institutions (HEI) regardless of age* () as a percentage of the official age group corresponding to this level of education, i.e. *total population in the age group that is meant to be at HEI* (). Therefore,

$$GER = TN/TP. \quad (2.18)$$

Measurement of capital, labour, technology and innovation

Depreciation is the decline in value of the capital stock over time and can be represented as provided by Hill (1997). Mathematically, we represent depreciation as follows:

$$\delta_t K_{t-1} = D_t = V_{t-1} - V_t, \qquad V_{t-1} > V_t. \quad (2.19)$$

Where δ_t is the rate of depreciation at time t, while V_{t-1} is the value of capital at time $t-1$; while V_t is the value of capital at time t.

Equation (2.19) can be rewritten as

$$\delta_t = \frac{D_t}{K_{t-1}} = \left[\frac{K_{t-1}}{K_{t-1}} - \frac{K_t}{K_t - 1}\right]. \quad (2.20)$$

But $$\delta_t = \frac{D_t}{K_{t-1}} = -\left[\frac{K_t - K_{t-1}}{K_{t-1}}\right]. \quad (2.21)$$

$\therefore$ $$\delta_t = -\left[\frac{K_t - K_{t-1}}{K_{t-1}}\right] = \frac{dK_{t-1}}{K_{t-1}} = \frac{I_{t-1}}{K_{t-1}}. \quad (2.22)$$

$\therefore$ $$K_{t-1} = \frac{I_t}{\delta_t}. \quad (2.23)$$

Hence, Equation (2.22) can best be represented in logarithm form as follows:

$$\delta_t = -log(I_{t-1}). \quad (2.24)$$

Since $$\delta_t = \frac{I_{t-1}}{K_{t-1}} = -d[\log(K_{t-1})] = -log(I_{t-1}). \quad (2.25)$$

Where $$-d[\log(K_{t-1})] = -[log(K_{t-1}) - log(K_{t-2})] = -log(I_{t-1}). \quad (2.26)$$

$$\therefore -[log(K_{t-1}) - log(K_{t-2})] = -[log(I_1.I_2 \dots I_{t-2}.I_{t-1}) - log(I_1.I_2 \dots I_{t-2})] = -log(I_{t-1}). \quad (2.27)$$

Most importantly, it can be discerned from Equation (2.26) that decline in the rate of depreciation is a slope of the value of the depreciation curve and can be expressed as follows:

$$log(\delta_t) = log(1) - log[log(I_{t-1})]. \quad (2.28)$$

Here it is clear that the Therefore, rewriting Equation (2.10) gives

$$log(\delta_t) = log[1/log(I_{t-1})]. \quad (2.29)$$

Taking the antilog of Equation (2.29) provides

$$\delta_t = \frac{1}{log(I_{t-1})} \quad (2.30)$$

Hence, the substitution of Equation (2.30) in (2.23) provides a novel formula that can be used to measure the quantity of capital stock provided the level of investment is known.

$$K_{t-1} = I_{t-1}\, log(I_{t-1}) \quad (2.31)$$

Having obtained the time series data on the annual long run capital stock (K_{t-1}) and aggregate disposable income (Y_{dt}), the annual quantities of labour (L_{t-1}) can be generated by using the classical Cobb-Douglas production function [$Y_{dt} = K_{t-1}^{\alpha} L_{t-1}^{\beta}$] and by causality theory (Mishkin, 2004, p. 116), where is average propensity to invest (MPI_t) and β is average propensity to consume (APC_t) From the Cobb-Douglas we make L_{t-1} the subject and obtain

$$L_{t-1} = [Y_{dt}/((K_{t-1})^{(API_t)})]^{[1/APC_t]}. \quad (2.32)$$

since the long run equals long-run Implying, marginal propensity to invest (MPI_t) and average propensity to invest (API_t) are equal in the long run (Hadden, 1965, p. 9).

The generalised least squares method (GLS)

If variance of the error term $\boldsymbol{\Sigma}$ is known, then it is possible to form a Cholesky decomposition as follows:

$$P'P = \Sigma^{-1} \quad (2.33)$$

where matrix denotes an upper triangular matrix. Manipulation of Equation (2.33) gives

$$P'P\Sigma = I_n. \quad (2.34)$$

Thus $$P'P\Sigma P' = P' \quad (2.35)$$

Therefore, $$P\Sigma P' = I_n \quad (2.36)$$

In general, we can write a linear regression equation as follows:

$$y = X\beta + \varepsilon. \quad (2.37)$$

where $E(\varepsilon) = 0$ and $Var(\varepsilon) = \Sigma$ and $\boldsymbol{\Sigma}$ is a general symmetric positive definite matrix. But this general case suffers from heteroscedasticity and autocorrelation. In the case of ordinary least squares (OLS) with heteroscedasticity or autocorrelation or both, the OLS is biased, has a variance different from the previous one, provides invalid tests statistic and is inefficient.

In order to minimise or get rid of heteroscedasticity or autocorrelation, we pre-multiply Equation (2.37) by the vector and obtain the following:

$$Py = PX\beta + P\varepsilon. \quad (2.38)$$

Therefore, Equation (2.38) can be rewritten in the OLS format as follows:

$$y^* = X^*\beta + \varepsilon^*. \quad (2.39)$$

Meanwhile, the variance of $\varepsilon^* = P\varepsilon$ is given by

$$(P\varepsilon\varepsilon'P') = P\Sigma P' = I_n. \quad (2.40)$$

Hence, given that $E(\varepsilon) = 0$ & $Var(\varepsilon) = I_n$, Equation (2.37) satisfies the classical assumptions. Thus, the GLS is just the OLS applied to the transformed model such that

$$\hat{\beta}_{GLS} = (X^{*\prime}X^*)^{-1}X^{*\prime}y^*. \quad (2.41)$$

Or

$$\hat{\beta}_{GLS} = (X'PP'X)^{-1}X'PP'y. \quad (2.42)$$

Therefore,

$$\hat{\beta}_{GLS} = (X'\Sigma^{-1}X)^{-1}X'\Sigma^{-1}y. \quad (2.43)$$

The variance of the GLS estimator can be obtained as follows:

$$E\left[(\hat{\beta}_{GLS} - \beta)(\hat{\beta}_{GLS} - \beta)'\right] = E\left[(X^{*\prime}X^*)^{-1}X^{*\prime}\varepsilon^*\varepsilon^{*\prime}X^*(X^{*\prime}X^*)^{-1}\right]. \quad (2.44)$$

$$\therefore \quad E\left[(\hat{\beta}_{GLS} - \beta)(\hat{\beta}_{GLS} - \beta)'\right] = (X^{*\prime}X^*)^{-1}X^{*\prime}X^*(X^{*\prime}X^*)^{-1}. \quad (2.45)$$

Hence,

$$Var\left(\hat{\beta}_{GLS}\right) = (X^{*'}X^*)^{-1} = (X'\Sigma^{-1}X)^{-1}. \quad (2.46)$$

The GLS estimator is more efficient than the OLS estimator because the GLS is a model that fulfils the classical assumptions based on the Gauss-Markov theorem, but the OLS does not due to the presence of autocorrelation and heteroscedasticity.

The GLS estimator is more efficient than the OLS estimator due to the fact that

$$Var(\hat{\beta}) - Var(\hat{\beta}_{GLS}) = (X'X)^{-1}X'\Sigma X(X'X)^{-1} - (X'\Sigma^{-1}X)^{-1} = A\Sigma A',$$

since $A = [(X'X)^{-1}X' - (X'\Sigma^{-1}X)^{-1}X'\Sigma^{-1}]$ (Creel, 2014, pp.121–176).

Estimation of MPC, MPI, technology and innovation

We find that all the saving motives are psychological saving motives. As a result, the empirical findings show that the psychological savings motive determines the planned level of consumption C^*_{nt} in period t, measured in terms of the level of consumption and savings ($C_{nt-1} - S_{t-1}$) in period $t - 1$. The savings motive hypothesis (SMH) generates a psychological consumption-savings relationship given by $C^*_{nt} = C_{nt-1} - S_{t-1}$.

Meanwhile, in the SMH, the level of savings (S_{t-1}) is constant and identical to the level of the observed initial investment in the annual investment series ($C_0 = S_{t-1} \equiv I_1$) It is true that the consumption function ($C_{nt-1} = C_0 + Y_t$) arising from the SMH is more accurate than the usual Keynesian consumption function ($C_{nt} = C_0 + Y_t$), when it comes to providing more accurate estimates for the Thus, regression of annual time series of C_{nt-1} on Y_{at} provides a regression-line. Here, H_T is a t used in testing for heteroskedasticity. (See Appendix 12.1 for details.)

$$\frac{\hat{C}_{nt-1}}{d(d(C^2_{nt-1}))} = \frac{1.41\times10^{10}}{d(d(C^2_{nt-1}))} + \frac{0.628115Y_t}{d(d(C^2_{nt-1}))}. \quad (2.47)$$

$$t \qquad 28.73 \qquad 48.22$$

$$R^2 = 1.0000 \quad DW = 1.90 \quad N = 41 \quad H_T = 0.04 \quad \text{period: 1974–2014}$$

By using the GLS method, the marginal propensity to invest (MPI) was obtained as follows:

$$\frac{\log(Y_t/\widehat{Cn}_{(t-1)})}{d(d(Y^2_{dt}))} = \frac{0.155753(\log(10))}{d(d(Y^2_{dt}))}. \quad (2.48)$$

$$t \qquad 256.53$$

$$R^2 = 0.999 \quad DW = 2.00 \quad N = 42 \quad H_T = 0.11 \quad \text{period: 1973–2014}$$

(See Appendix 12.2. for details.) And it can be verified that the log of GDP to lag of consumption $[log(Y_t/C_{nt-1})]$ equals the $MPI = \alpha$. Hence, the annual levels of technology and innovation were respectively estimated by the formulae given in Equation (2.50).

$$A_t = \frac{Y_t}{[K^{\alpha}_t.L^{\beta}]} = \frac{Y_t}{[K^{0.155753}_t.L^{0.628115}]}. \quad (2.49)$$

$$Z_t = Y^{1-\alpha-\beta}. \quad (2.50)$$

Explanation of the parameter values obtained from data

Given that the parameters on capital is defined as, say, capital elasticity of income.

Thus, $[\partial(log(Y))/\partial(log(K))]$. (2.51)

This expression demonstrates that, given the Cobb-Douglas production function as provided in Equation (2.14), the capital coefficient (parameter) can be expressed as follows:

$$\alpha = \frac{\alpha}{1} = \frac{dY}{dK} = \frac{\partial Y}{\partial K}.\frac{K}{Y} = \frac{\partial Y/Y}{\partial K/K} = \frac{\partial(\log(Y))}{\partial(\log(K))} = \epsilon. \quad (2.52)$$

(Varian, 2010, pp.190–191). Thus, a 1% increase in the growth of capital $[\partial(log(K))]$ causes economic growth output to increase by by $\alpha = \partial(log(Y))/1\%$ yearly, other things being equal. Therefore, all the parameter values of concern were found to be significantly different from zero, while the H_T & DW indicated no cases of heteroskedasticity and autocorrelation.

Results

First, we find that a 1% increase in higher school education GER had the potential of causing economic growth, innovation advancement, growth in capital, labour, technological progress and total factor (TF) advancement to increase by 0.82, 0.10, 1.56, 0.53, 0.27 and 0.56%, respectively, during the given period (see Tables 1, 2 and 3).

Table 1: Effects of higher school education on (1) technology and (2) innovation

Regression Model 1			**Regression Model 2**		
Dependent Variable: **d(log(A))**/d(d((A/H			Dependent Variable: **d(log(Z))**/d(d((TF/H		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(H(-1)))/d(d((A/H	0.27	57.21	**d(log(H(-1)))**/d(d((TF/H	0.10	6.77
d(d(log(A)))/d(d((A/H	0.74	8.540	**d(d(log(Z)))**/d(d((TF/H	1.21	6.99
Adjusted Sample: 1973-2014			Adjusted Sample: 1973-2014		

Data source: Models 1 and 2 were obtained from the GLS regressions conducted.

NB: Regressions 1 to 2 were found to be free from autocorrelation and heteroscedasticity.

Table 2: Effects of higher school education on (3) total factor and (4) income

Regression Model 3			**Regression Model 4**		
Dependent Variable: **d(log(TF))**/d(d((Y/H			Dependent Variable: **d(log(Y))**/d(d((Y/H		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(H(-1)))/d(d((Y/H	0.56	12.58	**d(log(H(-1)))**/d(d((Y/H	0.82	19.87
d(d(log(TF)))/d(d((Y/H	0.65	8.039	**d(d(log(Y)))**/d(d((Y/H	0.20	1.75
Adjusted Sample: 1973-2014			Adjusted Sample: 1974-2014		

Data source: Models 3 and 4 were obtained from the GLS regressions conducted.

Table 3: Effects of higher school education on (5) capital and (6) labour

Regression Model 5			**Regression Model 6**		
Dependent Variable: **d(log(K))**/d(d(			Dependent Variable: **d(log(L))**/d(d(		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(H(-1)))/d(d(	1.56	22.50	**d(log(H))**/d(d(	0.53	58.15
d(d(log(K)))/d(d(	0.59	6.371	**d(d(log(L)))**/d(d(	0.03	0.399
Adjusted Sample: 1974-2014			Adjusted Sample: 1973-2014		

Data source: Models 5 and 6 were obtained from the GLS regressions conducted.

Second, empirical evidence shows that a 1% increase in economic growth, innovation advancement, capital accumulation, labour generation, technological progress and TF growth had the potential of causing higher education GER growth to increase by 1.08, 5.02, 0.45, 1.84, 1.36 and 1.42%, respectively, during the given period (see Tables 4, 5 and 6).

Table 4: Effects of (7) technology and (8) innovation on higher school education

Regression Model 7			**Regression Model 8**		
Dependent Variable: **d(log(H))**/d(d(			Dependent Variable: **d(log(H))**/d(d(		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(A(-1)))/d(d(	1.36	123.3	**d(log(Z(-1)))**/d(d(	5.02	4.76
d(d(log(H)))/d(d(	1.07	31.81	**d(d(log(H)))**/d(d(	0.47	9.21
Adjusted Sample: 1973-2014			Adjusted Sample: 1973-2014		

Data source: Models 7 and 8 were obtained from the GLS regressions conducted.
NB: Regressions 7 to 8 were free from autocorrelation and heteroscedasticity.

Table 5: Effects of (9) TF and (10) innovation on higher school education

Regression Model 9			**Regression Model 10**		
Dependent Variable: **d(log(H))**/d(d((TF/H			Dependent Variable: **d(log(H))**/d(d(		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(TF(-1)))/d(d((TF/H	1.42	29.59	**d(log(Y(-1)))**/d(d(	1.08	6.77
d(d(log(H)))/d(d((TF/H	0.44	5.103	**d(d(log(H)))**/d(d(	0.47	6.99
Adjusted Sample: 1973-2014			Adjusted Sample: 1973-2014		

Data source: Models 9 and 10 were obtained from the GLS regressions conducted.

Table 6: Effects of (11) labour and (12) capital on higher school education

Regression Model 11			**Regression Model 12**		
Dependent Variable: **d(log(H))**/d(d((A/H			Dependent Variable: **d(log(H))**/d(d(		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(K))/d(d((TF/H	0.45	32.18	**d(log(L))**/d(d(	1.84	77.65
d(d(log(H)))/d(d((A/H	0.59	4.05	**d(d(log(H)))**/d(d(	0.15	2.437
Adjusted Sample: 1973-2014			Adjusted Sample: 1973-2014		

Data source: Models 11 and 12 were obtained from the GLS regressions conducted.

Third, over the given period, a 1% growth in innovation, technical progress and total factor productivity growth had the potential of causing economic growth to increase by 4.63, 1.33 and 1.14 %, respectively (see Tables 7 and 8).

Table 7: Effects of (13) technology and (14) innovation on income

Regression Model 13			**Regression Model 14**		
Dependent Variable: **d(log(Y))**/d(d(			Dependent Variable: **d(log(Y))**/d(d(		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(A(-1)))/d(d(	1.33	4.589	**d(log(Z(-1)))**/d(d(	4.63	7
d(d(log(Y)))/d(d(	0.71	22.73	**d(d(log(Y)))**/d(d(	1.00	3
Adjusted Sample: 1974-2014			Adjusted Sample: 1974-2014		

Data source: Models 13 and 14 were obtained from the GLS regressions conducted.

Table 8: Effects of (15) total factor on income; and (16) innovation on labour

Regression Model 15			Regression Model 16		
Dependent Variable: d(log(Y))/d(d((A/H			Dependent Variable: d(log(L))/d(d((		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(TF(-1)))/d(d((A/H	1.14	8.448	d(log/d(d((	3.14	38.91
d(d(log(Y)))/d(d((A/H	0.54	2.596	d(d(log(L)))/d(d((	0.26	11.65
Adjusted Sample: 1973-2014			Adjusted Sample: 1974-2014		

Data source: Models 15 and 16 were obtained from the GLS regressions conducted

Table 9: Effects of innovation on (17) capital, and (18) technology

Regression Model 17			Regression Model 18		
Dependent Variable: **d(log(K))**/d(d(			Dependent Variable: **d(log(A))**/d(d(		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(Z(-1)))/d(d(	4.60	10.34	**d(log(Z(-1)))**/d(d(	1.97	21.84
d(d(log(K)))/d(d(	-0.39	-3.658	**d(d(log(A)))**/d(d(	0.65	3.586
Adjusted Sample: 1973-2014			Adjusted Sample: 1973-2014		

Data source: Models 17 and 18 were obtained from the GLS regressions conducted.
NB: All the regressions were found to be free from autocorrelation and heteroscedasticity.

Fourth, a 1% increase in innovation advancement had the potential of causing a rise in labour generation, capital accumulation and technological growth by 3.14, 4.60 and 1.97%, respectively (see Tables 8 and 9 above).

Fifth, a 1% increase in higher school enrolment growth could have caused growth in labour productivity and capital productivity to rise by 0.55 and 0.28 %, respectively, in Uganda during the given period (see Tables 19 and 20).

Last, a 1% increase in innovation advancement could have caused growth in labour productivity and capital productivity to rise by 3.75 and 1.81 %, respectively, in Uganda during the given period (see Tables 20 and 21). The study is important for informing the innovation and higher education policies of Uganda. See Appendix 12.3 for summary.

Table 10: Effects of higher school education on (19) labour productivity and (20) capital productivity.

Regression Model 19			Regression Model 20		
Dependent Variable: **d(log(LP))**/d(d(			Dependent Variable: **d(log(KP))**/d(d(		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(H(-1)))/d(d(	0.55	7.19	**d(log(H(-1)))**/d(d(	0.28	5.25
d(d(log(LP)))/d(d(	-1.00	-17.13	**d(d(log(KP)))**/d(d(	0.40	4.72
Adjusted Sample: 1973-2014			Adjusted Sample: 1973-2014		

Data source: Models 19 and 20 were obtained from the GLS regressions conducted.

NB: Regressions 19 to 20 were free from autocorrelation and heteroscedasticity.

Table 11: Effects of innovation on (21) labour productivity and (22) capital productivity

Regression Model 21			**Regression Model 22**		
Dependent Variable: **d(log(LP))**/d(d(			Dependent Variable: **d(log(KP))**/d(d(		
Independent Variable	Coeff.	t-Stat.	Independent Variable	Coeff.	t-Stat.
d(log(Z(-1)))/d(d(	3.75	7.92	**d(log(Z(-1)))**/d(d(	1.81	4.37
d(d(log(LP)))/d(d(	-0.65	50.29	**d(d(log(KP)))**/d(d(	0.43	4.55
Adjusted Sample: 1973-2014			Adjusted Sample: 1973-2014		

Data source: Models 21 and 22 were obtained from the GLS regressions conducted.
NB: Regressions 21 to 22 were free from autocorrelation and heteroscedasticity.

Discussion

There is evidence of long-term relationships in developed countries, usually unidirectional causal relationships from economic growth to innovation. This implies that innovation is simply a consequence of rapid economic growth.

This evidence indicates that a strong economy is appropriate for innovative activities. The relationship between innovation and economic growth emerged in recent years (Pradhan et al., 2016). In the case of Uganda, evidence shows that there is bidirectional causality between (a) innovation advancement and economic growth, (b) innovation advancement and higher education gross enrolment ratio (HGER), (c) technological progress and HGER growth, (d) economic growth and HGER growth, (e) growth in capital and HGER growth, (f) growth in labour, capital, capital productivity, labour productivity and HGER growth and (g) total factor growth and HGER growth within the given period, ceteris paribus.

Nowadays, this relationship has become a central and topical theme in research in innovation economics. Studies on the relationship between innovation and economic growth can be done under any of the four themes (Maradana et al., 2017) by assuming: (a) unidirectional causality from innovation activities to economic growth; (b) unidirectional causality from economic growth to innovation activities; (c) bidirectional causality between innovation activities and economic growth; and (d) no relationship between economic growth and innovation activities (Maradana et al., 2017; Pradhan et al., 2016). Theme (c) is appropriate for our study because the study rests on the causal principle that if event A occurs before event B, then event A must be the cause of B. As a result, all the dependent variables were regressed on the lags of the respective independent variables. We also examined the unidirectional causality running (i) from innovation advancement to individual growth in technology, capital to labour as well as (ii) from total productivity to economic growth, by regressing the dependent variables on the first lags of the independent variables.

The discussion focuses on the effects of higher school education on economic growth, innovation advancement and technological progress. According to the World Economic Forum (2016), education is defined as the stock of skills, competencies and other productivity-enhancing characteristics. In every country, education is an important part of human capital because it (a) increases the efficiency of each individual worker and (b) stimulates the economy to move up the value chain beyond manual

tasks (World Economic Forum, 2016). A lot of empirical works, including our empirical findings, have shown empirically that education affects productivity growth.

Generally, in every country, education affects productivity through three channels (World Economic Forum, 2016). One, it enhances the collective ability of the workforce to carry out existing tasks more quickly. Two, through secondary and especially tertiary education, it facilitates the transfer of knowledge about new information, products and technologies created by others (Barro & Lee, 2010). Lastly, education increases the creativity of each country and enhances the capacity of the country to create new knowledge, products and technologies (Grant, 2017). Education plays a leading role in enhancing economic growth, innovation advancement and technological progress. This finding is supported by Woessman (2014) and UNESCO (2012).

Woessman (2014) argues that education is a leading determinant of economic growth and employment. Meanwhile, UNESCO (2012) finds that for each US$1 spent on education, about USD10 to USD15 is generated as an outcome of economic growth (UNESCO, 2012). Moreover, if 46 of the poorest countries in the world could attain the lowest Organisation of Economic Cooperation and Development (OECD) benchmark for mathematics among 75% more 15-year-olds, economic growth could improve by 2.1% from its baseline and 104 million people could be lifted out of extreme poverty (UNESCO, 2012). Our finding is also supported by empirical evidence that Tilak (2003) provides by using data from 49 countries in the Asia Pacific region.

Tilak (2003) finds a significant effect of HE (gross enrolment ratio, GER) on the level of economic development (as measured by Gross Domestic Product [GDP] per capita). Tilak (2003) allows a time lag for HE to cause economic development. The rapid economic rise of India on the world economic stage is attributed partly to its long decades of successful efforts to provide high-quality, technically orientated HE to a significant number of its citizens (Bloom et al., 2006). Bloom et al. (2006) finds that expanding higher education (HE) may promote faster technological catch-up and improve a country's ability to maximise its economic output. Bloom et al. (2006) show, that the Sub-Saharan Africa production level in 2006 was about 23% below its production possibility frontier. A one-year increase in the HE stock could have increased the growth rate of GDP per capita by 0.24 percentage points and African output growth by an additional 0.39 percentage points in the first year. Thus, a one-year increase in HE stock could have boosted incomes by roughly 3% after 5 years and ultimately by 12 % (Grant, 2017).

Our empirical findings show that in Uganda during the 1973 to 2014 period, a 1% increase in higher education growth could have caused technological progress, innovation, total factor, income, capital, labour, labour productivity and capital productivity to rise by 0.27, 0.10, 0.56, 0.82, 1.56, 0.53, 0.55 and 0.28% per annum, respectively. This particular empirical finding indicates that higher school education growth could have been the most important factor in enhancing capital accumulation and a very important factor in boosting incomes in Uganda during the given period (see Tables 1 to 6, 21 and 22 above for more details).

Meanwhile, in Uganda during the given period, a 1% increase in growth of technology, innovation, total factor, income, capital and labour could have caused higher education growth to rise by 1.36, 5.02, 1.42, 1.08, 0.45 and 1.84% yearly, respectively. From this particular empirical finding, it can be discerned that innovation advancement had the highest potential to enhance higher school education, followed by the generation of employment (see Tables 7–12).

Moreover, in Uganda during the given period, a 1% increase in innovation advancement could have caused income, labour, capital, technology, labour productivity and capital productivity to rise

by 4.63, 3.14, 4.60, 1.97, 3.75 and 1.81% yearly, respectively. From this particular empirical finding, it can be observed that in the country, innovation advancement had spectacular potential of enhancing growth in income, labour, capital, technology, labour productivity and capital productivity (see Tables 14, 16, 17, 18, 21 and 22 for details). Lastly, from Tables 13 and 15, it can be observed that in the real economy, economic growth can be enhanced sufficiently, by technological progress and total factor productivity.

Policy Implications

Among the several national policies of higher education that the Government of Uganda is required to execute are four major strategies: (a) the promotion of research and strengthening regional universities; (b) improving college/university admission policy; (c) improvement of the overall college/university education system; and (d) constructing a sound vocational and technical education. Second, the Government of Uganda must focus on seven key technology areas: industrial technologies; emerging industrial technologies; knowledge-based service technologies; state-led technologies; national issues-related technologies; global issues-related technologies; and basic and convergent technologies. Third, research and development (R&D) investments as a share of GDP should be increased. Four, innovation advancement through economic growth, employment generation, capital accumulation, growth in higher school education, total factor growth and technological progress should be promoted. Five, innovation advancement should be used to enhance economic growth, employment generation, capital accumulation, growth in higher school education, total factor growth and technological progress. Six, economic growth, capital accumulation and economic growth should be promoted through innovation advancement. Seven, intellectual property rights should be promoted. Eight, innovation should be driven mainly through the private sector. Nine, the rapid-learning cycle in technology development should be improved. Ten, manufacturing capacity should be increased to grow an innovation-based economy. Last, a knowledge-based economy should be created.

Below is a summary of broader policy implications, regarding the role of higher school education in enhancing economic growth, innovation and technological progress in Uganda:

(1) Uganda will need to promote new drivers of economic growth to address its major technological advancement challenges. Sustained growth in the long run will depend on continuous technological progress. To promote continuous technological progress and cultivate new drivers of growth, Uganda could pursue policies to enhance the structural and institutional reforms that promote the removal of distortions, accelerate diffusion and foster discovery.

First, reducing distortions in the allocation of resources has been a key driver of growth in the past, and continuing reforms would allow Uganda to reach its maximum potential production frontier, and the removal of distortions requires reforms of financial, labour and land markets to ensure that resources are allocated competitively and efficiently to their most productive uses in the economy. Second, accelerating diffusion of more advanced existing technologies, products and management techniques will help Uganda extend its current production frontier to the global frontier. Accelerating diffusion requires innovation and science and technology policies that promote the diffusion of technology, as well as an upgrading education and training system that prepares workers to adopt and use new technologies. Third and last, fostering the discovery of new innovation and technology will help Uganda to extend its global production frontier.

(2) The Government of Uganda will continue supporting specific technologies and industries, particularly by targeting R&D. For instance, government will provide the national institutes of health with critical financing for key technologies that contribute to the growth of the biotechnology industry, and the internet. Government will also follow the industry policy strategy, such as improving the information and communications technology (ICT) infrastructure as well as intellectual property rights, and upgrading the workforce. These policies shall be complemented by the provision of support to key enabling technologies and industries such as the automotive and steel industries, including support through various funds, such as national industry promotion strategies, that can promote manufacturing upgrading by increasing the digitisation and interconnection of products, value chains and business models.

(3) Government aims at strengthening the innovation capacity of firms. Uganda has extensive innovation support policies that are in line with economic objectives (productivity, diversification, human capital, entrepreneurship and inclusion) and science, technology and innovation objectives (research excellence, technology transfer, and R&D and non-R&D innovation) that are commonly seen in other countries. The policies employ a wide range of instruments to support innovation, such as fiscal incentives, grants, loan guarantees, vouchers, equity, public procurement, technology extension services, incubators, accelerators, competitive grants and prizes, science and technology parks, collaboration and networks.

(4) Higher school education, in particular, is essential for promoting the removal of distortions, for accelerating diffusion and for fostering discovery. It facilitates the diffusion of innovation and technology by enhancing the capability of the workforce to use, adopt and disseminate technologies. A more capable workforce will assist in fostering new discoveries and innovations and strengthen the research capabilities of Uganda's universities, research institutes and enterprises.

Prioritising human capital investments and strengthening Uganda's education and training system will be essential for transitioning to innovation-led and productivity-led growth.

(5) Government regulatory authorities encourage commercial banks and other financial service providers to expand lending to small and medium enterprises. They encourage the implementation of differentiated monetary and credit policies, risk compensation funds, and government guarantee funds and tax incentives.

(6) International trade and investments can continue to be an important source of growth for Uganda. Uganda will continue to improve its international competitiveness and raise the quality and innovativeness of its exports. Thus, Uganda needs to continue to pursue policy and institutional reforms to open up its economy and integrate and engage in free trade. These actions would provide critical new drivers of growth for Uganda's economy by promoting market competition, access to global frontier technologies, collaboration with globally leading firms, and integration into and upgrading within global value chains (World Bank, 2019).

Conclusion

We find that a 1% increase in higher school education GER had the potential of causing economic growth, innovation advancement and technological progress to increase by 0.82, 0.10, and 0.27%, respectively, in Uganda during the given period. Meanwhile, empirical evidence shows that a 1% increase in economic growth, innovation advancement and technological progress had the potential of causing annual higher school education GER growth to increase by 1.08, 5.02 and 1.36%, respectively, during the given period. Government should promote research at universities and strengthen regional

universities, improve tertiary admission policy, improve the overall tertiary education system and construct a sound vocational and technical education.

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Relevant data was collected from the United Nations and World Bank websites.

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Appendix

Deriving Alani consumption function from national income accounting

Consumer behaviour in the national income accounting consists of aggregate disposable income (Y_{dt}), which is the addition of household consumption (C^*_{nt}), and the aggregate household investment I_t where the mental consumption (C^*_{nt}) function is given by $(C^*_{nt}) = C_{nt-1} - C_0$.

$$C_{nt} + I_t = Y_{dt}. \quad (12.1)$$

Substituting $(C^*_{nt}) = C_{nt-1} - C_0$ in Equation (A.1.1) where $(C^*_{nt}) = C_n + u_t$, provides

$$-C_0 + C_{nt-1} + I_t = Y_{dt}. \quad (12.2)$$

Equation 1 can be rewritten in terms of MPC (β) and marginal propensity to invest, MPI (α)

$$-C_0 + C_{nt-1} + I_t = \alpha Y_{dt} + = \beta Y_{dt}. \quad (12.3)$$

Since $\alpha + \beta = 1$ (12.4)

the MPC equals the APC, implying that $I_t = \alpha Y_{dt}$ making Equation (12.3) reduce to Equation (12.10) as follows:

$$\alpha Y_{dt} + \beta Y_{dt} = Y_{dt} \quad (12.5)$$

$$\left(\frac{I_t}{Y_{at}}\right)Y_{dt} + \left(\frac{C_{nt}}{Y_{dt}}\right)Y_{dt} = Y_{dt} \quad (12.6)$$

$$\alpha Y_{dt} = I_t \quad (12.7)$$

Rewriting Equation (12.3) by substituting I_t for αY_{dt} gives

$$-C_0 + C_{nt-1} + I_t = I_t + \beta Y_{dt} \quad (12.8)$$

Thus $$-C_0 + C_{nt-1} = \beta Y_{dt} \quad (12.9)$$

$\therefore$ $$C_{nt-1} = C_0 + \beta Y_{dt} \quad (12.10)$$

Preparing for robustness checks by using MPC derived from the neoclassical production function

The neoclassical production function for the households could be expressed by

$$Y_{dt} = I_t^{\alpha} C_{nt}^{\beta} \quad (12.11)$$

Where Y_{dt} is output, I_t is capital formation, quantity of labour is estimated by aggregate level of consumption C_{nt}, and α, β are parameters of returns to scale on capital and labour, respectively. Equation (12.11) can be rewritten as follows:

$$Y_{dt} = I_t^{\alpha} C_{nt}^{1-\alpha} = I_t^{\alpha} C_{nt} C_{nt}^{-\alpha} \quad (12.12)$$

Manipulation of Equation (12.12) provides the following:

$$\frac{Y_{dt}}{C_{nt}} = + \left(\frac{I_t}{C_{nt}}\right)^{\alpha}. \quad (12.13)$$

Transformation of Equation (12.13) in logarithm form gives

$$\therefore \quad \log \frac{Y_{dt}}{C_{nt}} = \alpha \log\left(\frac{I_t}{C_{nt}}\right) \quad (12.14)$$

$$\therefore \quad \log(10).\log\left(\frac{Y_{dt}}{C_{nt}}\right) = \alpha \log(10).\log\left(\frac{I_t}{C_{nt}}\right). \quad (12.15)$$

Rewriting Equation (12.15) in double log form provides

$$\log[\log\left(\frac{Y_{dt}}{C_{nt}}\right)] - [\log(10).] = -\alpha[\log(10)] + log\ [\log\left(\frac{I_t}{C_{nt}}\right). \quad (12.16)$$

Manipulation of Equation (12.16) yields a reduced form of Equation (6) as follows:

$$log\ [\log\left(\frac{Y_{dt}}{C_{nt}} \times \frac{C_{nt}}{I_t}\right)] = (1 - \alpha).\ log\ [\log(10)]. \quad (12.17)$$

$$\therefore \quad log\left(\frac{Y_{dt}}{I_t}\right) = \beta \log(10) \quad (12.18)$$

Table 12: Effect of a 1% increase in growth of an independent variable on the rise in growth of a given dependent variable in Uganda (1970 -2014): A summary

Dependent Variable (Effect)		Independent Variable (Cause)	
Technology	0.27%	Higher Education	1%
Innovation	0.10%	Higher Education	1%
Total Factor	0.56%	Higher Education	1%
Gross Domestic Product	0.82%	Higher Education	1%
Capital Stock	1.56%	Higher Education	1%
Quantity of Labour	0.53%	Higher Education	1%
Higher Education	1.36%	Technology	1%
Higher Education	5.02%	Innovation	1%
Higher Education	1.42%	Total Factor	1%
Higher Education	1.08%	Gross Domestic Product	1%
Higher Education	0.45%	Capital Stock	1%
Higher Education	1.84%	Quantity of Labour	1%
Gross Domestic Product	1.33%	Technology	1%
Gross Domestic Product	4.63%	Innovation	1%
Gross Domestic Product	1.14%	Total Factor	1%
Quantity of Labour	3.14%	Innovation	1%
Capital Stock	4.60%	Innovation	1%
Technology	1.97%	Innovation	1%

Dependent Variable (Effect)		Independent Variable (Cause)	
Labour Productivity	0.55%	Higher Education	1%
Capital Productivity	0.28%	Higher Education	1%
Labour Productivity	3.75%	Innovation	1%
Capital Productivity	1.81%	Innovation	1%

In Table 12 above we summarise the effects of growth in higher school education on economic growth, innovation advancement and technological progress in Uganda during the 1970–2014 period. Firstly, from the table it can be observed that the empirical findings show that a 1% increase in higher school education gross enrolment ration (GER) growth could have caused technological progress, innovation advancement, total factor growth, economic growth, capital accumulation and labour generation to increase annually by 0.27, 0.10, 0.56, 0.82, 1.56 and 0,53%, respectively, in Uganda during the given period. Secondly, empirical evidence shows that a 1% increase in technological progress, innovation advancement, total factor growth, economic growth, capital accumulation and labour generation could have propelled higher school education GER growth to increase yearly by 1.36, 5.02, 1.42, 1.08, 0.45 and 1.84 %, respectively, during the given period.

Thirdly, over the given period, a 1% rise in technical progress, innovation and total factor growth could have driven economic growth to increase by 1.33, 4.63, and 1.14 % annually, respectively. Fourthly, a 1% increase in innovation advancement could have generated a rise in growth of labour quantity, capital stock and technology by 3.14, 4.60 and 1.97% yearly, respectively. Fifthly, a 1% growth in higher school education GER could have produced a rise in growth of labour productivity and capital productivity by 0.55 and 0.28% annually, respectively. Lastly, a 1% increase in innovation advancement could have stimulated a rise in growth of labour productivity and capital productivity by 3.75 and 1.81% yearly, respectively.

Building Educational Research Capacity: Challenges and Opportunities from the Perspectives of Faculty Staff of Selected Private Universities in Uganda

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Abstract

This article argues that educational research in Uganda is facing severe glitches, such as low research capacity. Most private universities seem to be more focused on their day-to-day survival than identifying their research-specific needs and engaging in quality research activities. Issues of research capacity-building remain a major concern amid a lack of resources and institutional environments in which academics work. Capacity-building and research engagements would help to strengthen strategic planning and influencing policy. Hence, this study fills this gap. Specifically, it explores the perceptions and experiences of academic staff regarding research capacity-building. The study identifies the challenges that hamper educational research and capacity-building opportunities associated with the development of research capacities as perceived by a sample of staff members in the identified institutions. To achieve this objective, a qualitative research design was adopted using focus group interviews to collect data from a sample of staff. In total, 12 focus group discussions were conducted with between 8–10 persons per group. Rank ordering of responses on specific issues was done during data analysis. The findings showed that the major factors responsible for low research output include capacity-building gaps, lack of financial resources, difficulty in identifying specific calls for abstracts and manuscripts, work overload for faculty staff, limited research writing skills, and bad experiences during previous research engagements, as presented and discussed below. Based on the findings, we make the following recommendations. First, the government should earmark a significant amount in the national budget for research and innovation that institutions in Uganda can easily access, including private academic institutions. Second, institutions should continuously engage their staff regarding research and improve their research capacity through training, workshops and symposiums.

Keywords: *Educational research; Higher education; Private universities; Uganda*

Introduction

In recent years, the academic community has been debating the relevance and quality of research at higher education level and the need for tertiary institutions and researchers to develop a better knowledge base that can impact educational policies and practice significantly (Barrett et al., 2011; Cain & Allan, 2017; Gogolin, 2016). Researchers often debate what the goal of research is and whether or not it has any real-life implications. The fact of the matter is that the majority of studies carried out by researchers all over the world remain largely unseen and unread (Cain & Allan, 2017). This is even worse for researchers from Third-World countries who are competing to publish in top Western journals, but whose papers are more Afro-centric and localized, thereby making them not very sought after in the Western world. Therefore, the majority of papers, although published in these big, high-impact journals, still get very little or no readership or citation (Hallinger, 2020). Furthermore, educational research in the Global South is facing serious issues, such as limited research capacity and inconsistencies between research and educational policies, among others (Tikly & Barrett, 2013). This is particularly true in Uganda and the general East African region where the brain drain (a situation where highly qualified professionals migrate to the Global North in search of better opportunities) has all but decimated the academic sector. Also, lack of research funding from both the government and the corporate world negatively impacts research in Uganda and other East African countries. What this has translated into is that owing to a lack of proper funding and motivation for research, the quality of research output in Uganda has been questionable for a while (Atwebembeire et al. 2018).

While the issues related to research-building and -capacity have been studied in other contexts and other regions (Barrett et al., 2011; Crossley, 2001; Crossley & Holmes, 2001; Fowler et al., 2009; Harrison & Seddon, 2013; Leitch, 2009; Rees et al., 2007, Hammad & Al-Ani, 2021), very little have been done in the context of Uganda and with particular emphasis on private universities. Nanfosso (2011), in his work on capacity-building in Africa, argues that there is a need for rigorous and vigorous action aimed at improving the research capacity of quantitative and qualitative researchers on the continent and that there is a dearth of literature on the subject matter from a Sub-Saharan African perspective. A deep search on the most prominent indexing sites like the web of science, Scopus, ProQuest and so on, reveals that very little research has been done, hence the urgent need for more scientific studies that discuss how the research capacity in African higher institutions can be developed and improved. This study, therefore, seeks to fill this gap by identifying the challenges and opportunities regarding the development of research capacities as perceived and explained by select faculty members in four of the top private universities in Uganda: Ndejje University, Muteesa I Royal University, Kampala University, and Kampala International University.

Problems of Doing Research in Africa

Doing research in developing nations can be problematic because of the lack of relevant information and the reliability of studies that have already been published (Kinyondo & Pelizzo, 2018; Scott, Miller, & Lloyd, 2006). Another factor that has made the problem of capacity-building more apparent is the lack of quality data (Jerven, 2013). According to Mitchell (2000), validity checks of several studies in the area of medical sciences emerging from the African continent have shown a large number of discrepancies, an indication that the validity and reliability of a lot of studies in the Global South cannot be trusted. There are a lot of reasons why carrying out surveys or ethnographic studies may generate inconsistent data, one of which is the problem of sampling in developing countries

(Zarkovich, 2000). Zarkhovich explains that in a lot of cases, surveys are not randomly distributed but are rather distributed according to the social and cultural accessibility of the population being studied. Also, owing to the very dynamic population of African countries, meanings can drastically change from one location to another, implying that a question in a questionnaire might mean one thing in a particular location and something completely different in a different location but in the same country or study population (Mitchell, 2000). Some scholars have explained that the reason why it appears that data is not consistent across different studies is that data os not coded the same way (Smith, Langlois, & Rockett, 1995).

These problems can affect the quality of data collection by scientists in all fields of endeavour (Chen & Ravallion, 2008). Given the many things that could go wrong when carrying out research, some scholars have identified different solutions that can help to reduce or eliminate the problems. For instance, Mphatswe et al. (2012) have recommended that collaboration between sectors, disciplines and regions should be encouraged to ensure that scholars from less developed and less research-inclined climes are supported, which should improve the quality of research conducted in such regions. Islam and Kiyondo (2014), in their study, noted that in Tanzania, examining the elasticity of employment over a period of time can be problematic because the "data required for estimating employment elasticity and examining its change over time are rather limited… the employment figures available from Integrated Labour Force Survey (ILFS) of different years are not comparable". Also, the two surveys used have "different age cut-offs… while the 2001 survey used ten years and over as the age for being counted in the labour force, the 2006 survey used 15 years as the lower age limits."

Apart from the issue of coding (where data coding is not consistent across studies), quantitative data can also be problematic even when coding is consistent because data in a lot of African countries is not valid and reliable. The absence of good data has been well documented by Jerven (2013, 2015). Furthermore, lack of support from the government, even for government-owned statistical offices like the Ugandan Bureau of Statistics in Uganda, makes the reliability of data collected from these sources highly questionable. However, data collected from well-funded institutions can produce very reliable and valid data.

Building Research Capacity

Huenneke et al. (2017), in their study on strategies for improving the research capacity of university lecturers, explain that tertiary institutions all over the world are under a lot of pressure to meet a standard created by global ranking demands and globalisation. To try to fit in and be considered among the 'best' institutions in the world, universities around the world are putting a lot of pressure on faculties to develop groundbreaking research and publish in only the best journals in the world. To survive in this environment of cutthroat competition, institutions around the world have come to place a lot of emphasis on developing the capacity for research (Griffioen, 2018). Institutions have adopted different approaches to developing research capacities within their institutions, but all these approaches often involve the development of the right infrastructure to foster collaboration and research, recruitment of the best brains from all over the world to help shore up their research capacity, motivating staff by proving institutional grants and also tying promotions and increased remuneration to research output (Nguyen, 2016). Huenneke et al. (2017) further explain that institutions around the world are now investing in programmes that foster collaborations, affiliations and partnerships, which invariably leads to more research output.

In the academic sector, capacity-building has often been described and promoted as a means to address the shortcomings in research in higher education and to help researchers and faculties produce high-quality, valid knowledge that addressed particular needs in society and solves real-world problems (Barrett et al., 2011; Leitch, 2009). The need for capacity-building in Africa is even more urgent, considering the growing criticism of the quality and quantity of research output on the continent. For instance, Kinyondo and Pelizzo (2018) explain that one of the major problems of conducting research in Africa is that data is very poor, does not exist or is lacking in terms of reliability and validity. They explain that there is a lack of research culture on the continent and that this has translated into very poor research outcomes on the continent. Similarly, Michell et al. (2020) argue that the research output on the continent is chronically lacking due to a lack of research capacity, but also point out that studies in Africa fail to address local needs because they all aim to be Northern-centric, implying that a lot of researchers in Africa focus on producing studies that will appeal to the Global North while ignoring the issues that they are grappling with on the continent. The reason for this is not farfetched. Since the majority of the funding for research comes from the Global North, researchers are increasingly going to focus on studies and issues that will attract the most funding. So, based on the criticisms calling out the low-quality research output and the amount of research output on the continent, there is a need for a review of the challenges being faced by academics in the continent and sub-region when it comes to developing high-quality research.

A lot has been said about improving the research capacity in universities and among researchers, but there is no agreement or consensus on exactly what is meant by research capacity-building (Hammad & Al-Ani, 2021). Different authors view it as a process that aims to develop research skills and equip researchers with sound methodologies and tools to enable them to carry out high-quality studies (Barrett et al., 2011; Rees et al., 2007; Ridley, 2011). Leaitch (2009), while attempting to understand what research capacity-building is, explains that research capacity-building is all about ensuring that there are active researchers with the right skills and knowledge to produce high-quality research. Munn (2008), on the other hand, argues that capacity-building in research goes beyond just acquiring the skills, but includes a comprehensive understanding of the entire research process and the development of applicable knowledge to apply this knowledge. Rees et al. (2007) and Ridley (2011) explain that research capacity-building primarily aims at developing the skills of researchers in the area of research methodologies and that researchers need training that addresses how to conduct empirical studies, how to use the data collected and the different analysis methods for qualitative and quantitative approaches, how to design different research instruments and, finally, how to handle large-scale datasets.

Other studies have also pointed to the fact that there are different informal as well as formal strategies that have been adopted by governments and institutions all over the world to address the issue of capacity-building in educational research. These strategies include critically reflecting on the professional experiences of other research scholars, interactions with more established scholars and engagement in research as a professional activity (Munn, 2008; Rees, et al., 2007). Barrett et al. (2011), Christie and Menter (2009) and Jacob and Meek (2013) recommend that a collaborative approach to building the research capacity of faculty members in tertiary institutions should be adopted. This collaboration should be adopted between researchers and other stakeholders during the entire research process. Asare et al. (2020) suggest collaboration between the Global North and South where European and Western-based researchers collaborate with researchers from developing

nations of Africa to carry out research that addresses the need of both societies while borrowing from the experiences of one another.

In the UK, the US and other developed Western nations, different programmes have been developed to help address the issue of educational research capacity. For instance, in the United Kingdom, three capacity-building initiatives were identified and they are: the Applied Educational Research Scheme (AERS), which is tasked with fostering collaborations across seven universities in Scotland; the Teaching and Learning Research Programme (TLRP), whose main task is to support educational research across the entire United Kingdom; and the Welsh Education Research Network (WERN), which focuses on building a network of all universities in Wales. On the African continent, there has been an attempt to improve collaboration. For example, the East African Consortium for Clinical Research is a capacity-building network of universities from six different countries in East Africa, eight partner institutions from the Global North and five countries in the Global North and funded by the European and Developing Countries Clinical Trials Partnership (EDCTP), also found on the African Economic Research Consortium, the Consortium for Advanced Research Training in Africa(CARTA), among others. However, the question remains whether or not their strategic objective of improving research in Africa is being achieved.

Based on the foregoing, the researchers, therefore, sought to answer the following research question:

What are the challenges affecting research output in educational research institutions in Uganda?

Methodology

Research approach

Considering the exploratory nature of this study, the researchers opted to make use of a qualitative research design to achieve the study objectives. Since this study focuses on exploring the perception of university lecturers in Uganda regarding the issue of educational research in the country, it was determined that a qualitative approach would be the most appropriate. According to Creswell and Poth (2017), qualitative research is appropriate when a study seeks to explore people's lived experiences since it focuses on getting the unique perspective of particular individuals that can shed light on and provide invaluable contributions to the subject being discussed. Focus group discussions (FGDs) and in-depth interviews were used to collect pertinent data. These two approaches were combined in order to conclusively answer the "why" in this study.

Study participants

Since this study focused on the challenges faced in education research in universities in Uganda, the researchers opted to organise FGDs and interview key stakeholders in each of the schools studied. The criteria for selecting those that participated in the FGDs were as follows: first, the individual must be a lecturer with at least a doctorate working in either Kampala International University, Muteesa I Royal University, Kampala University or Ndejje University; second, the individual must have published at least three peer-reviewed articles in the previous three years. The criterion for selecting those that were interviewed was that they must be part of the top administrative staff in any of the colleges, faculties, institutes or schools in either of the universities being studied. The reason for focusing on top administrative staff (like deans, research deans or principals) is that they would be in a better position to highlight some of the challenges faced from a management and administrative perspective.

In total, 12 FGDs were organised per institution, and the breakdown is as follows:

Table 1: Breakdown of focus group discussion participants

	No. of participants	Participant characteristics	Venue	Date
Groups 1, 2 & 3	30 (10 per group)	Senior lecturers in humanities and social sciences, and administrative staff	Kampala International University	23rd August 2022
Groups 4, 5 & 6	30 (10 per group)		Kampala University	23rd August 2022
Groups 7, 8 & 9	27 (9 per group)		Ndejje University	15th August 2022
Groups 10, 11 & 12	24 (8 per group)		Muteesa 1 Royal University	15th August 2022
Total	**111**			

Furthermore, five research deans or research coordinators were interviewed at Kampala International University, three research coordinators from Kampala University, and two top administrative staff at Ndejje University and one from Muteesa I Royal University were also interviewed. It was observed that at this point, saturation had been achieved and there was no need to interview more people.

Data collection instruments

Two instruments were developed to help collect data, and they are the discussion prompts and interview guides. The FGDs were organised in such a way that participants were allowed to express themselves unhindered and the researcher simply noted the key points. The discussion prompts were used to ensure that the discussions were organised and addressed the issues being discussed and provided answers to the research question. The interview guides, on the other hand, included the major questions that the researchers needed answers for.

Criteriology

There is a lot of debate about the reliability of qualitative data. However, what is clear in this debate is that researchers must ensure the validity and reliability of the conclusions arrived at irrespective of their methodological approach (Creswell, 2014). To ensure that the conclusions arrived at in this study are valid and reliable, the researchers made use of triangulation. Lincoln and Guba (1985) recommend the use of triangulation because it helps in removing innate bias and improves the credibility of the research findings. It is, therefore, on the basis of this premise that the researchers opted to make use of both FGDs and in-depth interviews as a way to ensure a rigorous approach to data collection. Creswell (2014) explains that to improve trustworthiness, a second opinion or corroborative evidence must be provided. By making use of both FGDs and in-depth interviews, the researchers have ensured that corroborative evidence is provided. Therefore the trustworthiness of the data and conclusions is ensured.

Furthermore, to increase dependability (also referred to as reliability in quantitative studies), the researchers provided an audit trail. This involves providing a comprehensive description of the entire process of data collection that allows other researchers to be able to replicate this study easily.

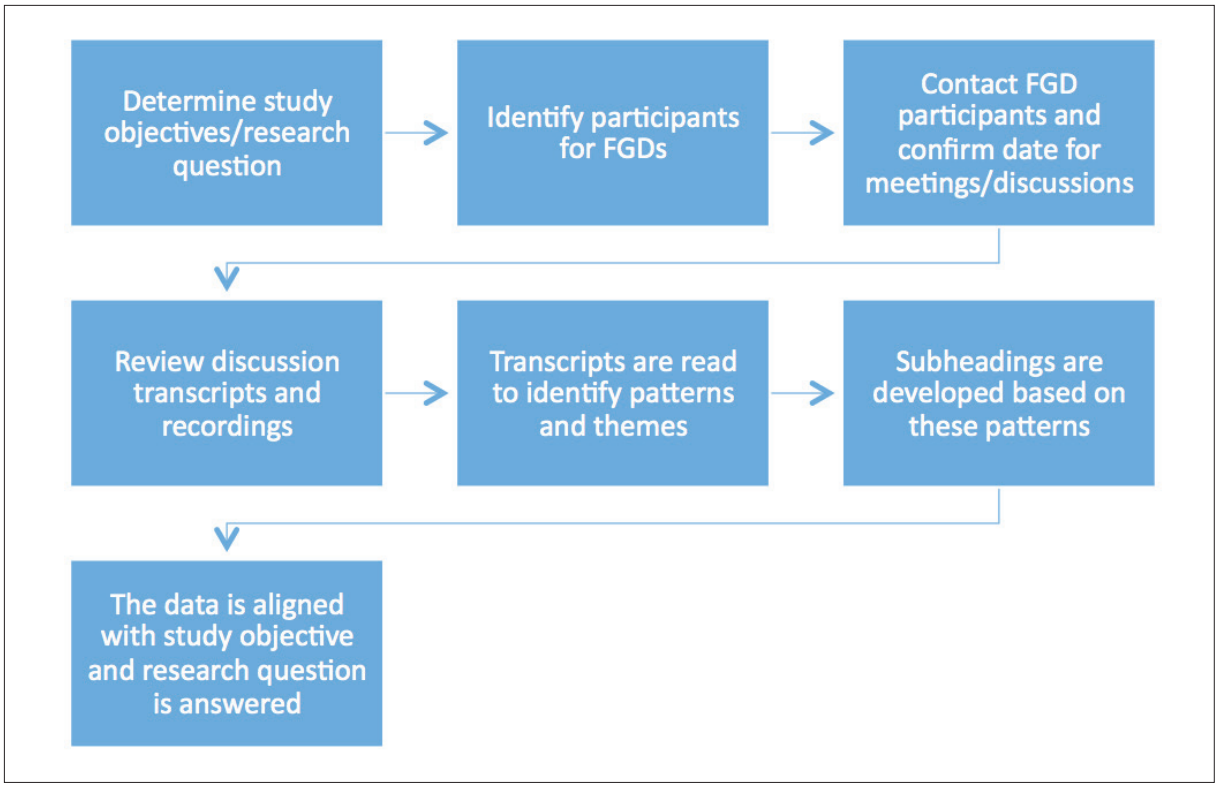
Finally, to increase conformability, which is also referred to as objectivity, the researchers removed or minimised bias by comparing the data with that from other similar studies and also consulting different extant literature on the subject matter, so various viewpoints on the subject matter are included in the current study.

Procedure

The participants were purposively selected and all ethical concerns were addressed. All the participants were given ample notice about the day of the interviews, as well as the time and venue. They also signed an agreement confirming that they understood the study and volunteered to give information. The researchers further assured all the participants of their confidentiality and that their names and positions would not be disclosed in any way or form during the writing of this paper. Finally, the participants were informed that they had the right to withdraw their consent at any time and stop participating in the study without needing to provide any justification or reason. These measures ensured that the participants were at ease and willingly participated in the study.

The diagram below describes the entire process of the FGDs and analysis.

Figure 1: Research methodology process (authors, 2022)



Findings and Discussion

The findings are presented with a focus on the fact that academics are expected to engage in research as part of their role. This section presents the challenges besetting educational research in selected academic institutions in Uganda from the perspectives of academic and administrative staff. The factors responsible include capacity-building gaps, including lack of financial resources, difficulty in identifying specific calls for abstracts and manuscripts, multiple roles played, limited research writing skills, and nasty experiences during previous research engagements. These are presented and discussed below.

Research capacity

The findings reveal that for most institutions, the best they can do, in terms of research, is to develop research policies and appoint specific research coordinators to oversee research at the departmental

and college levels. Most of the institutions under this study encourage staff to write and publish for their career growth and the good of the institution. The research offices are not well-facilitated to run research activities. In some academic institutions, there is completely no budget allocated specifically for research while those that have some little funding earmarked have not put it to use. This hinders not only the dissemination of research findings but also makes it impossible for inter-university research collaborations to happen, as explained by many of the study participants. This finding is affirmed by some scholars, who argue that financial constraints impact virtually every aspect of research, including its mission, the procedures, the integrity of participants and the publication of findings (Njuguni & Itegi, 2013).

The participants affirmed:

> Sometimes, the research department is there by name but does not fully function beyond just having an appointed research coordinator. It is just a normal department since it is a requirement by NICHE for each university but not effectively functioning due to a lack of relevant resources.[4]

Furthermore, it was found that some academic staff do not commit to research because of the lengthy process involved in the production of an article. For many of them, this requires a lot of patience. This discourages many from continuing to write for publication. This is an indicator of low research capacity among staff.

In one of the focus group interviews (FGIs), the participants attested:

> Together with two colleagues, we wrote a manuscript during the first COVID-19 lockdown. We received feedback several times and attended to the comments and resubmitted. Up to today, we are almost ending the third year and the article has not been published. Despite several times making follow-up, we have been told to be patient. However, this is too much because we do not even have the motivation to write another manuscript when we have not even seen the first one being published. For me, I think that writing and publishing are for the brave and most patient staff. Some of us are already discouraged but we are very much committed to teaching and will continue to do a good job.[5]

This finding was common in all universities. Some scholars affirm that publishing in academic journals is often a sluggish and frustrating experience (Njuguna & Itegi, 2013; United States University, 2005). One ought to understand that certain types of research get published quickly as compared to others and that research submitted to the top journals may take much longer than expected, given the stringent processes involved.

This finding also seems to suggest that some academic staff detach research from teaching and learning. It is worth noting that the two are inseparable and must be done hand in hand for one to enjoy multiple benefits both at the individual and institutional levels.

It was established that in some academic institutions when teaching research methodology, lecturers quickly introduce students to the process of identifying and stating the problem and then teach about the methodology. Critical aspects, such as how to develop research tools like interview guides, questionnaires, sampling and data analysis, seem to be given a lower priority. This sometimes results in poor quality research which is not methodically sound. Thus academic staff are not comfortable publishing with students, especially as supervisors who fail to support the students further in the process of research, given the time constraint and lack of motivation. This supports the findings by Griffioen (2018), Nguyen (2016) and Huenneke et al.(2017), who all suggest that if

4 FGI 2 participants
5 FGI 4 participants

research output and capacity are to be improved, then the way students and scholars are introduced to the world of research is important. They explain that the process of teaching research methodology is important in ensuring a high level of research output. These scholars generally blame the low level of research output in an academic institution on the lack of capacity-building and encouragement in these citadels of higher learning.

The findings also conceal that tension arises when trying to balance institutional and individual priorities as well as making decisions about research and the different work priorities that comprise the demands of research, teaching and administrative roles.[6] This is so because research is a labour-intensive and skill-oriented undertaking as it entails identifying and tracing sources of information, reading numerous documents, developing research tools, sampling study participants, collecting data, and analysing and interpreting data. Although this capacity can be gained through experience, a person with multiple roles to play in an academic institution finds it very difficult to manage.

Another finding reveals that some study participants did not have easy access to calls for abstracts or manuscripts unless friends share on the different forums. One participant attested thus:

> It is by chance that some of us are able to see calls for abstracts or articles and sometimes when we see them, you can find that the deadline is too soon. It becomes hard to concentrate to write in such a short time amid the many other responsibilities. So, at times, we have to let go yet it is a rare opportunity to see a call. Moreover for some calls, as one reads the guidelines, you find that you are required to pay, for instance USD 50. With our meagre resources where we are not even paid on time, it becomes hard to contribute that money. This discourages some of us from putting efforts in writing articles for publication yet it is also very rare to find a call for submission where there is no fee attached.

In a similar vein, some participants asserted:

> In one of our research networks, we accessed a call for abstracts which we followed and submitted before the deadline. We were happy when we received communication on acceptance of our abstract and went further to develop the manuscript and submitted it. It took two years for it to be published. Moreover we realised that it was not in an authentic journal because it was sent to us in a PDF format document with two other articles claiming that this was the publication. We tried to see if we could find it on Google Scholar and there was nothing. This was the most discouraging. Up to today, none of us has written again. We have asked the journal editor to pull down our article so we can get get published in an authentic journal but the response we have got is that they are working on processes, one day it will appear on Google Scholar. It is very painful spending time writing with no return.[7]

The above finding reveals that staff lack the knowledge and skills of identifying credible journals, which would be one of the first steps before putting one's effort into writing. Possibly, in this case, there was trust in the source of information about the journal. Academic institutions ought to empower their staff further regarding prerequisites for writing to publish to avoid loss of time and morale in connection with academic writing for publication.

Also, studies by Barrett et al. (2011), Leitch (2009) and Kinyondo and Pelizzo (2018) all point to the fact that Africa is data-poor and that there is a lack of research culture among African academics. They go on to suggest that for research to improve on the continent, there is a dire need for institutions to build up the capacity of the staff and to ensure that these individuals have access to good and reliable data and funding.

6 FGI1 participants
7 FG 10 participants

Social factors

The findings also reveal that some academic staff had suffered trauma in their days as students. They had experienced brutality from their academic supervisors. For instance, some of the study participants narrated how they took between four and five years to complete their master's degrees and between seven and 10 years to complete a PhD. Hence, by the time they completed their studies, they felt enough was enough and that all they needed now was to concentrate on teaching and enjoy what they had missed while pursuing their higher degree courses.

In one of the FGIs, a participant narrated:

> As an older student, one time I was told by my supervisor that he was not responsible for my coming to school late and I should not rush him into giving me comments on my work. On several occasions, I was accused of being disrespectful and rude. The meeting held before my defence brought up strange reasons why I should not defend successfully and that I am rushing my supervisor into defence. My supervisor nearly disowned me during the defence but had signed on to my work. He claimed that he had told me to make certain corrections and I refused, which was annoying for me. I felt it was a betrayal of the highest order. So, after my studies, I felt I needed a break before I resume the research agenda. It is now two years and I am trying to recover from this experience. I hope to engage in academic writing possibly in the next year.[8]

Although it is not clear on what grounds such cases occur, one can conclude that certain factors are responsible. Some academic supervisors engage in segregation based on the politics of gender, ethnicity, race, religion, class and even gerontocracy (age). Some male lecturers cannot stand female students, and some female lecturers cannot stand male students. Some female lecturers cannot stand female students and vice versa. These are individual complexities that seem to contribute to one's future interest in research or the lack thereof. Some lecturers may find more comfort in people who share their religion or denomination, which should not be the case. There are also cases where lecturers prefer to deal with wealthier students than those perceived to come from poor backgrounds. Some lecturers discriminate against their students on account of age. Others may discriminate against students who are too young or too old. The young are regarded as not serious while the old are avoided because it is believed it is 'hard' to get them to follow instructions or adhere to timelines owing to the other responsibilities they have to discharge as employees, fathers or wives, or brothers and sisters. Irrespective of the causal factors, we need to note that when one encounters a nasty experience in their academic career such as the above, it implants in them a culture of resentment and loss of morale to engage in similar activities, in this case academic research.

The findings of this study support those by Barrett et al. (2011), Christie and Menter (2009) and Jacob and Meek (2013), who recommend that a collaborative approach to building the research capacity of faculty members in tertiary institutions should be adopted. They emphasise the need for academics to come together and collaborate on research activities irrespective of race, gender or background. They explain that it is the only way to build a cohesive and highly productive research environment and culture in academic research institutions.

In addition, it can be argued that the impact of research depends highly on the attitude with which the exercise is approached. Academic institutions that have handled their clients well have been able to have good products that continue to shine wherever they are and build a better research agenda. For the more laid-back institutions, students find it very easy to manoeuvre the system even

8 FG 9 participants

when research is part of their agenda but not given high priority. So, one's choice of a university to study at matters a lot.

> We know universities here where those who have money to pay to study have got there for the sake of attaining a given title but they come out when they do not have what it takes to get the title. Others hire people to do research for them because they have money. Luckily, they defend their research work and are awarded a degree and this has become a fashion. Anyone can pass research because money matters![9]

This finding portrays the lack of seriousness about academic research supervision. Some supervisors are not motivated by their institutions to supervise research. After allocating the names of students to lecturers for research supervision, no one seems to take the trouble to supervise the process. This compromises the quality of research and the output does not aid in solving community development challenges.

Furthermore, the findings reveal that mental laziness and fatigue are evident among some academic staff. Such academic staff do not like to work. They do not concentrate on writing nor do they want to be assigned students to supervise. They try to avoid being assigned students to supervise, and when they still get such students, they treat them badly. The students do not receive feedback on time and when they do, the comments are not insightful and useful in improving the quality of their work. They do not pick up students' calls and do not respond to email messages and notes left in their offices, leaving students very frustrated. If the students drop them, they become vengeful so that if the students complete their research work and the lecturers are appointed as internal examiners, they fail such students. It is thus evident that some academic staff do not take research and publication seriously. Otherwise, they would actively engage in supervising students with the hope of producing good quality work and having it published in authentic and credible academic journals. This finding partly explains why most of the research work done by students in academic institutions has ended up being shelved instead of being put to good use. One can also conclude that such academic staff are not aware of the value that research and publication add not only to their academic progress but also to the academic institution where they teach. Furthermore, research and publishing depend on good planning and effective academic supervision, which seem to be lacking in many of our universities.

In another FGI, the participants asserted:

> Some of our fellow lecturers fear competition and will not share with anyone the relevant academic calls. Evidence of this is seen in the manner in which they delay feedback if one happens to consult them for guidance. A manuscript that would take one month to complete takes three months and if one is not careful, the deadline passes because of delayed feedback. Thus some of our fellow lecturers have almost begun to manage the speed with which one should progress in terms of academic research and publishing. This can rile. Sometimes one can misplace the hard copy of the draft work you shared for them to read yet they insist on hard copies instead of soft or digital or electronic copies, thereby wasting valuable time and delaying progress. They will shamelessly ask for another copy. Thus teamwork is not exhibited in promoting research and publication. This needs to end and we work as teams.[10]

The findings also reveal that some of the staff just do not know how to start engaging in writing to publish. The process involved is not clear at all yet they also lack role models in institutions of higher learning. Those who would be role models do not publish, even after completing their PhD. Even 15

9 FG1 8 participants
10 FG 2 Participants

years after having completed their graduate studies, some of them have just one or two publications to their name. When one Googles their name, it does not shows up. This neither encourages others to write nor motivates them to inject their meagre resources into further studies because there is not much to motivate them. Some of the staff do not have time to supervise students.

In addition, a look at the take-home salary of graduates who have struggled to publish is quite demotivating. Some such graduates do not even secure reasonable jobs. Some PhD graduates end up teaching in public secondary schools where publishing is not a requirement, while their work in private universities is simply aimed at obtaining additional income. Lack of proper remuneration also came up in a lot of extant literature. For instance, Asare et al. (2020) suggest that there is a need for the Global South to collaborate with the Global North if research is to be improved. They premised their conclusion on the fact that researchers from the Global South are poorly renumerated and have very limited access to much-needed resources. They, therefore, suggested that for researchers to remain competitive, there is a need for them to collaborate with researchers from Europe and America who have significant access to funding and are increasingly more interested in carrying out research on the African continent.

Similarly, some people graduate with a or bachelor's degree or master's degree after doing research in teams/groups. This does not necessarily imply that an individual concentrated on research since a similar mark was awarded to each of the group members. In some institutions, students pursuing particular courses engage in school practice or internships and this is viewed as sufficient. The students are not requred to undertake research. When the need arises to pursue a graduate-level programme, such individuals are forced to give an inducement to complete their studies and graduate.

Some participants stated:

> When you want such a person to guide you to write your concept paper or PhD, they can't help much and cannot support you enough because they are not sure of what exactly is required.[11]

Furthermore, the findings reveal that some academic institutions normally experience poor internet connectivity even if computers are available. The bandwidth is sometimes too low to sustain any internet activity. This is so because the institutions may not have enough resources to cater for the required bandwidth. It thus becomes hard to download the latest books to aid the literature review process. There is also sometimes not enough money for institutions to subscribe to online resources/e-libraries. This was found to be a demotivating factor for some academic staff who would otherwise actively engage in academic writing.

Conclusion

The study participants pointed out the challenges and threats that make it difficult for them to engage in academic research and publishing as expected by their academic institutions. The challenges facing academic researchers in Uganda are not only academic but also involve the limited financial resources committed to capacity-building, and include social and individual factors. Furthermore, there are not enough motivational and pull factors for the staff. Not all academic staff seem to be interested in research and publishing, as reflected in the findings. However, it is the role of an academic institution to not only interest their staff in writing for publication but also to motivate those that successfully engage in this activity. This might turn out to be an inspiration for the majority to participate in academic writing, research and publishing. A research-based environment will be

11 FGI 10 participants

more highly valued by academic stakeholders. Moreover, learning, teaching and research are all interlinked.

Recommendations

- Specific reasonable budget allocations should be earmarked for academic research in all institutions or else the persistent poor remuneration of staff will continue to negatively impact the quality of research in our academic institutions in terms of skills, facilities and the general research environment. Implementation of the budgets must be strictly followed to make the research process easier and ensure the dissemination of research findings. The budget line should also cater for activities related to partnerships between private institutions, and private and public academic institutions, as well as collaboration, which needs to be strongly encouraged to meet the needs of a larger proportion of teaching staff. In this way, our academic institutions will be able to advance and create new knowledge that will be vital in supporting communities in terms of social and economic development.
- Institutions should ensure that all members of the academic community constantly engage in research and are provided with appropriate training, besides being encouraged to work in teams, so that they can achieve their research agenda. Training should be made available in the art of writing and getting published even if it means repeating the training two or more times before the beneficiaries feel confident enough to write manuscripts. In doing so, academic institutions will be on the right path to making academic writing and publishing an enjoyable learning experience in our universities.
- Heads of departments and research coordinators need to create an inventory where a student who drops a supervisor in favour of another should never be allowed to get his or her work back in the hands of the lazy supervisor. This is because the latter will tend to engage in fault-finding and to be grumpy and uncooperative, which will have future implications for the career goals of the victim yet the victim's effort would make a meaningful contribution to research.

Study Limitations and Recommendations for Future Studies

This study sought to find out the challenges faced by educational research institutions in Uganda in providing cutting-edge research. Owing to time and other constraints, the researchers could not explore some areas that would have further enriched this study.

First, the current study primarily focused on private institutions in Uganda while excluding comments from public institutions, which have substantially more research funding but are not necessarily publishing optimally or innovating, as would have been expected. Given this situation, the researchers recommend that other stakeholders in the education sector, including public institutions, research institutes and the National Council for Higher Education (NCHE), should be included, so that a more holistic view of the subject matter can be achieved.

Second, owing to a dearth of documentary evidence and time constraints, which made it difficult for the researchers to access all available records on research output, patent submissions and approvals, as well as grant proposal submissions and approvals, the current study has not exhaustively looked into which institutions are doing well and which are not doing well in terms of research. Because of this, a comparative study looking into the differing research output of different institutions in Uganda should be considered. As it is, the current study has simply focused on finding out the challenges being faced by various educational research institutes and did not attempt to compare them.

Finally, the current study made use of a qualitative research design which, in itself, is fine and capable of providing great results. The researchers, however, recommend that future studies consider using a mixed methods approach that makes use of a survey, so a larger sample size can be considered. This will help lend further credence to the results and conclusions of the current study.

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Research Management and Research Productivity among Lecturers at Kyambogo University, Uganda

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Abstract

Management is a critical factor for the performance of every organisation. Research management has thus become highly professionalised, with universities instituting systems, practices and structures to manage their research function. Universities also appoint high-level academic and administrative staff to coordinate, oversee and promote research activities to meet their research objectives. However, most universities in Uganda, Kyambogo, inclusive have not instituted functional research management. They still lack well-managed formal research teams, collaborations and partnerships, besides effective research training programmes, research monitoring, research ethical committees, journals and university press. This mixed-method study was, therefore, intended to investigate the effect of research management on research productivity at Kyambogo University. The study used self-administered questionnaires to collect quantitative data from 127 PhD-holding lecturers and interviews with seven key informers. The study applied structural equation modelling to analyse quantitative data and content thematic analysis for qualitative data. The results revealed weak research management in the university, and a positive and significant effect of research management on research productivity, with a Beta value of .402 and a P value of .000. The results imply that the near-absence of research management systems, practices and structures prevents lecturers from conducting research. The study thus recommended the institution of supportive research management systems, practices and structures in the university for increased research output among their academic staff.

Keywords: *Management; Research productivity; Lecturers*

Introduction

Management is a critical factor for the performance of every organisation. In the same vein, research management is a critical support factor for enhancing university research productivity. Research management has thus become highly professionalised, with universities instituting systems, practices

and structures to manage their research function, besides appointing high-level academic and administrative staff to coordinate, oversee and promote research activities to meet their research objectives (Beerkens, 2013). However, most universities in Uganda, Kyambogo inclusive, have not instituted functional research management. They still lack well-managed formal research teams, collaborations and partnerships, besides instituting effective research training programmes and research management units (Cloete, Maassen & Bailey, 2015; Kasozi, 2017). Many Ugandan public universities, Kyambogo inclusive, were transformed from teaching institutions, with research only being emphasised as a teaching component. Similarly, most of the academic staff they inherited had been basically trained as teachers and instructors but not researchers. Consequently, the research function of Ugandan universities, with Kyambogo being no exception, remains weak, with low research output among their academic staff (Cloete et al., 2015; Kasozi, 2017, 2019; Kyaligonza, 2015; Rukanyangira & Oidu, 2021). Research management in this study refers to hiring of research assistants to support lecturers' research activities, instituting formal research teams, establishing formal research partnerships and collaborations, allocating workloads that leave lecturers with enough time for research and instituting research management units like research grants offices, research monitoring offices, research ethical boards, university journals and a university press

Objectives, hypothesis and questions

The objective of this study was to investigate the effect of research management on lecturers' research productivity in Kyambogo University. The study was guided by a hypothesis, i.e. there is a statistically significant effect of research management on lecturers' research productivity in Kyambogo University. The study also sought to answer two research questions, namely: What is the level of research management support provided to lecturers in Kyambogo University? What is the level of research productivity among lecturers in Kyambogo University?

Literature Review

Research management and research productivity

While there is growing understanding of the broad trends in research management methods, there is still a shortage of empirical data demonstrating how these strategies affect research success in a Ugandan university context. Some studies (Iryna, 2018; Schubert, 2009) have revealed a positive impact of research management mechanisms, operational flexibility, target agreements, and an internal evaluation system for research output in the British and German universities. Other studies (Beerkens, 2013; Matovu, 2019) have reported that intensifying research management increases research productivity in universities. Regarding research barriers, studies (Feyera, Atelaw, Hassem et al., 2019; Okendo, 2018; Pulford, Crossman, Begg et al., 2020) have revealed that poor research management support systems were key research constraints in Sub-Saharan African universities. Similarly, Ramjaewon and Rowley (2020) report that the presence of research management structures like research management offices, research grants support offices, and research chairs and centres was a major enabler of research productivity in South African universities, while their absence in Mauritius was a critical research and innovations barrier.

However, some studies (Spapawawisit, Chandrachai, & Thawesaengskulthai, 2018) found research management to be the least critical factor for university research and innovation in Thai public universities, while others (Fullwood, Rowley, & Delbridge, 2013) did not find management to be critical to university research in the UK. It is also worth noting that the majority of the cited

studies were conducted in countries with well-established research management systems like the UK, Germany, Australia andSouth Africa (Iryna, 2018; Beerkens, 2013; Fullwood et al., 2013; Ranjeawon & Rowley, 2020). Other studies were conducted in private universities (Matovu, 2019; Okendo, 2018), hence the identification of contextual gaps in relation to a country with weak and developing university education sectors in Sub-Saharan Africa, Uganda inclusive. Conceptually, some studies approached research management from diverse angles, such as research quality assurance performance indicators (Matovu, 2019), research management support services and capacity (Pullford et al., 2020), research management structures (Ramjeawon & Rowley, 2020), while none of them concentrated on the identification of research activity areas and research training and monitoring of individual academics' research productivity, which were central to research management in the study.

One of the core research support management practices is the provision of research assistants to academic staff. These are sometimes hired from among graduate students as a component of their research training. Mody et al. (2018) and Nafukho et al. (2019) found that making research assistants available to faculty members in the US and Kenyan institutions, respectively, positively impacted on their annual publication counts. Similar earlier findings (Kyvik & Aksnes, 2015; McGill & Settle, 2012; Vabo, Alvsvag, Kyvik, & Reymert, 2016) all affirmed the close corroboration between post-graduate students as research assistants for academic staff to increase the academics' research productivity in the US, Iranian and Norwegian universities. Similarly, time is one of the most pertinent resources for academic staff and it is the first input in both the teaching and research processes. The scarcity model (Hattie & Marsh, 1996) affirms that research and teaching are competing activities and are thus detrimental to each other since they vie for time, energy and commitment, where more time spent on teaching implies less time left over for research and vice versa (Leišytė, 2016).This assumption was also confirmed by several studies (Albert et al., 2016abut family responsibilities do not explain this gender gap. The type of contract and tenure or rank do not seem to have any influence on productivity. Researchers seeking professional promotion rather than altruism or personal satisfaction are more productive and young scholars publish more than their older counterparts. Additionally, we find a certain research-teaching trade-off and some nuances in the predictors of publication productivity across birth cohorts and fields of study. Finally, international cooperation is one of the most relevant determinants of the number of publications, regardless of the birth cohort. The institutional context in the Spanish research system as regards requirements for promotion and the assessment of research outcomes may contribute to the understanding and interpretation of our results.","author":[{"dropping-particle":"","family":" Albert","given":"Cecilia","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Davia","given":"María A.","non-dropping-particle":"","parse-names":false ,"suffix":""},{"dropping-particle":"","family":"Legazpe","given":"Nuria","non-dropping-particle-":"","parse-names":false,"suffix":""}],"container-title":"European Journal of Education","id":"ITEM-1","issue":"4","issued":{"date-parts":[["2016"]]},"page":"535-549","title":"Determinants of Research Productivity in Spanish Academia","type":"article-journal","volume":"51"},"uris":["http://www.mendeley.com/documents/?uuid=974a30c0-17a1-4de0-88fc-be9df282866f"]}],"mendeley":{"formattedCitation":"(Albert et al., 2016a; Alhija & Majdob, 2017; Hadre, Beesley, & Pace, 2018; Henry et al., 2020; Janib, Rasdi, Omar et al., 2021; Khalil & Khalil, 2019; Nguyen et al., 2016; Okendo, 2018; Putri & Sofyandi, 2019; Salman, Kausar, & Furqan, 2018; Starovoytova, 2017b; Zhang, Clayton, & Breznitz, 2019) who, without exception, indicated a negative relationship between time spent on teaching and lecturers' research output.

However, the conventional wisdom model (Hattie & Marsh, 1996) contends that research and teaching are complementary, intertwined and mutually beneficial activities where each informs the other (Hattie & Marsh, 1996; Smeby, 1998). This school of thought was supported by Johnson (2013), who found that teaching and research are intricately linked and interdependent. Other scholars (Jung, 2012) argue that research and teaching are not related and assert that heavy teaching loads do not essentially reduce research output in all situations. Other scholars (Sondari et al., 2017) even found it difficult to generate a consensus on the meaning of the time dimension as disagreements emerged from respondents and authors on whether time for supervision of graduate students and for structural position roles falls under teaching or under research. Ordinarily, the academic functions of teaching, student supervision and examination processing usually leave no time for scholarly obligations. This is more evident in institutions in the developing world, Uganda being no exception, where students' enrolments outmatch the academic staffing levels (Ramjaewon & Rowley, 2020; Wamala & Ssembatya, 2015). Since the reviewed investigation of the relationships between research management aspects and research productivity yielded varying results depending on the management variables examined and how they were quantified, and since some of those studies relied on secondary sources like systematic literature reviews while others were conducted in private universities and in specialised institutions offering particular courses like tourism and hospitality, business, accounting and finance, and STEM programmes, empirical, conceptual, methodological and contextual gaps emerged. Hence the need for this study to address and fill the gaps through a university-wide empirical study.

Methodology

The study employed a cross-sectional, correlational, exploratory mixed-method design to collect and analyse both quantitative and qualitative data, concurrently but separately (Creswell, 2014). Quantitative and qualitative datasets were compared to determine the existence of convergences, differences and combinations for proper validation and substantiation of findings (Creswell, 2014). The study was conducted in the seven academic units of Kyambogo University, the second largest of the nine public universities in Uganda, and the first to be created under the Universities and Tertiary Institutions Act (2001), with both sciences- and humanities-based faculties, following the same financial and other administrative regulations and facing similar infrastructural and funding challenges. This is thus a basis for the generalisability of the study findings from Kyambogo University to other public universities.

Study population

The study target population consisted of PhD-holding lecturers, deans of faculties and schools and the Directors of Quality Assurance, the Director of Human Resource Management, the University Bursar, the University Librarian and the Director of ICT, totalling 168. The university has 156 PhD-holding lecturers (KYU newsletter, Jan./Feb. 2021). This assertion was corroborated by records from faculty administrators about the number of PhD academic staff in their faculties. The study's focus on only the PhD-holding lecturers was guided by the Kyambogo University Human Resource Policy (2014) and the Makerere University Appointment and Promotion Policy (2006 –2014), which set a doctoral degree as the consensual minimum requirement for one to fully qualify as a lecturer. This is besides the fact that PhD training programmes are intended to, among others, build the trainees' research experience. PhD-holding academics are thus assumed to be more competent in conducting

research, preparing presentations, writing publications and supervising graduate students' research (Alhija & Majdob, 2017; Heng et al., 2020; Henry et al., 2020).

Sample size

There are seven teaching academic units in Kyambogo University from which lecturers were drawn to participate in the study, as shown in Table 1 below.

Table 1: Population of PhD-holding academic staff from faculties/schools and the samples obtained

No.	Faculty/School	No. of PhDs	Sample
1	Arts and Social Sciences	36	33
2	Education	27	25
3	Engineering	16	15
4	Science	43	39
5	Special Needs and Rehabilitation	08	8
6	Vocational Studies	17	16
7	School of Management and Entrepreneurship	09	09
	Total	**156**	**145**

Source: Guidelines to Kyambogo University Faculty websites, 2021; KYU Vice Chancellor's speech at the induction of the new general assembly, 2021

Sampling design

The sample size was determined by Krejcie and Morgan (1970)'s Table of Sample Size Determination. Out of the 156 lecturers, the table suggested a minimum sample of 145 participants. Of the 145 respondents to whom the questionnaire was distributed, only 127 lecturers responded and filled in copies were returned to the researcher, representing a return rate of 88%, which is considered adequate for social science studies (American Association of Public Opinion Research, 2011). Out of the seven faculty/school deans, the researcher managed to access three deans for interview sessions. Of the three Directors of Quality Assurance, Human Resource and ICT Department, the researcher managed to access two, while the University Librarian and the University Bursar were also interviewed, bringing the total of the accessed population to 134 participants.

Table 2: Summary of the study population

Category of department	Target population	Sample size	Accessed population
Lecturers (PhD holders)	156	145	127
Faculty/School Deans	7	7	3
Directors of Directorates/Departments	3	3	2
University Bursar	1	1	1
University Librarian	1	1	1
Total	**168**	**157**	**134**

The sampled population was divided into seven clusters, each corresponding to one of the seven faculties/schools. To obtain a representative sample of lecturers from the seven faculties, cluster

sampling was used, while convenience sampling was employed to get the respondents from each faculty. The researcher first contacted respondents through phone calls and e-mails and asked them to participate in the study. Those who responded positively received the questionnaire either in hard copy or in soft copy using the Google forms application. The sample of participants required for interviews was subjectively selected by the purposive sampling method among participants with the required information (Kumar, 2014). Purposive sampling was thus used for the selection of Deans of Faculties, the Directors of Quality Assurance, Human Resource Management and ICT, the University Librarian and the University Bursar, who were believed to have the needed information on research management in the university.

Data collection

The survey data collection involved the use of two data collection methods, namely a questionnaire survey and interview method. A five-point Likert scale self-administered questionnaire was administered to the lecturers, while an open-ended interview guide was used to collect qualitative data from the interview participants. The five-point scale on agreement and frequency was considered to clearly capture valid and reliable data on the opinions of the respondents on research management and research productivity (Pearse, 2011). Data collection tools were treated to expert opinion validation by three management experts, two of whom were at the rank of senior lecturer and the third at that of associate professor for content validity, whose index was 0. 833 for research management and 0.783 for research productivity. The questionnaire was pilot-tested on lecturers at Makerere University Business School and reliability tests were conducted using SMART-PLS to generate measurement models, which revealed Cronbach alpha and composite reliability values of 0.779 and 0.858, respectively, for research management while the same measures for research productivity stood at 0.797 and 0.881, respectively. Changes that were recommended by the validation panel, and those identified as needed during the pilot test, with regard to the wording of items, the design of scales, and the instructions for completing the instruments were incorporated into the instruments.

Data collection procedure: The research was approved by the Kyambogo University Graduate School, cleared by the Gulu University Research Ethical Committee, Uganda National Council for Science and Technology and Kyambogo University secretary to obtain data from the university. The researcher contacted the lecturers through the faculty administrators and heads of department, who provided the respondents' telephone and e-mail address contacts, on which they were called and sent e-mails requesting them to participate in the study and to indicate the mode of questionnaire delivery. The number of positive responses obtained was 149, and questionnaires were distributed together with an introduction letter, a clearance letter and a consent form to the respondents. Twenty-seven respondents opted for online questionnaires while 122 received hard copies. Similarly, written requests for interviews with the interview guides, introductory and clearance letters, and consent forms were distributed to the sampled interview participants. Three deans, two directors, the University Librarian and the University Bursar accepted the request, and interview dates and time appointments were fixed. The researcher took notes of the participants' responses, without video- or audio-recording of responses, as this made most of the participants uncomfortable and the researcher realised that this was going to compromise some of their responses to interview questions.

Operationalisation and measurement of study variables

The dependent variable of the study was operationalised as number of journal articles published in peer-reviewed journals, book chapters published, research conference papers presented and graduate students (at master's and PhD levels) supervised to completion per lecturer in the previous five years (2015-2019). These measures of research productivity had been employed by several scholars (Henry et al., 2020; Ifijeh & Ogbomo, 2018; Jameel et al., 2019; Kim et al., 2007) in differing contexts, from which the study selected and adapted five widely used items that fit the Kyambogo University research contexts and modes across disciplines in the university. To address the quality issues, the data collecting instrument specified and collected data on the number of publications in peer-reviewed journals, since they are deemed to be of higher quality than non-peer-reviewed journals (Starovoytova, 2017). The items on research management were adopted and modified from Bay and Clerigo (2013), Kotrlik et al. (2002) and Ghabban et al. (2019), with some additional items incorporated to align with the Kyambogo University research management structures. All negative items were reversed and coded during analysis to appear positive.

Findings

The researchers conducted descriptive statistics to establish the strengths of each variable in the study. Table 3 gives the pertinent results.

Table 3: Research management descriptive results (N = 127)

	Research Management		SD	D	UN	A	SA	Mean
1	Has a well-established research and innovations unit	*f*	**46**	**45**	**14**	**17**	**5**	**2.13**
		%	36.2	35.4	11.0	13.4	3.9	
2	Has a developed research and innovations implementation manual to guide the implementation of the research policy	*f*	**33**	**45**	**29**	**17**	**3**	**2.31**
		%	26.0	35.4	22.8	13.4	2.4	
3	Has a functional University Research Grants and Publications Committee to support lecturers' research activities	*f*	**7**	**30**	**13**	**56**	**21**	**3.43**
		%	5.5	23.6	10.2	44.1	16.5	
4	Hires research assistants to support lecturers' research activities	*f*	**57**	**43**	**12**	**10**	**5**	**1.92**
		%	44.9	33.9	9.4	7.9	3.9	
5	Allocates teaching loads that leave lecturers with enough time for research activities	*f*	**30**	**56**	**13**	**22**	**6**	**2.35**
		%	23.6	44.1	10.2	17.3	4.7	
6	Factors in the time spent on research activities when computing lecturers' workloads	*f*	**47**	**45**	**15**	**15**	**5**	**2.10**
		%	37.0	35.4	11.8	11.8	3.9	
7	Has formally established collaborations with other research organisations for lecturers' research activities	*f*	**10**	**40**	**37**	**30**	**10**	**2.92**
		%	7.9	31.5	29.1	23.6	7.9	
8	Organises regular research dissemination conferences for its lecturers	*f*	**27**	**65**	**14**	**17**	**4**	**2.26**
		%	21.3	51.2	11.0	13.4	3.1	
9	Has its own functional journal for publication of lecturers' research outputs	*f*	**83**	**28**	**7**	**7**	**2**	**1.56**
		%	65.4	22.0	5.5	5.5	1.6	
	Overall mean							**2.33**

Source: Primary data

The overall mean (2.33) implies that research management systems, processes and units were still weak in the university. Specifically, seven of the nine items measuring this dimension had low means falling below 2.5. Such items had cumulative percentages lying on the side of low research management systems, structures and practices. For instance, on the item "The University hires research assistants to support lecturers' research activities", only 12% agreed with the statement, as opposed to the 79% of the respondents who disagreed, with a mean of 1.92. Such a perception implies that lecturers miss out on the support of research assistants, who would play a vital role in helping lecturers in field data collection and entry activities in a similar way the university hires teaching assistants to support lecturers in conducting tutorials in their teaching function. On the item "The University has a well-established research and innovations unit", 72% of the lecturers disagreed with the statement, in contrast with only 17% who responded in the affirmative. This implies that the university lacks research management structures to spearhead the implementation of the research and innovations policy. However, regarding the collaboration item "The University has formally established collaborations with other research organisations", 32% agreed with the statement, 39% disagreed, while 29% were undecided. The sharp division of opinion and the big number of undecided responses could imply that many lecturers had no information on the research collaboration opportunities that the university had formally established with external players from which they could immensely benefit in terms of research funding, training and co-authorships. Such findings further imply that research management as a form of support was still very low in the university.

The table below shows descriptive results for research productivity, which was the dependent variable for the study.

Table 4: Research productivity descriptive results (N=127)

	Research Productivity							
	Articles Publication		*Never*	*Rarely*	*Sometimes*	*Always*	*Frequently*	**Mean**
1	I publish my articles in peer-reviewed journals	**f**	**4**	**11**	**32**	**59**	**21**	**3.65**
		%	3.1	8.7	25.2	46.5	16.5	
2	I collaborate with members within my department to develop research publications	**f**	**13**	**34**	**26**	**32**	**22**	**3.13**
		%	10.2	26.8	20.5	25.2	17.3	
	Book Authorship							
3	I author book chapters in my academic disciplines	**f**	**20**	**40**	**40**	**16**	**11**	**2.67**
		%	15.7	31.5	31.5	12.6	8.7	
4	I author books in my academic disciplines	**f**	**41**	**42**	**20**	**10**	**14**	**2.32**
		%	32.3	33.1	15.7	7.9	11.0	
	Conference Presentation							
5	I present papers in my faculty conferences	**f**	**23**	**40**	**29**	**23**	**12**	**2.69**
		%	18.1	31.5	22.8	18.1	9.4	
6	I present papers in national conferences	**f**	**16**	**32**	**39**	**26**	**14**	**2.92**
		%	12.6	25.2	30.7	20.5	11.0	

	Research Productivity							
	Articles Publication		*Never*	*Rarely*	*Sometimes*	*Always*	*Frequently*	**Mean**
7	I present papers in international conferences	**f**	**6**	**19**	**36**	**41**	**25**	**3.47**
		%	4.7	15.0	28.3	32.3	19.7	
8	I participate in formal departmental research teams to prepared conference papers	**f**	**8**	**26**	**34**	**38**	**21**	**3.30**
		%	6.3	20.5	26.8	29.9	16.5	
	Student Supervision							
9	I supervise master's students to timely completion	**f**	**9**	**17**	**24**	**40**	**37**	**3.62**
		%	7.1	13.4	18.9	31.5	29.1	
10	I supervise Ph D students to timely completion	**f**	**50**	**26**	**10**	**29**	**12**	**2.43**
		%	39.4	20.5	7.9	22.8	9.4	

No	**Articles Publication**		**0**	**1 - 2**	**3 - 4**	**5 - 6**	**7 - 8**	**Mean**
11	Number of peer-reviewed journal articles published	*f*	**6**	**35**	**45**	**13**	**28**	**3.17**
		%	4.7	27.6	35.4	10.2	22.0	
	Book Authorship							
12	Number of book chapters authored	*f*	**70**	**44**	**10**	**2**	**1**	**1.58**
		%	55.1	34.6	7.9	1.6	0.8	
	Conference Presentation							
13	Number of conference papers presented	*f*	**17**	**29**	**30**	**26**	**25**	**3.10**
		%	13.4	22.8	23.6	20.5	19.7	
	Student Supervision							
14	Number of master's students supervised to completion	*f*	**25**	**29**	**21**	**16**	**36**	**3.07**
		%	19.7	22.8	16.5	12.6	28.3	
15	Number of PhD students supervised to completion	*f*	**105**	**13**	**6**	**2**	**1**	**1.28**
		%	82.7	10.2	4.7	1.6	0.8	
	Overall mean							**2.82**

The overall mean (2.82) implies generally low research productivity in the university. Specifically, seven of the 10 items used to measure research productivity had high cumulative percentages lying on the side of low research productivity. For instance, 58% of the lecturers indicated that they rarely collaborated with members within their departments to develop research publications, 81% and 79% hardly authored books and book chapters, respectively, in their academic disciplines, 72% rarely presented research papers in faculty-based conferences, while 69% hardly presented papers in national conferences. This implies that teaching faculties in the university rarely organise academic conferences for their lecturers to present papers on their research findings. Regarding graduate students' research supervision, only 32% of the lecturers indicated that they had supervised PhD students' research to completion, as opposed to 39% who attested that they had never supervised

any PhD student's research. In a quest to further examine lecturers' research productivity, the study sought to analyse their productivity counts regarding the four measures of research productivity in the previous five years (2015–2019). The results still revealed low research productivity. For instance, 5% of the lecturers in the sample had never published any article in a peer-reviewed journal, while 55% indicated that they had never authored a book chapter, 14% indicated that they had never presented a conference paper, 20% had never supervised a master's degree student, and 83% had never supervised a PhD student to completion.

Qualitative findings

The qualitative findings indicated the diverse views of interview participants with regard to the level of research management support made available by the university and the level of lecturers' research productivity.

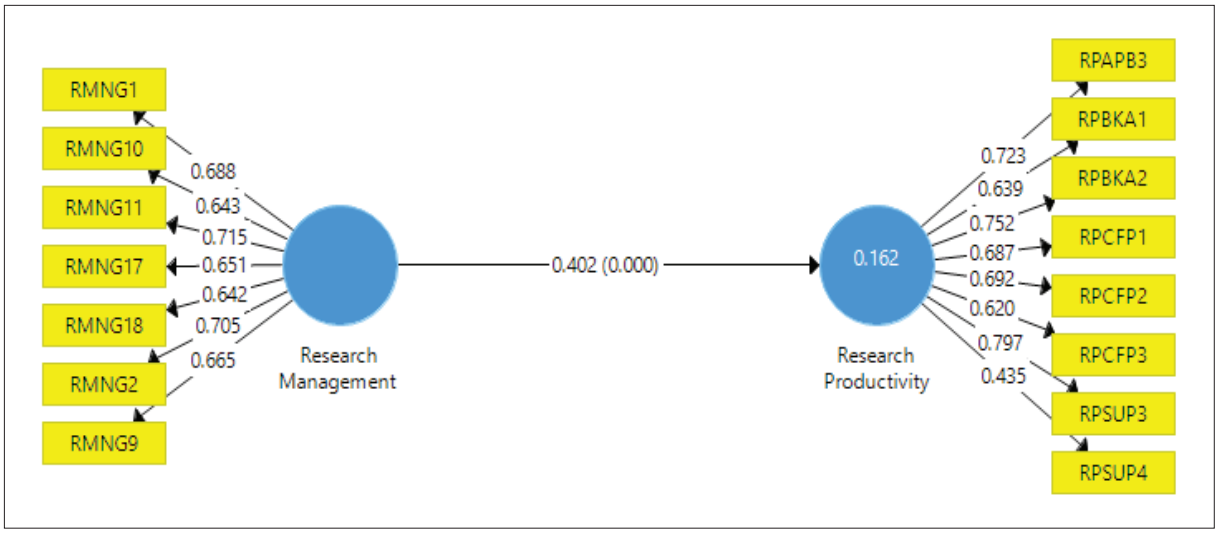
***Research management*:** The qualitative results were aligned along three main themes, namely: *research training and mentoring*, *research monitoring*, and *research management units*. These were assumed to create a favourable research environment in the university. One of the outstanding findings concerning research training and mentoring was the lack of experienced senior staff at the rank of associate and full professor to mentor the new and younger staff members in scholarly writing, grant proposal writing and publications writing. It, therefore, becomes difficult to pass on research competencies from one workforce generation to another, which is intended to build a solid pool of highly productive researchers. Another emerging issue about research management was research monitoring in the university. The findings revealed that there were no monitoring and tracking system to follow up lecturers' research progress from conception to dissemination of research findings, for purposes of extending support towards their research efforts. The findings revealed that the university management had not yet taken the evaluation of lecturers' research output as a priority, since it was still up to the individual lecturers to submit their publications for promotion.

Research management units are deemed relevant in coordinating various forms of research support to lecturers, ranging from identification of research funding opportunities, internal and external partnerships and collaboration opportunities, training staff in grant-winning proposal writing and ethical clearance, to monitoring and tracking research progress. The findings indicated that the university lacks a research and innovations office at the deputy vice-chancellor level in its structure, and that it lacks also a grants office to look out for calls for grants research proposals and guide staff on how to apply for them. The findings further revealed that there is no research ethical committee for ethical clearance of research projects. In addition, the findings revealed that the university does not have its journal for the dissemination of research. However, the findings indicated that the university has concentric layers of research grants and publications committees, ranging from departments to faculties and finally to the overall university level.

***Research productivity*:** Qualitative findings from interviews were interpreted to answer the second research question regarding the level of research productivity among lecturers in Kyambogo University. The emerging themes from the research productivity variable were aligned with the indicators of the variable in the study, namely: a*rticles publication, book authorship, student supervision and conference presentation*. The findings generally revealed that research productivity in all applicable forms is still low in the university, with book authorship being the lowest perceived form while conference paper presentation was the most visible form, although the quality of papers presented remains too poor to fetch awards. The findings from interviews confirmed the quantitative findings

which rated book authorship to be the lowest indicator of research productivity in the university. The number of graduate students supervised to completion indicates the level of a lecturer's engagement in research activities, hence his/her level of productivity.

Quantitative findings



The study objective sought to investigate the effect of research management on research productivity, hence the hypothesis that there is a statistically significant effect of research management on lecturers' research productivity in Kyambogo University.

Table 5: Structural equation model results

	Beta	STDEV	T Statistics	P- Values
Research Management → Research Productivity	0.402	0.070	5.754	0.000

Structural equation modelling results established a positive significant effect of research management on lecturers' research productivity in Kyambogo University ($\beta = .402$, $p < .05$). The findings thus led the study to accept the second hypothesis that there is a statistically significant effect of research management on lecturers' research productivity.

Discussion

Level of research management

Every university is expected to institute sound research management systems, structures with units and practices that promote its research function. The qualitative findings indicated that the university's research management was weak, with many departments lacking senior staff to train and mentor the younger junior staff members in research activities aimed at building a solid pool of active and experienced researchers in line with the university research and innovations policy objectives. Besides, the findings indicated the absence of annual research performance targets from faculties and departments, and descending to individual academics regarding research training and output. The qualitative findings also revealed the absence of supportive monitoring and tracking systems for lecturers' research performance. The results revealed the absence of guidance given to department heads on how to track research performance in their departments, the absence of a record of lecturers' research performance, and the non-existence of evaluation of lecturers' research output

by departments, faculties, the graduate school and the Quality Assurance Directorate. Consequently, there is no automatic and accelerated promotion of academic staff based on outstanding research performance. The findings further indicated the absence of research management units, such as the research and innovations office to manage research activities, coordinate research teams, partnerships and collaborations, secure research grants, and organise research conferences and training programmes, among others. The Research Ethical Review Committee and the university journal that would help to ease the lecturers' research ethical clearance and publication processes of their research findings respectively are also lacking.

The above findings are at variance with earlier findings (Beerkens, 2013; Ramjeawon & Rowley, 2020), who established that the increase in research output among academics in Australian and South African universities was a result of deliberate efforts to professionalise research management with universities appointing high-level academic and administrative staff at an equivalent level of deputy vice-chancellor whose sole responsibility was to oversee research activities. The findings were also in support of those by Fayera et al. (2017), Okendo (2018) and Kenya Commission of University Education (2013), who, in varying contexts, found poor management, supervision, monitoring and evaluation of university research programmes to be the major constraints on high-level research performance in Ethiopian, Kenyan and Tanzanian universities.

Level of research productivity

Both descriptive results and qualitative findings revealed low research productivity in the university. The low research productivity implies that the research culture in the university is still weak, with many academic departments lacking formally established research teams combining lecturers and graduate students to undertake joint research projects. The findings further strengthen the assertion that the research function in the university is still too individualized, with minimal institutional productivity support approaches. It is also worth noting that Kyambogo University does not have any centralised data bank on the research productivity of its lecturers and students apart from the repository under the Library Services Department. Depositing research output in the university repository is not a mandatory requirement, and many lecturers see no reason to deposit their scholarly works with the university after no support has been given to them during the research and publication process.

Book authorship was reported to be the lowest indicator of research productivity in the university. This could be attributed to the amount of time invested in book writing, the high costs of authoring and publishing books and the rigorous exercise of marketing books. With the absence of structured university support like the University Press to subsidise publishing costs and help lecturers to market their books, many lecturers tend to ignore book authorship and go for the easier-to-accomplish article publication and conference paper presentations. The university management should, therefore, consider instituting structured book publication support with incentives attached to motivate lecturers and increase the authorship of books and book chapters as part of the university research function.

Research management and research productivity

Descriptive results indicated a weak perception of research management as a form of support and low research productivity in the university. Likewise, structural equation modelling analysis results from testing the hypothesis that research management is a significant predictor of lecturers' research productivity. The findings confirm the notion that effective and efficient management practices are a

critical requirement for organisational performance (Beerkens, 2013; Ranjaewon & Rowley, 2020). The quantitative findings are at variance with some earlier findings (Jung, 2012; Johnson, 2013) that did not establish a strong direct relationship between research management practices, systems and structures, and research productivity as reviewed in literature. The quantitative findings, however, confirm those by Beerkens (2013), Ranjeawon and Rowley, (2020) and Pulford et al. (2020), who reported that intensifying research management through creating structures and systems increases research productivity growth, hence confirming the positive association between research management and research productivity. The significant positive relationship between research management practices, like the hiring and provision of research assistants to support lecturers' research activities, support earlier findings by Mody et al. (2018), Nafukho et al. (2019), Vabo et al. (2016), Kyvik and Aksnes (2015) and McGill and Settle (2012) who, in differing contexts, reported without exception that the provision of research assistants was positively associated with lecturers' research output.

Another university research management practice would be to facilitate the formation and operations of internal departmental, inter-departmental and inter-faculty research teams and collaborations. Such teams improve peer support, create platforms for research training and mentorship of junior staff by senior experienced staff in research activities, besides promoting inter-disciplinary synergies among lecturers. The significant effect of such research management practices thus implies that the absence of formal research teams and collaboration arrangements within the university could be a key predictor of the low research performance. The study findings were, therefore, in agreement with those of Nguyen et al. (2016), Khalil and Khalil (2019), Kwiek (2018), Putri and Sofyandi (2019) and Vabo et al. (2016), who found that research collaboration between colleagues at department and faculty levels provided peer support, especially in the form of training for younger and less experienced academics to improve their research skills, become more efficacious and motivated in addition to creating a supportive research culture for increased research outputs.

Besides internal university research teams and collaborations, inter-university and external collaborations between universities and other organisations, whether in industry, academia, non-governmental organisations or with state enterprises, are also assumed to bring together researchers from different backgrounds and contexts, resulting in inter-disciplinary synergies as well as research training opportunities. They also contribute to improvements in university research funding that is badly needed in underdeveloped countries like Uganda. The significant positive relationship between research collaboration management practices and systems and research productivity supports earlier findings by Abas et al. (2018), Ghabban et al. (2019), Garner et al. (2018) and Jameel and Ahmad (2020) who, in differing contexts, found university, government and industry research collaborations, international collaborations and inter-disciplinary research collaborations to be important factors for enhancing research productivity.

Conclusion and Recommendation

The study findings showed that research management as a support factor for research productivity in the university was low. The findings also imply that lecturers cannot improve on their research output without supportive management systems, practices and structures being in place in the university. Besides literature building on research management and research productivity for future scholars, the study clearly provides university administrators with pertinent practical information useful for designing and developing research management systems, practices and structures, with particular emphasis on instituting a research and innovations unit at the level of deputy vice-chancellor to

organise and coordinate all managerial support to the university research function, a research grants/partnerships management office to secure grants and research collaborations with research funding agencies, and also to offer training in writing grant-winning research proposals. A Research Ethical Review Board/Committee, a university journal and a press should also be established to speed up research clearance issues and to support journal publication and book authorship among its staff members to improve its visibility in the scholarly world.

Limitations

The study had proposed very rich mixed data collection methods, including self-administered questionnaires, interviews and document analysis. However, the absence of centralised records on lecturers' research output in the university limited the corroboration of findings from the self-reported counts to address the issues of respondent bias, for a comprehensive data analysis on lecturers' research output.

Areas for further study

The study concentrated on research management as an organisational support factor for research productivity. However, productivity is an interplay of organisational and individual employee factors such as self-efficacy, ambition, interest, age, sex, family responsibilities and levels of motivation. The study, therefore, recommends future researchers to explicitly examine the impact of individual factors on research productivity.

Declaration

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Conflict of Interest/Competing Interest

The researcher did not encounter any conflict or competing interests related to this study.

Availability of data and materials

The datasets used and/or analysed during the study are available from the corresponding author on reasonable request.

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Policy Support and Research Productivity among Lecturers in Ugandan Public Universities: Case of Kyambogo University

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Abstract

In today's competitive global higher education market, research productivity has become a dominant criterion for determining the university's effectiveness. Besides, high-quality research benefits individual academics, their departments and institutions by raising their global rankings, recognition and prestige, with multiple accruing benefits. However, in a situation of low research output from Ugandan public universities, there is urgent need for increased organisational support to facilitate lecturers in conducting this cardinal university function. This mixed-methods study was, therefore, intended to evaluate the effect of the university research policy on lecturers' research productivity in Kyambogo University, one of the biggest but relatively new public universities in Uganda. A correlational survey design guided the study using both qualitative and quantitative approaches. A sample of 127 PhD-holding lecturers, three faculty deans, Directors of Quality Assurance and Human Resource, the University Bursar and the University Librarian participated in the study. Data collected using questionnaire and interviews were analysed using structural equation modelling for quantitative data while thematic content analysis was used for qualitative data to establish relationships between the variables. The findings revealed moderate policy support for research productivity with a mean value of 3.07, a positive and significant relationship between the variables with a beta value of .416 and a P-value of .000. The study recommended the formulation and implementation of favouring and supportive policies to increase lecturers' research productivity in public universities. The findings will likely be used to inform university managers on generating practical policy interventions to boost research productivity among lecturers in public universities.

Keywords: *Lecturers; Policy support; Public university; Research productivity*

Introduction

Globally, universities continue to produce and transfer knowledge, and to act as a workplace for the discovery of new technologies through students' and academic staff research and innovation (Ghabban, Selemat, Ibrahim et al., 2019). High-quality research benefits individual academics, their departments and institutions by raising their global rankings, recognition and prestige, with multiple accruing benefits (McGill & Settle, 2012increasing research productivity in postsecondary institutions provides direct benefits to those institutions, departments, and individual faculty, and this re-search productivity is often dependent on institutional support. Understanding this relationship is important for doctoral students, as many enter academia after completing their studies, and their success as faculty can be highly dependent on their success in establishing a strong research pro-gram. The authors conducted a study to determine if individual computer science faculty receive institutional resources and support congruent with research requirements set forth in tenure and promotion guidelines. The results identify hidden requirements for tenure and promotion, includ-ing an emphasis on research collaboration, and find that the level of support in the 2009-10 aca-demic year remained stagnant from the previous year. Results indicate that faculty are not satis-fied with their level of institutional support and that the three areas in which additional support would enable them to increase their research productivity include staff support, release time, and funding for attending conferences. Results also indicate that untenured faculty receive less staff support, less funding for summer salaries and workshops and training, and less funding for im-provements to office space or facilities than their tenured colleagues.","author":[{"droppi ng-particle":"","family":"McGill","given":"Monica M.","non-dropping-particle":"","parse-nam es":false,"suffix":""},{"dropping-particle":"","family":"Settle","given":"Amber","non-dropping-particle":"","parse-names":false,"suffix":""}],"container-title":"International Journal of Doctoral Studies","id":"ITEM-1","issued":{"date-parts":[["2012"]]},"page":"167-198","title":"Identifying effects of institutional resources and support on computing faculty research productivity, tenure, and promotion","type":"article-journal","volume":"7"},"uris":["http://www.mendeley.com/documents/?uuid=bf65683e-7dd8-4a96-b9af-673956a63e92"]}],"mendeley":{"formattedCitation":"(McGill & Settle, 2012; Henry et al., 2020; Jameel & Ahmad, 2020). Research has thus moved from being an essential function to becoming a principal function for university standing, hence the need for increased organisational support in terms of policies, management structures and infrastructure to facilitate lecturers in conducting this dominant university function. The university research function has evolved into an elaborate and complex endeavour that requires well-laid-out policy guidelines, management structures and systems, adequate funding and a supportive research infrastructure. Worldwide, this has resulted in a sharp increase in university research productivity. However, at Kyambogo University, lecturers' research output remains low (AD Scientific Index, 2022; Fosci, Loffreda, Chamberlain et al., 2019; Kyaligonza, Kimoga, & Nabayego, 2015; Rukanyangira & Oidu, 2021).

Currently, the university is praised for churning out big numbers of graduates onto the employment market, but not for generating and disseminating applied knowledge for societal transformation. Several university rankings have revealed low levels of research and innovation in Kyambogo University. For instance, the AD Scientific Index Rankings (2022) has revealed low research productivity in the university, with only 24 active researchers among Uganda's top 500 scientists. Kyambogo did not post any researchers among the top 40 in Uganda. In many regional (African) university rankings based on research, Kyambogo does not appear among the top 200,while

in others, there is simply no data available on it (QS World University Rankings, 2021; Shanghai, 2018; SCIMAGO, 2022; THE, 2021; Webometrics, 2022). Such a deplorable state of affairs necessitated this study, whose aim is to establish the extent to which the university research policy supports its lecturers to undertake and sustain its research function. Research policy in this study refers to the availability of a supportive university research policy that prioritises and promotes lecturers' research as a core university function.

The objective of this study was to establish the effect of the research policy support on lecturers' research productivity in Ugandan public universities, with reference to Kyambogo University. To that effect, the study was guided by a research question: "What is the level of research policy support provided to lecturers in Kyambogo University for their research activities?" and a hypothesis: "There is a statistically significant effect of the research policy support on lecturers' research productivity in Kyambogo University".

Literature Review

Research policy

A policy is an important factor in achieving the objectives and reaching the level of success that any organisation aims to achieve. Supportive policies and their effective implementation thus remain a cornerstone of the enhancement of university research productivity. To that end, universities require research policies that support the achievement of their research goals in line with the national development research needs (Muia & Oringo, 2016). Formulating and implementing a supportive research policy in a university is the best way to enhance research productivity and make the measurement of research progress in a university easy to monitor (Cloete, Maassen, & Bailey, 2015; Ghabban et al., 2019; Kasozi, 2017; Santos & Horta, 2018). As a merger product of three basically teaching institutions, with research only being emphasised as a teaching component, Kyambogo University started without the necessary supportive research policies, research management structures and a supportive research infrastructure to implement the policies. Although the first Kyambogo University Research and Innovations Policy was formulated in 2014, the research function has remained weak in the university. It, therefore, remains unclear whether it is the policy that is not supportive enough to promote research output from the university academic staff.

Research policy and research productivity

Scholars like Ghabban et al. (2019), Heng, Hamid and Khan (2020), Latif (2015), Okendo (2018), Ryan and Daly (2019), Shahbazi-Moghadam et al. (2015), Sondari et al. (2017) and Starovoytova (2017b) tried to relate research policy to research productivity. For instance, Okendo (2018) identified the absence of an institutional policy on research productivity and sound policy guidelines to support research activities as major institutional constraints on research productivity in a Tanzanian university. Ryan and Daly (2019) identified lack of sound policies to facilitate and reward intensive research among other barriers to innovation and knowledge generation in the United Arab Emirates, while Starovoytova (2017b) found that the lack of institutional policy on research and publication was one of the institutional barriers to effective research performance among the School of Engineering academics from Moi University in Kenya.

The world over, universities have increasingly become modern entrepreneur engines and generators of knowledge through research, as a prerequisite for national development. This requires aligning university research policies with national development aspirations. This assumption is in line

with previous findings from the Kenya Commission for University Education report (2013),which revealed that poor alignment of university research with national development goals and aspirations was a strong predictor of the low research productivity in Kenya, while Latif (2015) reported that an increase in scholarly publications in Saudi universities was attributed to supportive policies to promote research, in line with the Saudi government's development policy focus shift from oil to a competitively advanced science- and technology-based economy.

Other scholars (Quimbo & Solabo, 2014; Sondari et al., 2017) found that lack of supportive university research policies and implementation systems were key factors leading to low research productivity among university academics in the Philippines and Indonesia. Ghabban et al. (2019) established that the university policy towards research was the most important factor in enhancing research productivity in Saudi universities. Similarly, Heng, Hamid and Khan (2020) found institutional orientation and research policies to be the most cited institutional factors influencing academic research productivity in the Global South. Similar findings had also been earlier confirmed by Shahbazi-Moghadam et al. (2015), among higher education institutions in Malaysia, Taiwan, Japan and China, hence concluding that the university research policy had a strong positive relationship with the enhancement of research performance in higher education institutions in the selected countries.

However, some of the studies cited above relied on secondary data from systematic literature review, which left methodological gaps. Other studies did not specifically concentrate on universities but higher education institutions in general, hence subject gaps. Some studies were conducted in emerging Asian economies with varying political, economic and social settings that were different from those in Uganda, hence contextual gaps. Other studies were conducted in private universities with policy frameworks that varied from those of public universities, hence contextual gaps. Lastly, the studies focused on different measures for research productivity, with only publication and/or citation as the indicators of research performance, while others considered the patents registered, grants won and reviews conducted to measure research output, hence conceptual gaps. The above gaps necessitated this study to fill them, by studying research productivity from a wider conceptual outlook, including publications, authorship, presentations and graduate research supervision as applicable to Ugandan public universities.

Methodology

Research design

The study employed the concurrent triangulation mixed research design, with correlational cross-sectional and exploratory survey designs to collect and analyse quantitative and qualitative data at the same time but separately (Creswell, 2014; Hanson, Creswell, & Petska, 2005). This enabled the study to confirm, cross-validate and corroborate results, as well as to offset the weaknesses in one method with the strengths in the other, for better understanding of the research problem (Cresswell, 2014; Cresswell & Plano Clark, 2011).

Study area

The study was conducted at Kyambogo University, one of the nine public universities, the first to be created under the Universities and Tertiary Institutions Act (2001). It is the second largest in the country, with seven academic units in both sciences and humanities, hence large enough and of importance as a model academic institution for upcoming universities. Kyambogo, just like other

public universities, follows the same financial and other administrative regulations and faces similar infrastructural and funding challenges. It was thus assumed that the organisational conditions that affect research productivity in Kyambogo are likely to prevail in other public universities managed under the same public policy framework, hence the generalisability of the study findings from Kyambogo to other public universities.

Study population

The study target population consisted of PhD-holding lecturers, deans of faculties and schools, the Director of Quality Assurance, the Director of Human Resource Management, the University Bursar, the University Librarian and the Director of ICT, totalling 168. There were 156 PhD-holding academic staff (Kyambogo University newsletter (Jan/Feb. 2021; records from faculties and departments). The focus on only the PhD-holding lecturers was guided by the university human resource policy requirements (Kyambogo University Human Resource Policy, 2014; Makerere University Appointment and Promotion Policy, 2006–2014), which consensually set a doctorate as the minimum requirement for one to fully qualify as a "lecturer" in a university. Secondly, PhD holders are deemed to be more research-competent and -confident (Heng et al., 2020) after receiving the required training for conducting the research and publication function, hence assumed to have the capacity to conduct research and publish findings (Alhija & Majdob, 2017; Brew, Boud, & Namgung, 2011; Heng et al., 2020; Henry et al., 2020).

Sampling design

The sample size was determined by Krejcie and Morgan (1970)'s table of sample size determination, which suggested a minimum of 145 out of the 156 lecturers.

Table 1: Population of PhD-holding academic staff from faculties/schools and the samples obtained

No.	Faculty/School	No. of PhDs	Sample
1	Arts and Social Sciences	36	33
2	Education	27	25
3	Engineering	16	15
4	Science	43	39
5	Special Needs and Rehabilitation	08	8
6	Vocational Studies	17	16
7	School of Management and Entrepreneurship	09	09
	Total	**156**	**145**

Source: Guidelines to Kyambogo University Faculty websites, 2021; KYU Vice Chancellor's speech at the induction of the new General Assembly, 2021

The sampled population was divided into seven clusters, each corresponding to one of the seven academic units. To obtain a representative sample of lecturers from the seven faculties, cluster sampling was used, while convenience sampling was employed to get the respondents from each faculty. The sample of participants required for interviews was subjectively selected by purposive sampling to obtain the required data from a sample deemed highly representative of the target population (Kumar, 2011).

Table 2: Summary of the study population

Category of participants	Target population	Sample size	Accessed population
Lecturers (PhD holders)	156	145	127
Faculty/school deans	7	7	3
Directors of directorates/departments	3	3	2
University Bursar	1	1	1
University Librarian	1	1	1
Total	**168**	**157**	**134**

Data collection

Of the 145 respondents to whom the questionnaire was distributed, only 127 lecturers responded and filled copies were returned, representing a return rate of 88%. Out of the seven faculty/school deans, the researcher managed to access three deans for interview sessions. Of the three directors – that of Quality Assurance, that of Human Resource and that of the ICT Department – the researcher managed to access two, while the University Librarian and the University Bursar were also interviewed, bringing the total of the accessed population to 134 participants. Data collection involved the use of two data collection methods, namely a questionnaire survey and interview method. A five-point Likert scale self-administered questionnaire was directed to the lecturers, while an open-ended interview guide was used to collect qualitative data from faculty deans, the Directors of Quality Assurance and Human Resource Management, the University Librarian and the University Bursar.

Data quality control

The data collection tools were treated to expert opinion validation by three management experts, two of whom were at the rank of senior lecturer and the third at associate professor rank for content validity whose index was 0.882 for policy support and 0.750 for research productivity. The questionnaire was pilot-tested on lecturers at Makerere University Business School and reliability tests were conducted using SMART-PLS. The generated measurement models revealed Cronbach alpha and composite reliability values of 0.843 and 0.882, respectively, for policy support, while the same values for research productivity stood at 0.797 and 0.881 respectively. Changes that were recommended by the validation panel and those identified as needed during the pilot test were incorporated into the instruments.

Data collection procedure

The study was approved by the Kyambogo University Graduate School, cleared by the Gulu University Research Ethical Committee, Uganda National Council for Science and Technology and the Kyambogo University Secretary to obtain data from the university. The researchers contacted lecturers through the faculty administrators and heads of department who made available the respondents' telephone and e-mail address contacts. They called and sent e-mails to those who could not pick up their calls, requesting them to participate in the study and for the preferred mode of questionnaire delivery. They obtained 149 positive responses, of which 27 opted for online questionnaires that were sent using the Google forms application, while 122 received hard copies. Similarly, written requests for interviews were distributed together with interview guides, introductory and clearance

letters, and consent forms. Three deans, two directors, the University Librarian and the University Bursar accepted the request, and interview dates and time appointments were fixed.

Operationalisation and measurement of study variables

The dependent variable of the study was operationalised as number of journal articles published in peer-reviewed journals, book chapters published, research conference papers presented and graduate students (at master's and PhD levels) supervised to completion per lecturer in the previous five years (2015–2019). This is a popular approach for measuring research productivity and has been employed by several scholars (Albert et al., 2016; Henry et al., 2020; Ifijeh & Ogbomo, 2018; Jameel et al., 2019; Jung, 2012; Iqbal & Mahmood, 2011; Kim, Pedersen, & Cloud, 2007). Specifically, Kim et al. (2007), used a scale of eleven items to measure research productivity as listed below: "*Submitted articles for publication in an academic or professional journal. Published non-refereed, research-related articles. Published or accepted refereed articles for publication. Published chapters in a book. Submitted a research proposal to a governmental or private agency. Written a research report for an agency, institution, or other group. Presented at professional conferences. Received institutional grants. Received external grants. Advisor for completed master theses. Advisor for completed doctoral dissertations*". Similarly, Ifijeh and Ogbomo (2018) used a scale of six items to measure their research productivity: *"Number of Journal articles published in referred and non-referred journals. Number of Books published. The number of Book reviews. The number of conference presentations. Number of grants obtained"*. From the above two studies, this study selected and adapted five widely used items that fit the Kyambogo University research context. The broad operationalisation of the dependent variable accounted for the different research productivity modes across disciplines in the university. The items on research policy were adopted and modified from Okendo (2018) and Ghabban et al. (2019). However, some additional items on research policy were incorporated by the researcher to align with the provisions of the Kyambogo University research policy and its supposed implementation set-up in the university.

Data analysis

Qualitative data analysis began with the commencement of interview data collection. Data was recorded in field notes and transcription done verbatim. Data was coded, categorized and themed to extract common themes and establish conceptual links, which were presented in the results section. Quantitative data was analysed by both descriptive and inferential analysis using the Statistical Package for Social Sciences (SPSS) computer program version 23 and SMART-PLS. The inferential analysis employed structural equation modelling (SEM) to measure the strength and direction of the relationship between variables.

Results

The study sought to establish the level of support provided by the Kyambogo University Research and Innovations Policy to lecturer' research productivity, in order to answer the research question "What is the level of policy support provided to lecturers in Kyambogo University for their research activities?" The descriptive statistics and interview findings gave the pertinent results.

Descriptive statistics for organisational support

Table 3.0: Research policy descriptive results (N = 127)

	Research Policy		SD	D	UN	A	SA	Mean
1	Promotes the provision of a high-quality research training environment for its lecturers							**3.23**
		%	8.7	23.6	15.0	41.7	11.0	
2	Supports lecturers to prioritise research among their core activities							**3.06**
		%	9.4	28.3	18.1	35.4	8.7	
3	Provides for the hiring of research assistants to support lecturers' research activities							**2.33**
		%	30.7	33.9	14.2	14.2	7.1	
4	Does not support the formation of inter-departmental research teams (R)							**3.19**
		%	7.9	25.2	18.9	36.2	11.8	
5	Does not support the formation of inter-faculty / school research teams (R)							**3.00**
		%	8.7	33.9	18.9	26.0	12.6	
6	Does not promote collaborative publishing of journal articles among lecturers in a department (R)							**3.06**
		%	7.1	33.1	18.1	29.9	11.8	
7	Promotes collaborative publishing of journal articles among lecturers across departments							**3.00**
		%	10.2	30.7	16.5	33.9	8.7	
8	Does not encourage lecturers to collaborate and publish articles with researchers from other institutions/ universities (R)							**3.11**
		%	8.7	33.9	12.6	27.6	17.3	
9	Provides for recognition of individual lecturers for promotion according to their research productivity							**3.72**
		%	3.1	17.3	7.9	48.0	23.6	
	Overall Mean for Research Policy							**3.07**

Source: Primary data

The results from Table 3.0 above revealed that the research policy provided moderate support for lecturers' research productivity, with an overall mean of 3.07 on a five-point Likert scale. The results further revealed that six out of the nine items used to measure the research policy had cumulative percentages showing divided opinions on the level of support provided by the university research policy. For example, on the reversed item "The research policy does not promote collaborative publishing among lecturers in the department", 42% agreed with the statement while 40% disagreed and 18% remained undecided. This implies that many lecturers (60%) did not feel that the university policy promotes internal research collaborations within academic departments, which would be vital for promoting lecturers' productivity through mentorship of junior members by senior lecturers in areas like scholarly article writing and publishing within departments. On the item "The research policy promotes collaborative publishing among lecturers across departments", 43% agreed with the statement as opposed to 41% who disagreed, while 16% remained undecided. This also implies that 57% of the lecturers felt that the university research policy does not promote interdepartmental research collaborations despite the interdisciplinary synergies derived from them, among other benefits. However, most of the lecturers (62%) agreed that the policy provides for recognition of individual lecturers for promotion based on their research productivity, as opposed to 20% who

disagreed. The item also had the highest mean (3.72). Nevertheless, most lecturers (65%) felt that the policy does not support the provision of research assistants to assist lecturers in their research activities like data collection and analysis, having the lowest mean value of 2.33. It is also worth noting that a sizable number of lecturers (16%) on average remained undecided on the level of support provided by the research policy to their research productivity. This could imply that such lecturers were not aware of the university research policy provisions, or were not actively engaged in research activities. The moderate research policy support for lecturers' research activities implies that the university needs to formulate and implement a more supportive research policy to boost its research function.

Qualitative findings

Level of research policy support. The research policy was indicated by three emerging themes that included *Institutional Research Guidelines*, *Collaboration Protocol* and the *Direct Assistance Policy*. Concerning Institutional Research Guidelines, guidelines on lecturers' workloads and on journals for article publication emerged as major elements of the research policy guidelines in the university. The key informants revealed that the university has maintained the minimum standard of 10 contact teaching hours a week, after which lecturers should engage in research and publication work. They also revealed that since the research publication activity does not generate any immediate financial returns to meet their financial obligations, lecturers take on extra teaching loads to generate additional income to make ends meet due to the economic dictates and obligations, mainly from conducting evening and weekend classes. The interview findings, therefore, reveal that once lecturers observe the requirements and guidelines for their teaching responsibilities from which they generate immediate and direct income, research and publication activities remain secondary since they do not generate immediate financial benefits that they need to keep their lives and families running. The findings imply that the mandatory teaching workload is appropriate but the need to make more money pushes lecturers to look for extra teaching loads, which reduces the time available for them to undertake research activities.

Concerning guidelines to journals for article publication, the key informants revealed that there were no clear policy guidelines for lecturers on the specific journals in which to publish their research findings, but it was left to individual lecturers to use their knowledge and experience to decide. Such findings imply that the research policy does not strongly guide the prescription of research publication outlets for the university academic staff as a supportive mechanism for quality research. Regarding Collaboration Protocol, the status of the policy requirement to guide the formation of research teams and the acquisition of partnerships and collaborations with external organisations to promote lecturers' research productivity was found to be inadequate. For instance, it was revealed that the university does not have a systematic policy approach to the formation of departmental and faculty research teams as well as institutionalised external collaborations. This is usually left to individual lecturers to look for research partners and establish collaborations that they deem helpful in promoting their research productivity. The policy is thus fundamentally inadequate on the collaboration function.

Regarding Direct Assistance, the findings revealed that the policy remains silent on the direct hiring and assigning of research assistants, as the case is with teaching assistants who help lecturers with teaching activities. They further revealed that the hiring of research assistants is catered for in terms of financing for up to two research assistants for senior lecturers and above in case there is

adequate funding from research grants, but that it was not in the policy structure to have research assistants in the university. The informants further argued that even when the policy framework could be assumed to adequately support research in the university, the research and innovations policy had not been implemented. The argued that the absence of the research policy implementation guide to streamline the management of research activities and promote productivity has contributed to the lag in research in the university, with academic staff remaining more active in teaching than in conducting research. The above revelations imply that as a tool of organisational support, the research policy does not strongly support lecturers' research activities to promote the university research function.

Quantitative findings

Inferential statistical analysis was conducted using SEM to establish the relationship between research policy support and research productivity in line with the study hypothesis that there is a statistically significant effect of the research policy support on lecturers' research productivity in Kyambogo University. Figure 1 and Table 2 give the pertinent results.

Figure 1: Structural equation model

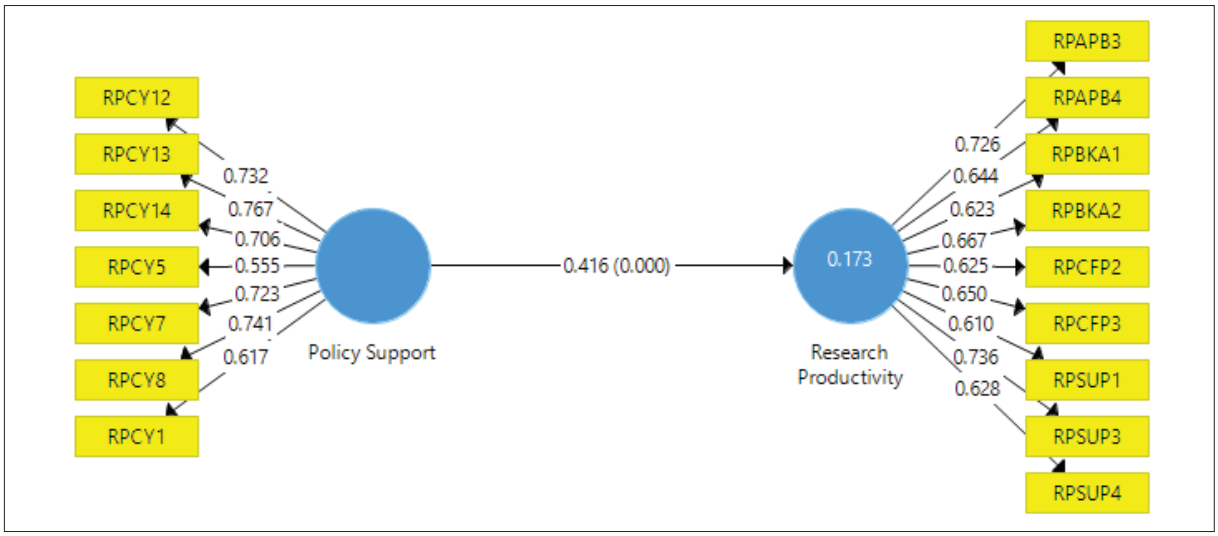

Table 4.0: Structural equation model results

	Beta	STDEV	T Statistics	P Values
Research Policy → Research Productivity	0.416	0.053	7.854	0.000

The structural equation model revealed that research policy has a significant and positive effect on lecturers' research productivity (β = .416. p< .05). The key indicators of the research policy support related to research collaborations expressed by RPCY13 – "Promotes collaborative publishing of journal articles among lecturers across departments" – which had an outer loading of .767, and research teamwork, which was expressed by RPCY 8– "Does not support the formation of inter-faculty / School research teams (R)", with an outer loading of .741.The finding led to the acceptance of the study hypothesis that there is a significant positive effect of research policy support on lecturers' research productivity.

Discussion

Level of research policy support

The qualitative findings revealed low policy support while descriptive statistics revealed a moderate level of support from the research policy for research productivity in the university. For instance, concerning policy guidelines to journals for article publication, the qualitative results revealed that there were no institutional guidelines by faculties on the journals for lecturers to publish their research findings. This may consequently expose young lecturers who do not have wide experience in publication journals to publish in predatory journals, thus reducing the quality of their research output in terms of citation impact and visibility of their work. This is because when lecturers publish their research findings in low-rated outlets, their scholarly works cannot be easily and widely cited at international level. Consequently, such works cannot be indexed by popular scholarly databases like Scopus and Web of Science, hence low research visibility. Such an observation is in line with the findings of Kwanya (2018), who revealed that the low publication and visibility of Kenya's academic scholars was also attributed to lack of preferred and recommended peer-reviewed journals by university academic departments to guide their members on where exactly to publish.

Regarding research collaboration protocol, both qualitative and descriptive statistics findings established that the policy requirement for the formation of research teams within and between academic departments and for securing of partnerships and collaborations both within and outside the university was inadequate. Internal research collaborations provide training and mentorship support, especially to junior lecturers, aimed at creating a bigger pool of competent researchers within academic units. Inter-departmental and inter-faculty research collaborations also help to promote multi-disciplinary research, which equips participating lecturers with diverse research skills and increases their productivity. External university research collaborations not only promote research training, mentorship and scholarly visibility, but also bring with them external funding opportunities for improved research infrastructure in the form of research laboratory and field equipment, computer sets, internet connectivity and better library services in the university. To that end, any functional university research policy should adequately support research collaboration in all its possible forms for increased productivity.

The university research policy was also analysed with regard to supporting direct research human resource assistance in the form of research assistants. Both qualitative and descriptive statistics findings revealed that the policy does not support the hiring of permanent or part-time research assistants to help lecturers in their research activities such as literature search, data collection and conducting computer data entries. Ideally, university lecturers would not spend their valuable time in the field collecting data or on computer sets entering data. Such functions would be delegated to research assistants who would mainly come from among graduate students as part of their research training. Such policy support guidelines would increase lecturers' research output.

Research policy and research productivity

Structural equation modelling results from testing the hypothesis that a supportive research policy is a significant predictor of lecturers' research productivity. These findings confirm those from previous scholars (Okendo, 2018; Ryan & Daly, 2018; Sondari et al., 2017; Starovoytova, 2017b; Kenya Commission of University Education, 2013; Latif, 2015; Ghabban et al., 2019; Heng et al.,

2020; Shahbazi et al., 2015), who found a significant positive relationship between the university research policy and research productivity.

The purpose of the Kyambogo University research and innovations policy (2014) is to strengthen the research culture, build research capacity and increase the contribution of the university to knowledge generation and innovations for national development. The policy sets out guiding principles that include creating an enabling environment for research and innovations, creating effective and efficient coordination of research management, providing adequate resources for research and innovations, and providing incentives and rewards for research and innovations, among others (Kyambogo University Research and Innovations Policy, 2014). Such principles come across as intended to provide a supportive framework for promoting the research function in the university. However, the ineffective implementation of the policy has made the achievement of such policy objectives a wild dream. This observation lends support to that of Latif (2015), who reported that the increase in scholarly publication among Saudi academics was a result of the deliberate effort by their government to shift its national development policy focus away from oil to developing the kingdom as an advanced competitive knowledge-based economy in science and technology, hence a supportive research policy in all its universities to promote both basic and applied research for the above cause.

Besides the weak perception of the research policy as supporting lecturers' research activities, interaction with respondents revealed that some lecturers were not aware that the university had a research and innovations policy while others were not acquainted with its content details. This finding aligned with the report on the gaps identified by the Kyambogo University Research and Innovations Policy Review (2020), whose first identified gap was the limited awareness about the existence of the policy six years after its approval. This implies that the university research policy has not been popularised and publicised among lecturers as a supportive framework for organising, coordinating and managing research activities in the university, hence a contributing factor to the university's low research productivity. Such findings are in agreement with those of Starovoytova (2017b), who found the absence of institutional policy on research and publication to be one of the institutional barriers to effective research performance among university academics from Moi University in Kenya.

The study findings also lend credence to the assumptions of organisational support theory which guided the study. The theoretical argument that employees' performance outcomes are directly related to their beliefs about the level of support they receive from the organisation (Eder & Eisenberger, 2008; Eisenberger, Cummings, Armeli et al., 1997) is augmented by the positive relationship between the perceived policy support and lecturers' research productivity. However, the supportive policy aspects were found to be low, yet they form part of the strategies for achieving the policy objectives, such as objective three which emphasises the need to identify and mentor potential researchers by building the capacity of staff and students to write research proposals and projects (Kyambogo University Research and Innovations Policy, 2014). The mismatch between what the policy states and what lecturers feel about its supportiveness could be attributed to the lack of policy awareness mentioned earlier and the ineffective policy implementation practices, hence the feeling of low policy support and, consequently, low research productivity. Such a position is also in conformity with that of Okendo (2018), who, in particular, identified the absence of an institutional policy on research productivity and sound policy guidelines to support research activities as major institutional constraints on research productivity in Mwenge University in Tanzania.

The study findings also uphold some of the propositions of the organisational support theory used to underpin this study. One of the antecedents of organisational support theory is organisational rewards and job conditions in the form of payments, financial rewards, promotions and favourable deployments. Most of the lecturers feel the policy does not recognise and reward active researchers through accelerated promotion and deployment as a motivation for increased productivity. A supportive research policy should thus provide for a mechanism to reward active researchers through automatic recognition for promotion and deployment of lecturers based on their research expertise, and accelerated promotion for highly active researchers in the university. This would require the policy to provide for monitoring and tracking lecturers' research progress right from departments through faculties, the graduate school, the Quality Assurance Department and the Human Resource Department, all coordinating to monitor, track, support, recognise and reward active researchers for increased productivity. Unfortunately, the policy remains silent on such managerial support, and this can explain the lecturers' perspective that the research policy is not supportive enough to the university research function.

In institutional management, all institutional activities are nested in the institutional policy frameworks that guide and support employee performance and help the institution to attain its formation objectives. The finding that the research policy is not strongly felt calls for immediate attention from university management to close the gaps in the research and innovations policy, to promote its awareness among academic staff, and to develop implementation guidelines and undertake ongoing policy implementation monitoring, evaluations and reviews for continuous improvement as a supportive framework to promote research in the university. This observation is supported by findings by several scholars (Ghabban et al., 2019; Heng et al., 2020; Shahbazi et al., 2015), who, in varying contexts, established that university policy towards research was considered a critical factor in enhancing research productivity in Saudi universities, China, Taiwan, Malaysia, Japan and other countries of the Global South. The majority of lecturers and key informants felt that the policy suffered from major gaps that make it ineffective in supporting the university research function. Its failure to promote quality research training and mentorship, to forge formal research collaborations, to hire research assistants, to recognise and reward research output and to provide implementation guidelines on issues like research dissemination and research management units and support structures constituted the major reason for the respondents' and participants' widely held view that the research policy was not strong enough to support high-level research productivity in the university.

Conclusions

It has been confirmed that there is a statistically significant positive relationship between research policy and research productivity. A functional and supportive policy is, therefore, a critical organisational support factor for enhancing the university research function, as it harmonises the infrastructural, funding, managerial and human resource capacity aspects to support lecturers' research activities. However, qualitative findings also revealed that many lecturers were not aware of the existence of a university research policy. This implies that policy formulation without creating adequate policy awareness and publicity among university lecturers, as key stakeholders, may not elicit the intended perceived support in order to achieve its objectives and promote the university research function in general.

Recommendations

Kyambogo University management ought to formulate a comprehensively supportive research and innovations policy, develop implementation guidelines for the policy and create policy awareness through departmental, faculty and quality assurance-based workshops, seminars and online debates among academic staff and management in order to increase the supportiveness perception of the policy towards the research function. This requires a critical review of the existing policy to make its provisions fair and supportive towards lecturers' research efforts, and robust implementation of the policy to generate a positive perception of the policy support to enhance research performance among university lecturers.

Policy Contribution

The findings of this study and its recommendations shall guide the institutions in national higher education sector like the Directorate of Higher Educational and Training, the National Council for Higher Education (NCHE) and university managers to formulate research policies that promote research training and mentorship, alongside policies that promote the institution of a supportive research infrastructure to promote the university research function. The findings will also guide university managers to create policy awareness among lecturers through both physical and online debates, workshops and seminars to get well acquainted with the research policy contents, in order to clearly understand and possibly improve on the supportiveness of the policy towards their research activities. Since the university research and innovations policy was found to lack a policy implementation guide, this study will guide the management of Kyambogo University, in particular, and other universities, in general, to always develop policy implementation guides alongside policy formulation to support effective policy implementation.

Declaration

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Conflict of Interest/Competing Interests

The researcher did not encounter any conflict or competing interests related to this study.
Availability of data and materials. The datasets used and/or analysed during the study are available from the corresponding author on reasonable request.

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Enhancing Research Output in Higher Institutions of Learning: A Case Study of Busitema University Research Model

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Abstract

University rankings have become a standard criterion of characterising higher institutions of learning irrespective of their specialisation, be it social sciences, natural sciences, health sciences or technology. The most highly ranked institutions worldwide are based on the same criteria despite the area of specialty and the geographical location. Higher institutional rankings are mainly based on pedagogy, strategic placement, research output in terms of publications, academic staff-student ratio, international linkage or partnerships, management of technological resources, and the existing human and infrastructural resources. This article attempts to address the possible ways to enhance research in developing institutions with a case study of Busitema University, Uganda. We propose the Busitema University Research (BUR) Model that can be used to analyse why the performance of higher institutions of learning (HIL) should be ranked based on the criteria of institutional research output (IRO). A survey was also conducted from 29 respondents and the data was analysed using Spreadsheet. From the generated results, it was established that the quality of academic staff highly determines the research output and thereby the increased university ranking. The results also formed the basis of the BUR Model development. The developed model will further be tested during a comprehensive study involving different HIL, especially in computing their respective institutional research index and rankings.

Keywords: *Higher institutions of learning; Institutional research index; Institutional research output; Research model; University ranking.*

Introduction

Research and development (RD) play a critical role in the socio-economic growth and development of a nation (Bayarçelik & Taşel, 2012; Blanco et al., 2016). Target 9.5 of the Sustainable Development Goals (SDGs) emphasises the enhancement of scientific research (SR) and upgrading the technological capabilities of industrial sectors in all countries by 2030 (United Nations, 2017). Countries are expected to achieve this target by encouraging innovation and increasing research expenditure and output in higher institutions of learning (HIL). Thus, HIL, in particular universities, play a pivotal role in championing the attainment of the global development goal through scientific research and innovations, providing the necessary expertise to implement the process and increasing RO as a source of required information (El-Jardali et al., 2018; The World Bank, 2007).

African governments have emphasised the growth of higher education (HE) on the basis that HE is a hypothetically transformational area of investment (Aduda, 2018). This is because HE has far-reaching social and political impacts in terms of creating policies and executing projects that would drive a nation's development agenda. This is only achievable if universities produce the intellectuals and the research output (RO) of the highest quality, which can only be done with adequate funding. Thus, funding for research in HE is desirable in almost all developing countries, including those in Africa (Saric et al., 2018). However, global assessment of the research and development expenditure, as a proportion of the Gross Development Product (GDP), reveals that many of the African countries invest less than 1% in RD, which is the African Union target (Karimi, 2015; Maiyo, 2015; UNESCO Institute of Statistics, 2018). In addition, the number of African researchers is found not to be proportional to the African population. For example, apart from Morocco, all the other African countries have less than 1,000 active researchers per one million inhabitants (UNESCO Institute of Statistics, 2018). This meagre funding for HE and research cannot directly translate into the quality (RO) and knowledge base required to ensure the sustainable socio-economic development and transformation of a nation. **T**he RO of some African universities is generally very low in comparison with some of the leading research universities, such as the University of Cape Town in South Africa (Musiige, 2014).

The scenario briefly described above proposes that African developing countries and, in particular, HIL need to revisit their respective research agendas, taking into consideration the critical role of scientific research in their national development agenda (Mwendera et al., 2017). As such, more emphasis should be put on the contribution of the higher institutions of learning to scientific research output (SRO) and knowledge creation (Clegg, 2012). Therefore, there is an urgent need to further explore the factors that contribute to RO in higher institutions of learning in developing countries so as to have informed guidelines for improving RO and thus university visibility in terms of ranking at national, regional and international levels.

Thus, quality research in HIL is increasingly becoming of great importance in terms of improved RO, knowledge base and other controls, as set by accrediting bodies. This is further evidenced in worldwide rankings of institutions (Marconi, Ritzen, 2015; Aithal, 2016; Taylor & Braddock, 2007). Universities are periodically ranked globally, regionally and nationally by the Ranking Web of Universities. The key determinants of institutional rankings are based mainly on the number of publications in peer-reviewed journals, the number of books published and the number of case studies and/or book chapters published during a given time (Aithal, 2016). For instance, in Uganda, Makerere University and Busitema University are ranked as the first and fifth, respectively, as per the July Edition 2022.1.3b (https://www.webometrics.info/en/Africa/Uganda).

Research output, as well as dissemination of new educational practices, is one of the major requisites for an academic lecturer to gain promotion in any HIL (Perry et al., 2015). But to this effect, there is such a low response of academic staff to the requirement to actively participate in scientific writing, leading to RO in terms of publications. This problem of a decline in RO cuts across all HIL especially in developing countries. Other than being the standard criterion for academic staff promotion to senior positions or professorship, RO has several other purposes, including the production of new knowledge, the transfer of existing knowledge to industry and other end users, upgrading of existing knowledge, improving the quality of teaching, learning and innovation, especially for Science, Technology, Engineering and Mathematics (STEM), and promoting creativity and skills development for the socio-economic transformation of the nation.

There has been such a rapid increase in the number of public and private universities in Uganda in the past few years. Uganda has a total of 68 universities and colleges considered under the ranking of universities (https://www.webometrics.info/en/Africa/Uganda). However, only 52 of these universities are accredited. They include 11 public and 41 private universities that have the potential to produce research output that can help in guiding the country in development and formulating policies (*https://ugcolleges.com/list-of-universities-in-uganda/*). In the most recent ranking, Busitema University has maintained its 5th position, thus continuing to be a leading university in the Eastern region of Uganda. The university has played a leading role in producing quality research and innovations, which will earn it a better ranking and potential to grow. With inadequate financial support to researchers, the research output of HIL remain low.

Generally, universities highly contribute to the process of generating scientific and innovative ideas to feed the nation's development process (Clegg, 2012). However, in most developing countries, scientific research capacity (SRC) still leaves a lot to be desired. For instance, academic staff are assessed based on courses taught and probably the number of students supervised, while the postgraduate students are assessed based on theses or dissertations, with less emphasis on publications in terms of scientific research output (Kpolovie & Dorgu, 2019).

The purpose of this study is to propose a model and state factors that will help developing countries like Uganda enhance scientific research output in HIL based on the factors associated with RO; and address the question of how to motivate researchers in HIL with a case study of Busitema University.

We suggested three main questions and their solutions to complete the key objective of this study. This study will help supervisors and students to increase research output in higher institutions of learning through reading, writing, understanding, analysis and dissemination of findings, which lead to the visibility and ranking of HIL.

Literature Review

Institutional repositories (IRs) play a significant role in changing and developing institutions. They have potentially increased the public value, ranking, prestige and visibility of researchers, and relevant universities (Asadi et al., 2019). The IRs that comprise research output need to be shared outside of the institution (across institutions and industries) so that institutions can know one another's research works and creativity for future collaborative projects (Sarker, Davis and Tiropanis, 2010).

In 2014, a study conducted at Uganda's oldest national university, Makerere, highlighted lessons and recommendations about PhD programme start-up, recruitment, supervision, international

collaboration, research infrastructure and environment for building institutional research capacity (Akuffo et al., 2014). Studies done by Tan and Thurasamy (2015) and Fauzi et al. (2019) assessed knowledge-sharing (KS) behaviour determinants to determine the factors that can contribute to an academic's research productivity, and the findings showed that an academic's KS behaviour has a substantial impact on research productivity.

According to a study by Kyaligonza, Kimoga and Nabayego (2015), severely constrained financial budgets coupled with other competing demands highly affect the financing of research in universities worldwide, particularly in Sub-Saharan Africa, and this has become a major problem for both government-aided and private universities. However, a study by Dundar et.al. (1998) identified institutional factors as also a major contributor to successful research output and an institution's visibility in terms of ranking. Therefore, these factors, coupled with funding constraints, highly hinder research output in HIL, Busitema University inclusive.

There are some models that have been developed to increase the research output in HIL. Aithal (2016) formulated a model of improving the higher educational output. Aithal discussed strategies to be followed to increase the number of research publications and subject book publications through effective faculty involvement and business case development through student involvement. Aithal and Kumar (2016) developed an ABC model based on calculating an institutional research index and a weighted research index and this was used to give grades to HIL.

A logistic regression model was used to determine the research productivity of academic staff at Universiti Teknologi MARA (UiTM). The results showed that personal, environmental and behavioural factors were paramount in influencing RP among the academic staff (Henry, 2020).

Whereas the above studies suggested strategies for increasing research productivity, there is need to enhance research output in HIL. The BUR Model seeks to answer the following research questions:

RQ1. What are the effects of the quality of academic staff on research output at Busitema University?

RQ2. What is the scale of research effort in terms of funding and time spent on research output at Busitema University?

RQ3. What is the effect of industrial partnership and collaborations on the perceived university rankings and research output at Busitema University?

The remainder of the study is organised as follows: Section 2 discusses the methodology used in this research; Section 3 presents the set-up of the BUR Model; Section 4 presents research findings and discussion; and Section 5 provides conclusions and recommendations.

Methodology

Online survey

An online survey study was conducted by researchers in STEM faculties. Reliability and content validity prior to surveying the targeted population of Busitema University researchers was critically done. An electronic-based questionnaire was designed in Google Survey form and the web-link was shared to different faculties and departments of Busitema University through e-mails and WhatsApp for a period of three weeks in August 2022. Twenty-nine participants from different departments, including Mathematics/Statistics, Technology and Engineering, Health Sciences and Education provided feedback. The questionnaire is provided in Appendix A of this article.

At this stage, simple descriptive statistics regarding data characterisation in terms of frequency distributions, percentages, means and medians were computed and used to display the existing

data patterns. The descriptive profile of the study sample used tables, bar charts or histograms to depict the patterns of influence of policies and practices.

Busitema University Research Model

This study aims to build a model that can be used as a tool for enhancing research output in HIL using Busitema University as a case study. Research output refers to publishable or published scholarly research, which may include articles in scientific or academic journals, book chapters in book series, papers, conference proceedings, posters, patents or lecture materials (https://www.lawinsider.com/dictionary/research-output).

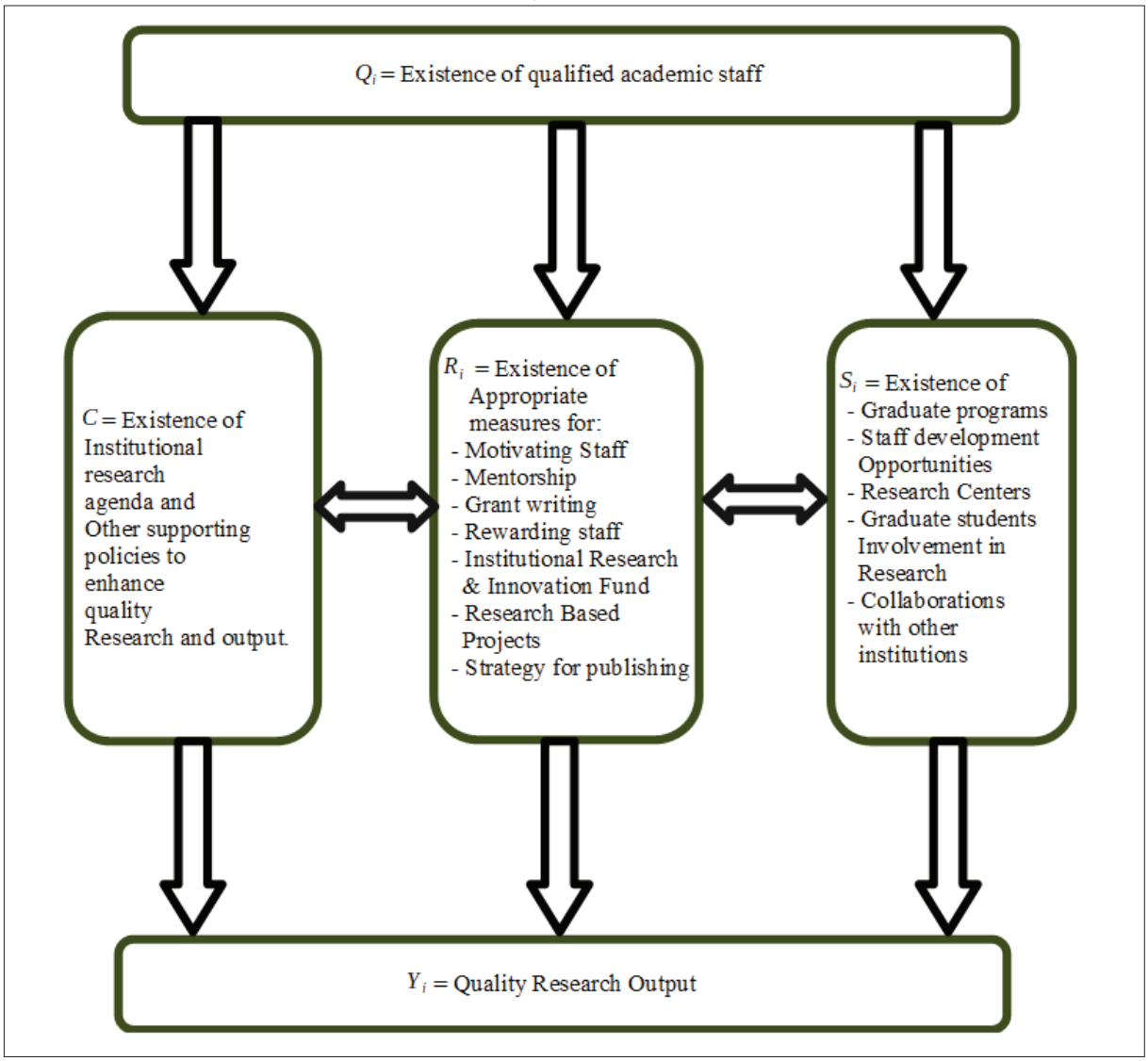
We state the following assumptions:

A1: There are qualified staff to conduct research on a regular basis.
A2: The university management is committed to motivating staff to actively engage in research.
A3: There is an operational university research agenda.
A4: There are senior staff to mentor junior staff in conducting research.
A4: There are fully developed master's and doctoral programmes.
A5: There are master's and doctoral students to actively engage in research.
A5: There are established collaborations with other institution in the region.

The above assumptions can be summarised into three major factors that highly contribute to a high rate of research output. These factors include:

(i) The quality of academic staff to steer ahead an institution's research agenda,
(ii) The scale of the research effort in terms of funding determined by the existence of appropriate measures for motivating staff, mentoring junior staff, training in grant writing, proper rewarding of staff, awarding the institutional research innovation fund, designing research-based projects, and a defined strategy for publishing.
(iii) The percentage of partnerships and collaborations with other institutions in the region where a particular university is located as well as the existence of graduate programmes, staff development opportunities, operational research centres, graduate students, and active involvement in research with other collaborating institutions.

Figure 1: The Structured BUR Model for Enhancing Research Output



From Figure 1, it can be seen that the major identified factors expected to influence the rate at which a given university is cited is the quality of its academic staff, the existence of an institutional research agenda, the existence of appropriate measures to motivate staff and the existence of graduate programmes. The second factor is what is often emphasised by policymakers in terms of the scale of a university's active involvement in research and development activities in a given area, whereby a critical mass of quality researchers and equipment is considered to influence quality research output. Thirdly, the university's industrial partnerships and collaborations with other researchers. This is because there are obvious advantages in a university working with industrial partners and research collaborators, and keeping abreast of all developments and innovations at the universities and in industries. Thus, one must expect that the universities collaborating with many researchers both in higher education institutions and industries would be mostly cited.

These factors would be represented by the variables:

P_i = the variable number of research outputs including, say, articles, book chapters and books obtained by the ith department or faculty in determining the university's ranking.

Q_i = the variable for the measure of the quality of the ith university's academic staff in the ith department or faculty.

R_i = the variable for the measure resource input, say money or technology spent by the ith department or faculty on research and development in the relevant area.

S_i = the variable for the measure of percentage of partnerships and collaborations of the ith department or faculty with other departments or faculties in the given universities in the region.

q_i = the parameter that measures the increase in the quality of staff in the ith department or faculty.

r_i = the parameter that measures the increase in commitment of resources to the ith department.

s_i = the parameter that measures the increase in the collaborations and partnerships as well as graduate recruitment into master's and doctoral programmes for the ith department or faculty.

Thus, the overall research output for the ith department or faculty department would be expressed as

$$P_i = (q_i \times Q_i + r_i \times R_i + s_i \times S_i) \quad \text{.....(1)}$$

and the total research output from a given university would be given by

$$\mathbf{P} = \sum_{i=1}^{n} P_i = \sum_{i=1}^{n} (q_i \times Q_i + r_i \times R_i + s_i \times S_i) \quad \text{.....(2)}$$

To compute the institutional research index that is used to determine the university's ranking, we consider the following:

X_i = the variable the measure of the number of, say, journal articles produced by the ith department or faculty.

Y_i = the variable the measure of the number of, say, book chapters produced by the ith department or faculty.

Z_i = the variable the measure of the number of, say, books produced by the ith department or faculty.

α_1 = the parameter for the measure of increase in the number of, say, journal articles produced by the ith department or faculty.

β_1 = the parameter for the measure of increase in the number of, say, book chapters produced by the ith department or faculty.

γ_1 = the parameter for the measure of increase in the number of, say, books produced by the ith department or faculty.

C = the parameter for the measure of the coefficient of good research agenda and relevant policies that support research output.

Thus, the university's research index would expressed as:

$$\Phi = \sum_{i=1}^{n} C\,(\alpha_i \times X_i + \beta_i \times Y_i + \gamma_i \times Z_i)/P \quad \text{.....(3)}$$

where is as expressed in equation (2).

Results and Discussion

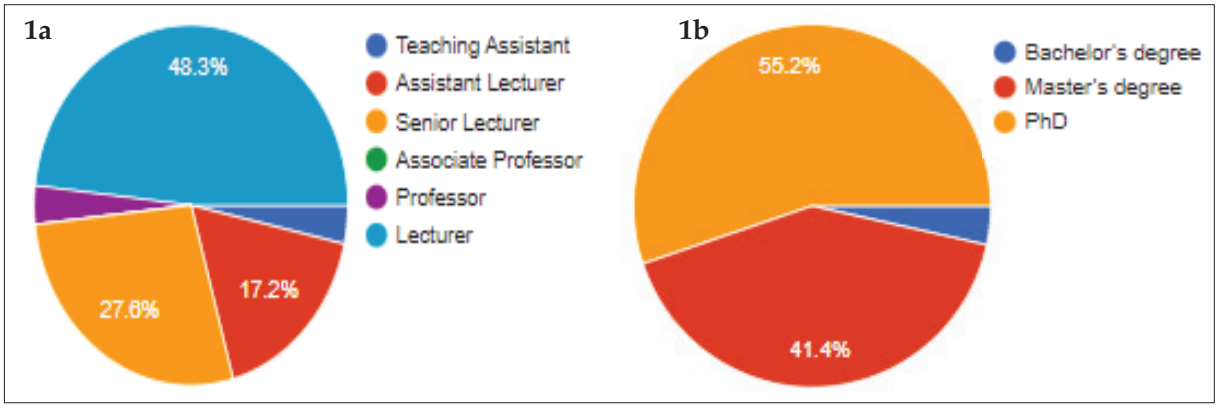
In this chapter we present the research findings and discussion of the results.

Quality of academic staff

Staff quality in the university is a major contributing factor to research output and, hence, university ranking. The university with quality staff in terms of academic qualification, including professors, senior lecturers and lecturers, is highly ranked. This study found that only a small percentage of academic staff are professors, while the largest percentage, at 48.3%, are lectures, 27.6% of whom hold senior positions and 17.2% are assistant lectures. Therefore, the results indicate that Busitema University should improve on the quality of academic staff by recruiting or promoting staff to professorship, associate professorship and senior lecturer positions in order to improve on the ranking the BUR Model suggests. Whereas 55.2% are PhD holders, 41.4% hold master's degrees,

indicating that the biggest number of Busitema academic hold a PhD. Figure 1a and Figure 1b show the representation percentages of the academic staff level and academic qualification, respectively.

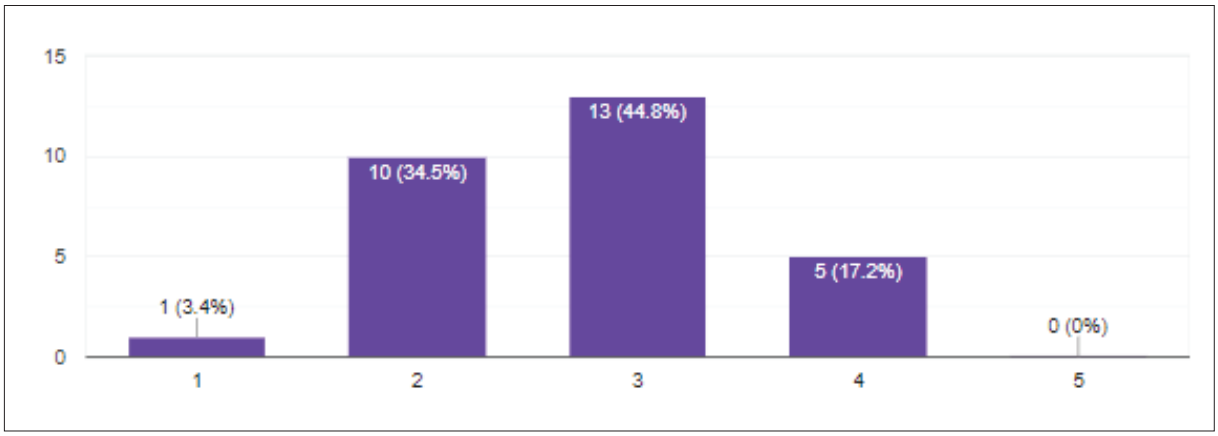
Figure 1a: Percentage of academic staff level; and Figure 1b: Academic qualification



Funding research and innovation

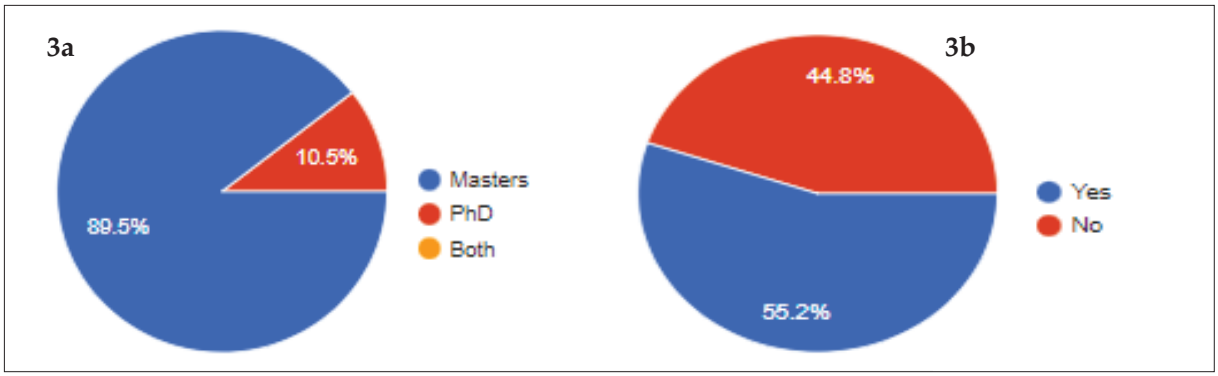
The study also revealed that Busitema University provides adequate teaching resources, research funds and time to influence research output. The university dedicates time and funds for seminars, workshops and training in research and innovation activities to its staff. For example, in July 2022 a three-day research writing retreat which was organised by the Directorate of Graduate Studies, Nagongera Campus and this gave opportunity to staff to commit time to research activities where the participants were able to polish and submit articles to peer-reviewed journals. Figure 2 provides the percentages of staff who either strongly agree, agree, disagree or strongly disagree that they are facilitated in professional research and innovation. Only 3.4% strongly disagreed.

Figure 2: Facilitation of academic staff to attend professional research innovation and development activities both within and outside the university



The BUR Model also suggests that another avenue for increasing research output is through having graduate and postgraduate programmes at the university. This study shows that Busitema University has these programmes in some of the faculties, therefore graduate students carry out research, a requirement for completion of the programmes. Figure 3a shows that these programmes exist and Figure 3b indicates that the biggest percentage of Busitema University staff are involved in the supervision of graduate students.

Figure 3a: Percentage of graduate programmes in the university; and Figure 3b: Percentage of academic staff involved in the supervision of graduate students



Partnerships and collaborations

Partnership and collaboration between researchers allow them to interact and, by so doing, they share new research ideas, methods and electronic library resources and sometimes undertake joint publications which, as well, leads to an increase in research outputs. The results of this study indicate that Busitema University academic staff corroborate those of other universities at both local and international levels (Figure 4). Through partnerships, the university applies for grants, though it was outside the interest of this study to investigate the number of grants won. Such grants support the academic staff in the publication, collection and management of data, and other activity in research. Figure 4 provides the details. The study also revealed that the university provides adequate teaching and research funds and time to influence research output. The academic staff provide an average amount of time for consultation with students and the university allocates funds for research to the staff. Busitema University has an institutional management system of reliable time schedules for research and innovation activities. It strongly dedicates time and funds for seminars, workshops and training in research and innovation, as shown in Figure 5. On average, the academics are facilitated to attend professional research, innovation and development activities, both within and outside the university. This contributes highly to research output, hence improving on the university citation and ranking. The university provides email and internet services, which boosts staff capacity to carry out research and innovation activities. It also provides sound policies to give feedback on matters concerning research and innovation initiatives. Research output is the result of efforts undertaken by staff of all ages and genders (see Figure 6) at Busitema University.

Figure 4: Collaboration with other universities

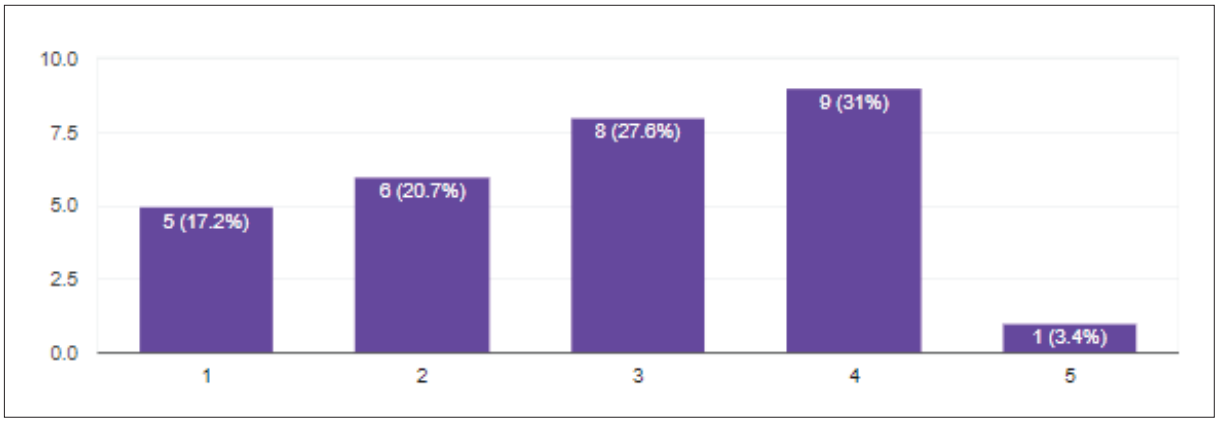


Figure 5: Academic staff are supported by Busitema University to attend professional research, innovation and development activities both within and outside the university

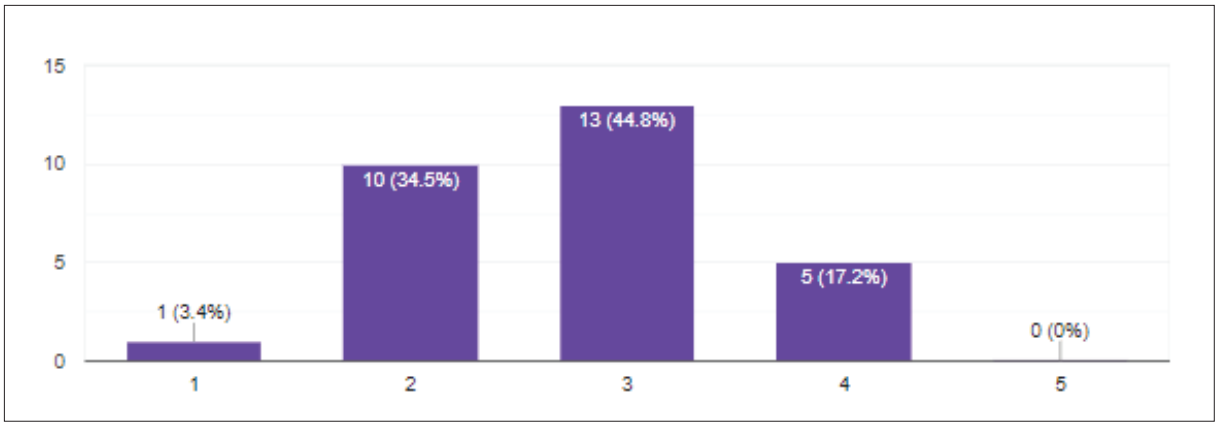


Figure 6: All ages and gender of academic staff influence the research output of the institution

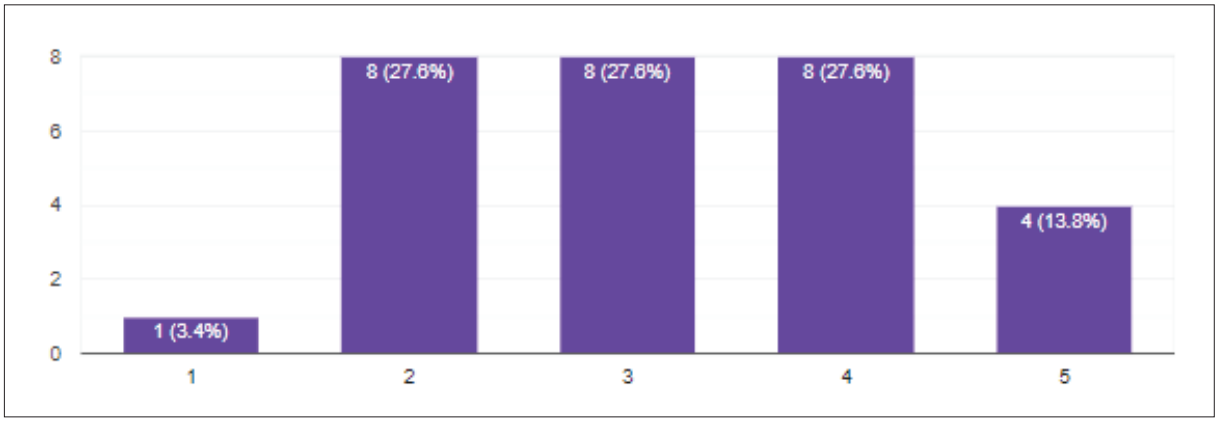
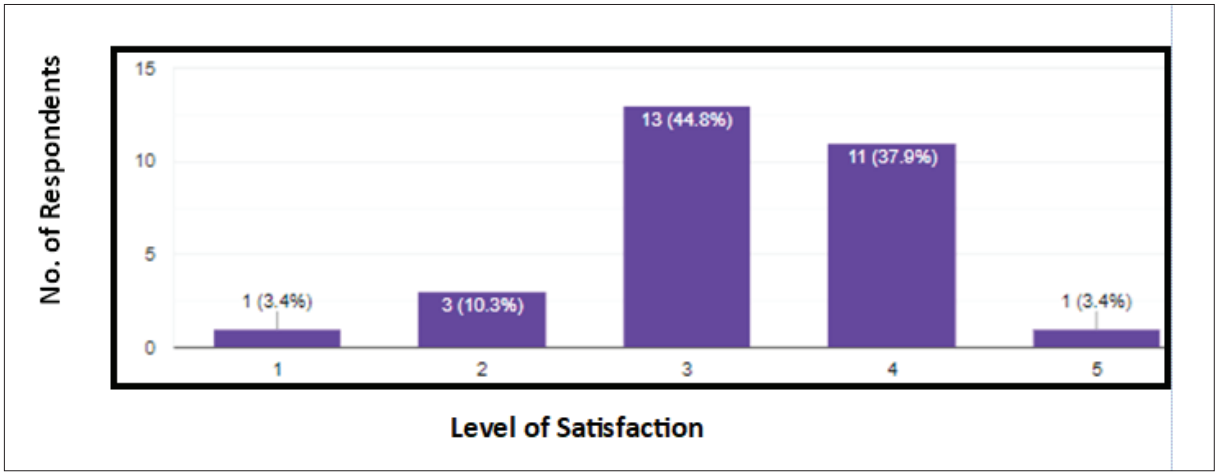


Figure 7: Availability of sound policies to support research and innovation activities



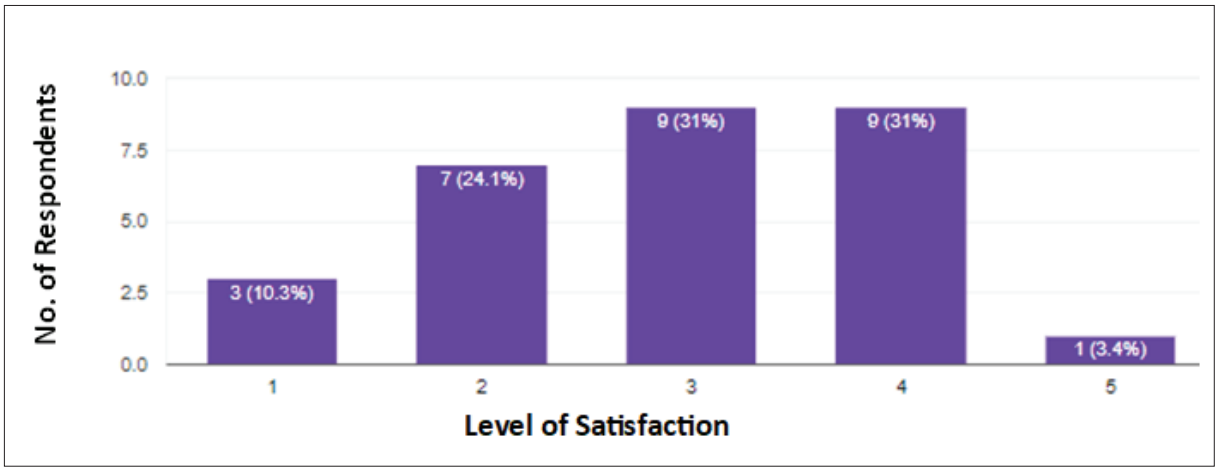
Research output is combined with the availability of a number of resources, including internet resources, a library, books and access to scientific databases, among others. The BUR Model considers this item under partnership and collaboration. The study eventually found that the minimum load at Busitema University is twelve hours, exclusive of time for supervision. This also contributes to low research output. Therefore, the BUR Model suggests that supervision hours be part of load allocation to staff to allow them to commit more time to research. Every staff member must get

involved in research irrespective of gender. Busitema University is gender-sensitive in terms of staffing and support for research and innovation activities.

Figure 8: Availability of adequate library facilities at the university

Figure 8 shows that the university tries to support the qualification influence of academic staff involvement in research and innovation by allocating average time and funds to supporting research and innovation output. Busitema University promotes sustainable support and coordination of staff development initiatives. It makes available all the necessary research information, funding opportunities and authorisation for external research and innovations.

Figure 9: Allocation of time and funds to staff for conducting research



However, there are insufficient computer laboratories and appropriate software for quality programming. The teaching in Busitema University is no different from other public and private universities of Uganda in terms of credit hours per course, which is 3CU. The difference lies in the load allocation, which is 12 hours, as compared to 6–9 hours per week in other universities. The graduate school at Busitema University handles all research activities, including the research agenda and innovations. Although the fund is not substantial as compared to the allocation in some reputable Ugandan universities, such as Makerere University, at least an allocation is made to the research vote. Recently the government allocated Ush. 1 billion to the university to support research

and innovation. The Busitema academic staff are supported to attend seminars, disseminate results in conferences and workshops and undertake training in research and innovation activities.

Industrial partnership and collaboration contribute to only 2% in the BUR Model, yet through collaboration new research ideas and innovations are created, which increases research output. Through collaboration, e-learning materials are shared, joint research activities are carried out, and joint supervision of MSc and PhD students, is easily done and, therefore, improves citation and the visibility of the university.

Conclusion and Recommendations

Following the findings we, therefore, make a number of conclusions. First, there are fewer lecturers at PhD level than are required to spearhead research output. Second, the university does not allocate at least 3% of its budget to research activities. Third, the teaching policy does not reflect the time lecturers spend on research activities when calculating workload. Fourth, the university does not have adequate computers and computing software to carry out big simulations, computing and data analysis. Fifth, the university does not provide institutional or departmental support for research initiatives that are key to the improvement of research output at any given university.

The study further discovered that some institutional factors play a great role in enhancing research output and the university ranking. These include adequate teaching and research time, a reliable time schedule for research activities, encouraging staff attendance of professional research development activities both within and outside the university, and building research infrastructural facilities such as research laboratories, research teams and research institutes.

Finally, the study concludes that following and implementing the BUR Model would increase research productivity in public and private universities in Uganda, in particular, Busitema University. There is a need to motivate academic staff to fully embrace research activities so as to increase research output and improve rankings. Building industrial partnerships and collaborations highly contribute towards research and development activities. The allocation of adequate time for research activities in the university is paramount in increasing research output and improving ranking. Supporting collaborations in terms of research teams builds confidence and mentorship for research output. Providing sustainable support and coordinating academic staff development initiatives as well as allowing access to sufficient research information, both internally and externally, play a significant role in building research capacity and output, thereby increasing the visibility of the university.

The study recommends that the Government of Uganda as well as the stakeholders in both public and private universities should double their efforts in sourcing for and allocating grants to finance research and development projects. This can be achieved through establishing partnerships and collaborations with the responsible ministries, higher education supervising bodies like the National Council for Higher Education (NCHE), the Inter-University Council of East Africa, University Councils of the respective public and private universities within Uganda, non-governmental agencies that deal with cross-cutting issues, professional bodies and institutions like banks, industries and donors so as to influence research and the socio-economic development of the nation. Busitema University should come up with published and operational policies which adequately remunerate researchers as well as increasing their respective budget allocation to fully equip libraries and laboratories, fund research projects and procure modern equipment, supercomputers and any other material or equipment that can support research output by both graduate students and academic staff.

The study also recommends that the university should develop clear policies on teaching, research and innovation that enable staff to attend local and international conferences and workshops as a means to build their research capacity and to mentor them. The policies would act as a stimulus to enhance the research agenda in the institutions, hence boosting research output and university ranking.

The study further recommends that universities should motivate academic staff to adopt a new culture on research, conference participation and publication to increase research output of the institutions. This can be achieved through the establishment of modern research infrastructure to transform the universities into research-oriented institutions, conducting capacity training and mentorship programmes for the academic staff and implementing policies that will compel academic staff members to treat research activities as the only means to steer the socio-development and transformation of the nation and the world at large.

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Conflict of Interest

The authors declare that there is no conflict of interest pertaining to the publication of this work.

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Appendix A (Guidelines used to generate the Google Online Survey tool)

Table 1. The effects of the quality of academic staff on research output at the university.
A = Natural Sciences, **B** = Engineering, **C** = Technology, **D** = Health Sciences, **E** = Natural Sciences

Q_i = Quality of Academic Staff A		**Department/Faculty**									
		%	B	%	C	%	D	%	E	%	
Busitema University has a few lecturers with at least a PhD to spearhead research output	Assis. Lecturer										
	Lecturer										
	Sen. Lecturer										
	Assoc. Prof.										
	Prof.										
The remuneration/facilitation of teaching staff at the university is not attractive enough to encourage academic staff to actively engage in research and innovation activities											
The university has limited access to technology equipment and internet resources to support research activities											
The university does not allocate a mandatory (3%) percentage of its total budget to support research and innovation activities											
The teaching policy at the university does not consider the time lecturers should spend on research and innovation activities when calculating the workload											
The university does not have enough computers and computer software resources for computing, simulations and advanced data analysis											
The university does not have internal collaborative initiative as staff research teams											
The university does not provide adequate departmental support to coordinate research initiatives											

Table 2. The scale of research effort in terms of funding and time on research output at the university. **A** = Natural Sciences, **B** = Engineering, **C** = Technology, **D** = Health Sciences, **E** = Natural Sciences

R_i = Funding Research and Innovation	University									
	A	%	B	%	C	%	D	%	E	%
The university provides adequate teaching and research funds and time to influence research output										
There is effective use of consultation time and funds to meet the students by academic staff members at the university										
The university has an institutional management system of reliable time schedules for research and innovation activities										
The university dedicates time and funds to seminars, workshops and training in research and innovation activities										
The university facilitates academic staff to attend professional research, innovation and development activities both within and outside the university										
The university supports the use of email and internet services to provide feedback on matters concerning research and innovation initiatives										
The university encourages all ages and gender of academic staff in influencing research output of the institution										
The university provides sound policies to support research and innovation activities										
The university facilitates the development of research infrastructural facilities such as research laboratories, research agenda, research teams and research directorates										

Table 3. The effect of industrial partnerships and collaborations on the perceived university rankings and research output at the university.
A = Natural Sciences, **B** = Engineering, **C** = Technology, **D** = Health Sciences, **E** = Natural Sciences

L_i = Partnerships and Collaborations	University									
	A	%	B	%	C	%	D	%	E	%
Availability of adequate library facilities at the university										
Availability of adequate internet services at the university										
The university builds a positive attitude of the academic staff towards full engagement in research and innovation activities										
The university contributes towards building a culture of collaborative research and innovation activities										
The university gives support towards qualification influence of academic staff involvement in research and innovation										
The university allocates adequate time and funds to support research and innovation output										
The university established partnerships and collaborations with other institutions in promoting research and innovation teams										
The university builds research and innovation teams to increase publication										
The university has clear guidelines and a clear institutional policy on rewarding research and innovation output										
The university has clear procedures for timely submission of research progress reports										
The university promotes the sustainable support and coordination of staff development initiatives										
The university makes available all the necessary research information, funding opportunities and authorisation for external research and innovations										

University Sustainable Development and Management of Academic Staff in Higher Institution of Learning in Central Uganda

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Abstract

The study aimed at university sustainability development and the management of academic staff in Uganda. The sample comprised 80 respondents, including the teachers, heads of department and top managers in the universities. Data was analysed using one-way ANOVA by way of Excel statistical data analysis. Qualitative data was analysed using descriptions in themes deciphered in the course of the study. The majority of the academic staff lacked adequate knowledge about what was required of them in connection with university sustainability development. There was a significant relationship between university sustainability development and the management of academic staff in Uganda. It was concluded that many universities do not promote cross-campus collaborations that connect campus administration and students, which has resulted in inadequacy of funds to sufficiently train and manage staff. The study concluded that the majority of universities are still young in their sustainability effort of fully engaging the academic staff in a number of planned activities. It was also concluded that the majority of the academic staff are hesitant to get involved in university sustainability development due to lack of equity accorded to some of the staff. There is need to strengthen training of the academic staff in all areas that the universities feel are appropriate in order to greatly maintain and boost its sustainability development. There is also need to encourage a bottom-top approach for effective and sufficient communication and to provide appropriate and well-informed criteria to everyone on the mechanism used to reward the best academic staff as a way of increasing the positive impact of university sustainability development.

Keywords: *University sustainable development; Management of academic staff; Higher institution of learning; Uganda.*

Introduction

According to the Ministry of Education and Sports in Uganda (2020) and Pham (2021), university sustainability development (USD) and the management of academic staff in higher education institutions aim at identifying the level of importance given to desired competences in sustainable development among teaching staff at a number of higher education institutions. They add that all universities in Uganda aim at imparting education for sustainable development (ESD), with their major purpose being to equip learners across all disciplines with the knowledge, skills, attributes and values required to pursue sustainable visions of the future. Gamage (2022) contends that in order to sustain university development and manage academic staff, higher education institutions need to implement sustainability goals in their curricula and provide comprehensive guidance to educators, researchers and practitioners.

According to Longhurst (2022), if we, as educators in higher institutions of learning, are serious about preparing our students for the future, we must embrace university sustainable development and manage academic staff accordingly. This would ensure that every graduate has not only the knowledge and skills but also the attributes that will enable them at least to cope and ideally thrive in the face of the multiple challenges they will face in the course of their lives in the 21st century. Magdalene (2008) and Walter (2021) add that university sustainable development equips learners across all disciplines with the knowledge, skills, attributes and values required to pursue sustainable visions of the future. Using active pedagogies, learners are supported in addressing complex or 'wicked' problems and identifying how they can contribute to solutions that address environmental integrity, social justice and economic prosperity. Mthokozisi (2019) contends that in order for universities to have sustainable development and manage academic staff, it is very important to take into consideration student and academic staff activism because they have an important role to play in achieving the sustainable development goals of any university. He adds that throughout the world, academic staff and student activism has been a feature of higher education and for post-independence, African students have engaged in a second liberation struggle for social justice and democracy, he points out that in Asia, since the Second World War, students have organised protests on behalf of the academic staff, showing dissatisfaction with the way universities operate and that this has led to movements that have toppled authoritarian regimes in some countries and threatened governments that practise unfairness in the area of social justice and democracy in the universities. He adds that in Latin America, students organised and participated in the 1918 Cordoba Reform protest movement that swept across the entire continent to bring about changes in university governance. Subsequently, student inclusion in university governance in African, Asian and Latin American countries was institutionalised in public universities. Nevertheless, student activism continues to be prevalent as student activists continue to organise to defend and extend their gains with the help of their lecturers.

Globally, the UN (2021) has mapped the road to sustainable development by providing the framework, targets and indicators. Teachers in general have a role in utilising their creative ideas, technologies and inter-connectedness to bring innovative ideas to the fore to achieve the university sustainability development, but this seems not to be followed. In Africa, the trend of university sustainability development and management of academic staff indicates that today, sustaining universities and managing academic staff is becoming a serious issue due to the fact that of late many African students have participated in strikes that show dissatisfaction with the services that are offered in the universities. For example, the Africa Students' and Youth Summit 2018 (ASYS) that

attracted thousands of students and youth to Kigali, Rwanda in 2018 had a focus on the sustainable development of universities and the African Union Agenda 2063.

In Uganda today, and mainly due to the increasing demand for university education, the number of those seeking admission to universities is increasing every year. On the other hand, the capacity of universities to provide quality education to the increasing numbers of students is not growing as fast. This has led to some universities failing to sustain their development and effectively manage the academic staff, especially in terms of providing the needed facilities (Kasozi, 2009). To put this in context and according to Enwaru (2022), university sustainable development and management of academic staff have mainly been due to the fact that managers in universities have parallel coordination in the way they manage issues. This has contributed greatly to the breakdown in cordial relationships between students, academic staff and administration, and given rise to unmet needs due to the scarcity of resources and poor conditions in the institutions, among other factors. Enwaru adds that there are major points that need not be ignored by stakeholders in universities. These include abrupt increments in tuition fees and other charges that are seemingly unfair to the students, lecturers refusing to conduct lecturers as they protest delays in salary payments or as they strike over low pay, provision of poor services by universities to both students and staff. For example, some structures are dilapidated, some universities do not provide food to the lecturers despite their low pay, students are given inadequate food, failure by arrogant lecturers to provide marks in time, scrapping of some courses and merging others without consulting all stakeholders, and failure by the bursar's office to provide the right professional opinion about the financial status of the universities since some operate at a loss. This has made it very hard for the universities to sustain their development and manage academic staff. Kasozi (2009) and the United Nations (UN, 2017d), point out that the ugly face of poor salaries is made more awful by the high taxes and this leads to many universities using a big number of part-time staff, many of whom end up doing partial teaching and assessment as they crisscross the city and/or country moonlighting. Kasozi adds that many universities also do not have resources to undertake large-scale and effective staff development programmes, which has resulted in brain drain, leading to shortage of academic staff both in public and private universities. This is because the government is not funding higher education adequately and the fees that students pay fall far short of the realistic unit costs, public universities depend on government subventions and private universities on students' fees, and the availability of donor funds is very much limited and restricted. This poor funding has made it very hard for the universities to adequately sustain development and manage academic staff for competence assessment (Dodds, Donoghue, & Roesch, 2017). Sugumar (2003) contends that universities are failing to sustain their development and manage quality academic staff owing to their inability to manage their budgets, which has led to retrenchment and downsizing of the competent academic staff, which has resulted in poor performance by the universities. Mariappanadar (2003) and Pederson (2017) point out that universities' unsustainability is due to the failure to implement the plans and decisions that agreed after meetings at the different levels of management. They add that universities are failing to sustain development and manage staff due to the heavy teaching loads, undertaking of limited research, inadequate supervision of students, works and projects, listening to rumours, poor decision-making by the top managers and failure to undertake community-based activities. This has made it very hard for the universities to operate sustainably.

According to Hakki (2021), many universities have failed to sustainably manage their development and academic staff due to failure to develop curriculums and review their programmes

in line with societal needs. As a result, some of the taught programmes do not match the current and future demands of learners and, therefore, the graduates of such universities face the challenge of low demand on the job market. He adds that with the emergence of the digital age, teaching and learning has been fundamentally transformed, yet our universities lack adequate pedagogies involving teaching online and are hampered by a serious shortage of ICT equipment, facilities and capabilities such as computers, electronic resources, internet connectivity with sufficient bandwidth and ICT-compliant staff. Male (2011) contends that in Uganda today, a number of strikes have cropped up in universities owing to the inadequacy of funds to finance research development projects and support the teaching staff to upgrade, as well as failure to hold workshops as a way to sustain development and manage staff. He adds that some of the universities frequently use threats, such as that of terminating staff from jobs, and that this has, in many cases, demoralised the academic staff, negatively impacting performance, writing grant proposals, publishing and carrying out competence assessment of all the development activities. This has greatly reduced efforts by the academic staff to think and contribute to the development of universities since they are worried about job security. This research, therefore, investigated the sustainable development and management of academic staff at universities in Central Uganda.

Methodology

Design

This study used a descriptive cross-section survey design that employed both qualitative and quantitative approaches. As suggested by Amin et al. (2005), these approaches were preferred because they combine the benefits deriving from the diversity of the multiple realities one finds in more complex field situations while also taking into consideration representative sampling.

The population size

The main target respondents were higher education teachers. The universities that were considered were four, i.e. two government universities and two private universities located in four districts in Central Uganda. The target population for the teachers was 80. Both the universities and central districts were randomly selected and a representative sample was obtained using Krejcie and Morgan's sample table (1970).

Sampling

Purposive sampling was used to select a sample of four universities, each located in a separate district, with two being private and two public, because the country has a big number of universities, i.e. forty-three. Convenience sampling was used to select the urban and rural districts within Central Uganda where the four universities were situated.This sample was considered appropriate, in line with Gay's, (1996, p. 126) recommendations, which stated that the sample saves time and enables the researcher to carry out his or her work without waiting for those who are not around at the time of the study. The answers from such sub-groups proved to be more motivating or more interested in the study, thus generalizing the target population with caution (Amin 2005, pg., 242).

A simple random sampling procedure was used to select a sample of 20 academic staff from each of the four universities.

Purposive sampling was used to select academic staff, heads of department and some top managers from each university to provide reliable and valid information.

Procedure

Data collection and analysis involved a synthesis of all ideas obtained from both primary and secondary sources. The study specifically involved the use of survey, focus group discussion (FGD) and interviewing methods, purposively to select the respondents. These laid the ground for a reflection on university sustainable development and staff management in Central Uganda. A total of 80 questionnaires for the academic staff were returned, a response rate of 100%. These methods were selected because they are time-saving, records can be kept for future use, and so that the purposively and randomly selected respondents could be interviewed.

Results and Discussion

Data on university sustainable development and management of academic staff in connection with assessing the competencies present at universities was based on reaching out to the respective respondents in the respective universities in order to assess their competencies.

Ways institution consider to ensure an environmentally conscious staff workplace

The study investigated the ways institutions consider to ensure an environmentally conscious workplace for staff in a higher institution of learning.

In this study, ensuring an environmentally conscious staff workplace was understood to mean having policies and programmes in place that encourage green behaviour (behaviour that minimises harm to the environment as much as possible, or even benefits it) amongst the academic staff so that they can act for the sake of nature and can put others ahead of themselves. This goes beyond just having in place policies and programmes but putting into practice all that is agreed upon by the institutional managers through the institution of eco-friendly policies that help to contribute to helping the universities to develop sustainably and enable them to manage their academic staff.

With regard to ensuring an environmentally conscious staff workplace, the teachers in higher education institutions were asked to tick appropriately in the questionnaire ways which the universities had created to manage their employment in the workplace. Their responses are summarised in the table below.

Table 1: Teachers' opinions of the areas in which higher institutions of learning have ensured the environmentally conscious workplace. (Tick appropriately)

Items	Teacher's perception of the level of disagreement	Freq.	Percent
Formulate eco-friendly policies that do motivate the academic staff in the workplace	Strongly agree	38	48.0%
	Disagree	42	52.0%%
Institutions always measure the performance of academic staff regularly	Strongly agree	51	64.0%%
		29	36.0%%
Universities always arrange regular meetings with all academic staff on matters concerning the university operations	Strongly agree	28	35.0%
	Disagree	52	65.0%
The set goals are clearly followed	Strongly agree	42	52.0%%
	Disagree	38	48.0%%
Reward hard work by paying emoluments in time as agreed in staff appointment	Strongly agree	38	48.0%
	Disagree	42	52.0%

Items	Teacher's perception of the level of disagreement	Freq.	Percent
Ensure that employees enjoy working by providing them with teaching and assessment materials during the teaching and learning process	Strongly agree	48	60.0%
	Disagree	32	40.0%
Encourage communication through teamwork	Strongly agree	42	52.0%
	Disagree	38	48.0%
The university communicates directly and transparently	Strongly agree	36	45.0%
	Disagree	44	55.0%
Provide constructive feedback and recognition	Strongly agree	23	29.0%
	Disagree	57	71.0%%
Assign tasks to academic staff based on skill, experience and competency	Strongly agree	32	40.0%
	Disagree	48	60.0%
All academic staff have overcome the challenges of online teaching and assessment of the learners	Strongly agree	56	70.0%
	Disagree	24	30.0%
Provide heathier food and breakfast to staff	Strongly agree	38	48.0%
	Disagree	26	32.0%
Facilitate community service opportunities	Strongly agree	29	36.0%
	Disagree	51	64.0%
Exposed to research training and publications	Strongly agree	18	23.0%
	Disagree	62	77.0%

Source: Field study

The results in Table 1 above indicate that the majority of the academic staff in higher institutions of learning ensured that there was an environmentally conscious workplace in a number of areas. The staff at the institutions concerned affirmed that the institutions always measured the performance of academic staff regularly by strongly agreeing, at 64.0%; 52.0 % of the staff in some of the institutions strongly agreed that the set goals were closely followed; 60.0% agreed that the institutions did not provide the necessary teaching and learning materials, which would make the academic staff enjoy teaching and assessing the learners; 52.0% agreed that communication was encouraged through teams and, finally, 70.0% of the academic staff attested that they had overcome the challenge of teaching and assessment using online platforms. From the findings, it can be noted that the majority of the universities in Uganda still have challenges in areas like facilitating community outreach activities, have academic staff with inadequate exposure to research training and publications, have staff some of whom are deployed when they have inadequate skills due to lack of workshops, reward their workers inadequately, and rarely provide constructive feedback and recognition. All these are evidenced by the low percentages, which indicate some limitations that prohibit the universities from developing sustainably and managing their academic staff as per the required standards.

During oral interviews, the teachers revealed that there were still difficulties around ensuring an environmentally conscious workplace because some universities still faced inadequate instructional materials, inadequate training of teachers to handle environmental education-related topics in their subject areas and over-reliance on the lecture method of teaching, among others.

One lecturer responded that "many university managers believe that one to teach, he or she must be in the lecture room always to ensure that there is teaching and learning of the students, which exposes them to rote learning" (interview, August 2022).

It was also revealed through FDGs that some universities, instead of making attempts to improve the situation when academic staff complained of failure to pay their salaries in time, instead resorted to using intimidating language connected to termination of service, which leads to some staff looking for greener pastures elsewhere. They also reported that some universities had programmes that did not help the communities, which made it impossible for those programmes provide enough funds for development. This meant that the academic staff were facing some problems at the workplace which, in turn, constrained the universities' ability to sustainably develop and be effectively supported by their staff. When the data was tested that relates to the academic staff and ensuring an environmentally conscious workplace for staff, the two were found to be positively significant.

Table 2: ANOVA results on teachers' opinions of the areas in which higher institutions of learning have ensured the environmentally conscious workplace

Groups	Count	Sum	Average	Variance
Strongly Agree	14	519	37.07143	112.2253
disagree	14	585	41.78571	132.7967

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	155.5714	1	155.5714	1.269857	0.270087	4.225201
Within Groups	3185.286	26	122.511			
Total	**3340.857**	**27**				

When the above was subjected to one-way ANOVA, it was found that there was no significant difference (P>05) between the academic staff and the environmentally conscious workplace provided by universities. This meant that the academic staff in universities have a significant positive influence at their workplaces.

Academic staff involvement in sustainability development for competence assessment

The study investigated the involvement of academic staff in sustainability development and management for competence assessment.

In this study, academic staff sustainability development means the related approach chosen to calculate positive sustainability development contributions, for example designating champions and creating a green team, inviting suggestions and observations, holding consistent meetings, participating in local initiatives, communicating results and general news, including a section in the employee handbook, among others. This, in the end, helps to unite academic staff in any institution to create a better work culture and work-life balance that boost competence assessment without compromising the ability of future generations. Therefore, when university managers put into practice all the above, it can greatly help to contribute to helping the academic staff get fully involved in universities' sustainability development for competence assessment.

On ensuring academic staff involvement in sustainability development for competence assessment in areas like preparing self-assessment reports, putting staff in real-life situations, giving the team tasks to play, among others, the teachers in higher education institutions were asked in

the questionnaire to tick appropriately the ways in which the universities had involved them in contributing towards sustainability development for competence assessment. Their responses are summarised in Table 3 below:

Table 3: Academic staff's opinions on the areas that they have been involved in the universities for sustainable development for competence assessment. (Tick appropriately)

Items	Teacher's perception of the level of disagreement	Freq.	Percent
Take a top-down approach always	Strongly agree	38	36.0%
	Disagree	42	64.0%
Create a sustainability committee	Strongly agree	34	39.0%
	Disagree	46	61.0%
Offer green-commuting incentives	Strongly agree	28	21.0%
	Disagree	52	79.0%
Always encourage feedback to staff	Strongly agree	42	43.0%
	Disagree	38	57.0%
Promote sustainability initiatives	Strongly agree	23	29.0%
	Disagree	57	71.0%
Emphasise environmental protection	Strongly agree	38	35.0%
	Disagree	42	65.0%
Staff training workshops on writing papers for publication	Strongly agree	48	30.0%
	Disagree	32	80.0%
Staff training workshop on new methods	Strongly agree	42	46.0%
	Disagree	38	54.0%
Manage conflict and create win-win situations for academic staff through organised retreats	Strongly agree	36	21.0%
	Disagree	44	79.0%
Effective communication between managers and academic staff	Strongly agree	44	79.0%
	Disagree	36	21.0%
Strongly involved in teamwork activities	Strongly agree	48	60.0%
	Disagree	32	40.0%
Opportunity to exchange ideas with other staff in other universities	Strongly agree	46	58.0%
	Disagree	34	43.0%
Delegation top to bottom staff	Strongly agree	38	47.0%
	Disagree	42	53.0%
Developing and writing programmes in the university	Strongly agree	39	49.0%
	Disagree	41	51.0%

Source: Field study

Data in the Table 3 reveals that the majority of academic staff (79.0%) got effective communication between managers and staff, 60.0% of the academic staff were strongly involved in teamwork activities, and that 58.0% enjoyed the opportunity to exchange ideas with other staff in other universities. However, developing and writing programmes (49.0%), delegation by top staff to

bottom staff (47.0%), managing conflicts between staff (21.0%), staff training workshops on new methods (46.0%), involvement in writing papers for publication (48.0%), emphasising environmental protection (38.0%), offering green community incentives (28.0%), using a bottom-top approach (38.0%) and creating a sustainability committee at all levels (34.0%) were still problematic.

The revelations were supplemented by the results of the interviews and FGDs, where the majority of the teachers reported that they still faced a major problem of competing priorities among managers who had to juggle the need for profit and growth, the environment and human capital, poverty and exclusion, underpayment of salaries, building strong institutions and supporting the rule of law, and limited land to develop sustainable activities. Some of the academic staff interviewed reported that they did not know the criteria the managers in universities used to recognise some of their colleagues for performing beyond the supervisor's expectations in sustainability activities. They also added that sometimes universities were reluctant to increase awareness, and that they rarely developed sustainability development programmes with community participation. Furthermore, some responded that there was lack of coordination between staff, inadequate incentive-based practices and inadequate resources. Others responded that some academic staff at the bottom had good ideas pertaining to developing programmes but were never involved in the meetings. And yet others also reported that they lacked knowledge of writing grant proposals and how to publish.

This revelation was corroborated by FGDs of academic staff where it was attested:

> The management of universities set rules without consulting the academic staff which has led to resistance, lack of commitment, pessimism and negativity to perform tasks at hand. (Interview, August 2022)

This also supports the above response from the FGDs where the reason the reason for their sometimes not getting involved in the university sustainability development was reported:

> Some managers in universities always focus at pinning academic staff with complaints than focusing on solutions and always tend to assume that they do have all the answers to all solutions, which has failed to build a strong team for development. (Interview, August 2022)

When the data was tested using one-way ANOVA, between academic staff and their involvement in the universities for sustainable development for competence assessment, the two were found to be positively significant (see Table 4).

Table 4: ANOVA results on academic staff involvement in universities sustainability development for competence assessment

Groups	Count	Sum	Average	Variance
38	13	488	37.53846	60.26923
42	13	532	40.92308	92.57692
	0	0	DIV/0!	DIV/0!

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	74.46154	2	37.23077	0.466868	0.632775	3.422132
Within Groups	1834.154	23	79.74582			
Total	1908.615	25				

From the study findings, it was concluded that the majority of the academic staff still suffered low self-esteem so were not prepared to get involved in universities' sustainable development for competence assessment. In that respect, Table 4 indicates that there was no significant difference (P>05) among the academic staff. This means that academic staff involvement in universities has a significant positive influence on boosting the university sustainable development.

Impact of academic staff on sustainability development and management of universities growth

The study investigated the impact of academic staff sustainability development and management of university growth.

In this study, the impact of academic staff sustainability for development and management of university growth was understood to mean the current and future ability of workers to remain in the workforce, and this is determined by a healthy organisation culture that supports and values academic staff. Management of university growth, on the other hand, means the effort needed to encourage development for conducting, monitoring and analysing the complex activities of the university such as centralised admission, centralised examination and much more.

Regarding ensuring the impact of academic staff sustainability for development and management of university growth, the lecturers in higher education institutions were asked in the questionnaire to tick appropriately. The responses are summarised in Table 4 below.

Table 5: Academic staff's opinions and their impact on sustainability development and management on universities growth. (Tick appropriately)

Items	Teacher's perception of the level of disagreement	Freq.	Percent
Increased competence assessment due Job security	Strongly Agree	39	49.0%
	Disagree	41	51.0%
Inclusion (professional growth and development is actively taken into consideration)	Strongly Agree	34	33.0%
	Disagree	46	67.0%
Been able to write grant proposals to boost the sustainability development	Strongly Agree	39	21.0%
	Disagree	41	79.0%
Prudence through research symposium	Strongly Agree	42	19.0%
	Disagree	38	81.0%
Equity in decision-making for all employees	Strongly Agree	35	44.0%
	Disagree	45	56.0%
Participate in sustainability report as a whole	Strongly Agree	48	20.0%
	Disagree	32	80.0%
Undertaking innovative initiatives in a knowledge-based society	Strongly Agree	36	45.0%
	Disagree	44	55.0%
Often participate in socio-economic development	Strongly Agree	39	59.0%
	Disagree	47	41.0%
Participated in maintenance of the environment	Strongly Agree	45	56.0%
	Disagree	35	44.0%
Get time to research and publish every semester	Strongly Agree	34	43.0%
	Disagree	46	57.0%

Items	Teacher's perception of the level of disagreement	Freq.	Percent
Actively participate in community-based activities	Strongly Agree	46	57.0%
	Disagree	34	43.0%
Been able to deliver skills as expected in the university	Strongly Agree	38	48.0%
	Disagree	42	52.0%
Been able to teach learners online without hardships, both physical and online	Strongly Agree	39	49.0%
	Disagree	41	51.0%
Competent in conducting research supervision for learners	Strongly Agree	36	45.0%
	Disagree	44	55.0%

Source: Field study

The results in Table 5 indicate that regarding the impact of academic involvement on sustainability development and management of universities' growth, the majority of the academic staff had often participated in socio-economic development, 59.0% had actively participated in community-based activities, 53.0% had developed prudence through research symposiums and half of the workers had enhanced their competence assessment due to job security. However, the percentages for the rest of the items were below the half-way mark. These include the provision of competent knowledge in research supervision for learners (45.0%), ability to effectively teach online (49.0%), participation in delivering the skills obtained through training at the university (48.0%), finding time to do research and publish every semester (43.0%), undertaking innovative initiatives (45.0%), participating in decision-making equally (44.0%), being interested in professional growth (33.0%) and being able to write proposals for grants to supplement the university's income (21.0%). This showed that there is need to motivate the academic staff towards university sustainability development and growth.

During the FGD, the academic staff revealed that the most demotivating factor in the universities was failure to pay their salaries in time. They also revealed that universities did not want to facilitate people who might want to upgrade. They revealed that some universities resource-constrained, which limited opportunities for research in some instances. They also reported that some trainers of academic staff seemed to have inadequate knowledge of what they trained the staff about, so that in the end there was still a shortfall in achieving sustainable development in the university.

The structured interviews revealed that the academic staff is frightened by the lack of job security, which hampered them from doing their best to contribute to sustainable development for university growth. They also reported that they were overloaded with course units, which made it hard to have more ambitious plans for the university, especially in terms of developing programmes, publishing and undertaking innovative research.

One lecturer reported that "universities are failing to sustainably develop for their growth due to very small salaries that have made many lecturers to part [moonlight] from one university to another. This has made it very hard for the people to settle and plan well in their mother universities' (interview, August 2022).

When the data was subjected to one-way ANOVA, it was found that there was no significant difference (P>05) among the academic staff in the universities under study regarding their sustainability development and growth.

This meant that the academic staff in the different universities had a similar impact on university development and growth (See Table 6 below).

Table 6: ANOVA results on academic staff and their impact on university sustainability development and growth

Groups	Sum	Average	Variance
Strongly Agree	550	39.28571	19.91209
disagree	576	41.14286	22.74725

ANOVA

Source of Variation	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1	24.14286	1.131891	0.297154	4.225201
Within Groups	26	21.32967			
Total	27				

There is a strong positive relationship between academic staff and university sustainability development regarding their growth because the (P>0.05), hence there is a statistically significant between the two, i.e. the impact of academic staff on university sustainability development and growth.

Conclusions

From the study findings, it was concluded that the majority of the academic staff seemed not to fully engage in activities that boost sustainable development in the universities as far as providing the sustainability reports to the staff was concerned. Some universities did not facilitate participation in community-based activities, or provide money to encourage the staff to upgrade. Some used trainers who lacked the appropriate knowledge to train the academic staff adequately. Also, some universities failed to pay the agreed emoluments as per the appointment letters. Furthermore, some academic staff tended to be overloaded with course units, which led to failure by academic staff to perform adequately and plan for university sustainability as far as carrying out research is concerned. All these made it very hard to adequately manage the academic staff owing to failure to boost equity in all areas, and this has caused imbalances in both economic and social stability. University sustainability development and management of academic staff have a significant positive influence on the universities' existence and create a balance in both the social and economic wellbeing of the employees for competence assessment.

Recommendations

Following the discussion of the results and conclusions reached, the researchers wish to make the following recommendations.

There is need for the universities to consistently equip the academic staff with the right knowledge, specifically knowledge related to both why an action is important and how to do it. There is need for universities to help the academic staff absorb ideas and make decisions in specific ways; for example, the staff are moved more by positive messages than messages of gloom and doom. There is also need for the universities to make actions easy to undertake and enjoyable by emphasising the provision of practical support to academic staff. There is need for NCHE to encourage workshops that train managers in higher institutions of learning about the need to foster sustainable development

and manage their academic staff. This can help to keep the benchmarked policies on track. There is also need for NCHE to get involved in the process of developing the proposed programmes by the technical people in the universities as a way to ensure that the programmes suit the communities' needs. In this way, the universities will gain access to resources that will ensure that they operate effectively and manage the academic staff competently. There is need for university managers to provide effective and consistent rewards to staff as these tend to retain staff, ensure sustainability development and foster competence assessment.

Limitations of the Study

Since the position of the research study was mainly quantitative in nature, it was very expensive and time-consuming since it involved reviews during certain periods to collect the data.

Future Research Recommendations

The study recommends that a further study should be carried out in the following area:

Thoughts on good managerial skills and its effectiveness in university sustainable development.

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Information Communication Technologies and Implementation of Education for Sustainable Development in Higher Education in Uganda: A case of Busitema University

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Abstract

Information and Communications Technologies (ICTs) play an important role in Education for Sustainable Development (ESD), one of the multiple approaches advanced in the last two decades to address the global sustainability crisis. The role of higher education, especially as a main driver of change, in ameliorating the immense sustainability challenges is widely acknowledged. Educators in higher education institutions must strategically engage in profound transformative programmatic, pedagogical and organisational shifts in order to play this role. ICTs are important in enabling educators to make the necessary modifications to effectively promote themes, skills, knowledge, values and attitudes in learners that will foster sustainable development. This study adopted a concurrent mixed strategy to investigate the use of ICT in the implementation of ESD practices by academic staff of Busitema University in Uganda. It sought to find out the dominant ICT activities that staff used for implementing particular ESD practices. The sample consisted of 134 academic staff and students selected using simple random and purposive sampling. The study employed a questionnaire, interview and focus group guides as primary data collection instruments. The results point to a low level of ICT use, with the dominant ICT activities being of communication and sharing

information, information creation and management, which did not add much value to the educational experiences of the learners in ESD. The study recommends staff training in ICT skills to address the challenge that comes with the use of new digital technologies, addressing the issues of access to ICTs and internet infrastructure.

Keywords: *Information and Communications Technologies (ICTs); Sustainable development; Education for Sustainable Development (ESD); Higher education*

Introduction

The world grapples with immense sustainability challenges of social, economic and environmental dimensions. Scientists have blamed the crisis largely on unsustainable patterns of consumption and production; and lack of sustainable basic education (Li et al., 2019). Many approaches have been suggested for addressing the global crisis. At the centre of the approaches is the need for a shift of consciousness through education, termed Education for Sustainable Development (ESD), which has been advanced in the last two decades. All forms and all levels of education have important roles. However, the role of higher education, especially as main drivers of change in addressing the immense sustainability challenges plaguing the world, is widely acknowledged. Educators in higher education institutions must strategically engage in profound transformative programmatic, pedagogical and organisational shifts in order to play this role. Thus, ESD requires that educators modify existing pedagogical methods to maximise their effectiveness in promoting critical consciousness, and they can achieve this by making use of ICT (Makrakis, 2014). ICTs have become a major driving force shaping educational change and have an important role in achieving the UN's Agenda 2030.

According to Adarkwah (2021), ICTs are a means to achieve SDG 4 and a platform for communication of the SDGS. They are important in enabling educators to make the necessary modifications to effectively promote themes, skills, knowledge, values and attitudes in learners that will foster sustainable development. There is agreement that ICTs, especially digital ones, are essential in facilitating practices of ESD and enabling education to exploit its transformative potential for sustainable development. When combined with existing pedagogies and social contexts, ICTs, especially digital technologies, can constitute strong drivers of transformation of learners' behaviours for sustainability. Thus, planning with technologies is an essential part of a whole system approach to the integration of ESD into practices of higher education institutions (Moodly & Adu, 2017).

Literature Review

Both old and new technologies are essential to the implementation of ESD. Research reveals that educators use ICTs as an innovative interactive tool to achieve different goals of ESD. ICTs provide great interactive tools for the benefit of ESD (Madani et al., 2017). Thus, the use of technology in ESD provides innovative approaches to teaching and learning sustainability, which interests the learners in the practice (Li et al., 2019). It also increases access to information and promotes new ways of interaction, thus acting as drivers of new pedagogical approaches (Meenashki, 2013). Meenashki further reveals that educators believed ICTs could be used to enhance learning and achievement among learners. ICTs are also used to support other pedagogical approaches for sustainability education. Waluyo (2019) reports the facilitative role of ICTs as a pedagogical support during teaching and learning and in helping to improve learners' achievement. He concluded that ICTs create an

opportunity to use a variety of pedagogical approaches and support facilitative, collaborative and interactive approaches that lead to transformative learning.

Similarly, Makrakis and Kostoulas-Makrakis (2012) report the use of ICTs as transformative tools in sustainability education. Sustainability scholars agree with the transformative role of ICTs. Makrakis (2014), for instance, explains that ICTs enable the construction of meaningful learning environments for sustainability by promoting processes that engage and challenge learners to explore, experience, discover, construct and reflect on sustainability themes, ideas and values. ICTs have also been used to help learners engage in problem-based learning. Li et al. (2019) assert that project-based learning and problem-solving strategies that are so much encouraged in the teaching and learning of ESD benefit greatly from the use of ICTs. The authors also found that academic staff used ICTs to connect classroom teaching to learners' interests, experiences and background, thus making them learn in more relevant ways. Researchers also link ICTs directly to skills and competence development. For instance, ICTs can be used to provide the much needed 21st century skills that can best enable learners to compete in a society driven by knowledge and information (Haji et al., 2017). Thus, they can promote (ESD) competences such as problem-solving, group decision-making and communication (Hong, 2016).

Other scholars have, however, contradicted the above findings. For instance, findings by Opati (2013) of a study set in the Makerere University College of Education showed that ICTs were used more in lecture preparation, record management and socialisation than in the teaching and learning process. Li et al. (2019) reported that educators in Mongolia primary schools used ICTs for storage and dissemination because they lacked ICT skills. Many teachers did not consider ICT use to be central to the teaching and learning process and were reluctant to use them (Meenashki, 2013). They also felt that using ICTs required the adoption of learner-centred approaches which, to them, consumed much time and energy.

The low levels of ICT adoption by academic staff stem from several factors, which include lack of knowledge, inadequate skills, limited resources and accessibility. Messina and Tabone (2012) indeed found low scores on teachers' knowledge of technology and how to connect technology, pedagogy and context. Limited knowledge of technology definitely limits the application of ICTs to the teaching and learning process, as well as to research and community engagement. Academic staff require new skills and competences in order to use the newer digital technologies for communication, creating digital content and solving technical digital problems (Rana, 2018). Li et al. (2019) confirm that educators need capacity-building if they are to progress from the basic use of ICTs to making them part of pedagogy. Without capacity-building in information literacy, academic staff may not make sufficient use of ICTs for the promotion of ESD. This speaks for other countries. What about the study context?

Studies reveal that educators in higher education have used ICTs extensively but

mainly for general rather than ESD-specific purposes. Moodly and Adu (2014) warn that the general use of ICTs does not add value to the educational experience of learners. Educators need to identify and use technology that adds value. Some of the findings are based on literature reviews and not empirical data. Moreover, most of the studies reviewed were conducted in developed and high-resource-based countries which are well-endowed with ICT resources, where staff and students possess high skills in technology use. The studies do not depict how academic staff in developing countries, whose institutions are challenged by inadequate ICT resources, make use of ICTs for ESD purposes. There is hardly any literature on how academic staff in Ugandan universities,

including Busitema, use ICTs in ESD practices. The mission of Busitema University, the context of the study, is to "provide high standard training, engage in quality research and outreach for societal transformation and sustainable development" (Busitema University, 2014). The mission sets the university on the path of ESD. This study was, therefore, important in investigating how academic staff of the university are using ICTs to fulfil part of the mission of the university.

Purpose/Objectives

The purpose of this study was to investigate the use of ICTs for the implementation of ESD by academic staff in Busitema University. The specific objectives were to:

1. Investigate the extent to which academic staff use different ICT activities to implement ESD practices in Busitema University.
2. Establish the challenges encountered by academic staff in using ICTs to implement ESD practices in Busitema University.

Conceptualising Key Terms

ICT stands for information and communications technology, and represents a variety of technological tools and resources used to communicate, and to create, disseminate, store and manage information (Meenaskshi, 2013). Luyombya (2012) explains that ICTs are instruments, devices or applications used in facilitating the communication, creation, processing, use or dissemination, storage, retrieval and transmission of information by electronic means. Estable (2011) and Makrakis and Koustoulas-Makrakis (2012) consider ICTs as both old and new technologies used in processing and communicating information. This study understands ICTs to mean old technologies and new digital devices and applications used to communicate, create process, disseminate, store, retrieve and manage information electronically.

Ferrari (2012) explains ICT use in terms of competences for the key ICT activities of information management, collaboration, communication and sharing, creation of content and knowledge, ethics and responsibility, evaluation and problem-solving and technical operations. This study considers ICT use to mean the employment of different technologies to facilitate the activities outlined by Ferrari (2012) for the implementation of ESD. Specifically, ICT use considers using ICT tools to promote activities such as problem-solving, information management, collaboration, communication and sharing, the creation of content and knowledge in the implementation of ESD.

The widely agreed upon definition of the term sustainable development is the one provided by the WCED report, commonly known as *Our Common Future*. The report defines sustainable development as "…development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p.43). The definition underscores the importance of understanding the intricate relationship between development and the environment (UNESCO, 2018); the relationship between a healthy economy and healthy environment; the principles of intergenerational and intra-generational equity; the significance of poverty eradication; and the limitations set by the carrying capacity of the environment (Arpita et al., 2018). The vision for sustainable development is currently enshrined in the SDGs that address a wide range of complex social, ecological and economic issues, which include poverty reduction, food security, climate change mitigation, quality education and the promotion of sustainable consumption (Albareda-Tiana et al., 2019).

The concept of ESD has a variety of meanings because of its ever-changing nature (Arpita et al., 2018; Nomura & Abe, 2010; Yiu, 2015). Most scholars agree that ESD is a means of achieving

Sustainable Development Goals (SDGs). Dannenberg and Gapentin (2016) posit that ESD is education that develops sustainability competences by incorporating issues of sustainable development into different aspects of education. It is thus "a process of integrating the principles and practices of sustainable development into all aspects of education and learning, to encourage changes in knowledge, values and attitudes with the vision of enabling a more sustainable and just society for all" (UNESCO, 2014, p. 5). Muller et al. (2021) define ESD as an educational programme that empowers people to think about the impact of their actions and make responsible decisions for a better future. According to UNESCO (2018), ESD provides a new vision of education that addresses the connections between complex sustainability issues, giving learners the opportunity to connect with nature. Similarly, according to Kedzierska et al. (2013), ESD is a strategy used for achieving the goal of sustainable development. Drawing upon the several understandings of ESD, this study considers ESD as an educational approach and strategy through which learners acquire knowledge and values, and develop skills and attitudes that will enable them to work and live in a way that safeguards the environment and the socio-economic wellbeing of society. Implementation of ESD in this study is denoted by different ESD practices, and these are incorporation of ESD into curriculum development, teaching and learning for ESD, ESD research, outreach for sustainable development, and sustainability in campus operations such as student sustainability clubs, waste reduction practices, water and energy conservation practices, sustainable landscaping and sustainability audits.

Methodology

This study adopted a parallel convergence mixed methods strategy that combines both quantitative and qualitative research approaches for full investigation of the research objectives. The study concerned itself with the exploration, interpretation, explanation and description of the use of ICTs in implementing ESD practices by academic staff in faculties of Busitema University. The target population of the study consisted of all full-time academic staff and undergraduate students in the faculties of Busitema University. By targeting full-time staff, the researcher wanted to capture respondents who were knowledgeable about all programmes of the university. The participants were representative of the different categories of academic staff so as to enable the researcher to capture the experience of the different levels of academic staff with ESD implementation. The inclusion of students was to ensure that the information gathered from the focus groups was used to substantiate data collected from other sources. The students were representatives of different programmes so as to bring voices from their different programmes of study to enrich the study findings. The study sample consisted of 140 academic staff, 15 ESD key persons and 48 students chosen from different programmes in six faculties. The study employed stratified sampling technique to divide the target population into different homogeneous strata, simple random sampling to select respondents from each stratum to complete the questionnaires and purposive sampling to select participants for interviews.

Data in the study was collected using survey questionnaires, interviews and focus group discussions (FGDs) as the primary data collection methods. A questionnaire was administered to faculty members to establish the extent of ESD implementation in the faculty. Interviews were carried out among deans and deputy deans of faculties and key persons working with ESD in the faculty. Focus group discussions were conducted for final year student groups selected from different programmes in order to cover a wide range of opinions. Document analysis was the only

secondary data collection method used to cross-check and complement the information obtained from the other data collection methods.

The quantitative data was sorted, processed and analysed using the Statistical Package for Social Sciences (SPSS). Data was analysed at the univariate level using descriptive analysis. The descriptive statistics in the form of frequencies and percentages were used to summarise and describe responses. The qualitative data was analysed manually. This started with content analysis and thereafter patterned coding was done to identify emerging themes as suggested by Percy et al (2015). The two datasets were triangulated at the time of reporting the findings and discussion.

Findings of the Study

The extent of use of ICT activities by academic staff in ESD practices

The first objective of the study was to establish the extent to which academic staff used ICTs for implementing ESD practices. It specifically sought to find out the extent to which academic staff used ICTs for information management, collaboration, communication and sharing information, the creation of content and knowledge, ethics and responsibility, evaluation and problem-solving and technical operations. The ESD practices were curriculum development and implementation, research and scholarship, outreach, and campus operations. Campus operation practices included student programmes, energy conservation and water conservation practices. Others were recycling of solid waste, sustainable landscaping, waste reduction and sustainability audits. Data was collected through both quantitative and qualitative methods. The survey section on the use of ICTs required respondents to indicate the ICT activities that they had commonly adopted for implementing various ESD practices. The scores for each ICT activity were summed up for each ESD practice. The results in percentages are presented in Table 1.

Table 1: The extent of using ICT activities for ESD practices

	ICT ACTIVITIES (%)						
ESD Practices	IM	CO	CS	CCK	ER	EPS	TO
Curriculum Implementation	66.3	48.1	72.1	64.4	18.3	23.1	36.5
Teaching and Learning	55.8	43.3	75.0	69.2	26.9	36.5	34.6
Research and Scholarship	64.4	63.5	66.3	53.8	44.2	37.5	29.8
Outreach and service	57.7	57.7	73.1	28.8	20.2	31.7	29.8
Student Programmes	41.3	31.7	56.7	17.3	14.4	18.3	17.3
Energy Conservation	32.7	16.3	45.2	17.3	10.6	20.2	16.3
Water Conservation	32.7	19.2	40.4	17.3	4.8	21.2	25.0
Sustainable Landscaping	37.5	21.2	38.5	24.0	8.7	22.1	21.2
Recycling of solid waste	32.7	19.2	20.2	20.2	13.5	21.2	20.2
Waste reduction Practices	44.2	23.1	33.7	19.2	12.5	19.2	22.1
Sustainability Audit	29.8	15.4	24.0	15.4	14.4	13.5	12.5

Note: IM = Information Management; CO = Collaboration; CS = Communication and Sharing; CCK = Creation of Content and Knowledge; ER = Ethics and Responsibility; EPS = Evaluation and Problem-solving; TO = Technical Operations

An overview of the results in Table 1 shows that the most dominant ICT activity across ESD practices was communication and sharing, followed by information management and the creation of content and knowledge. The use of ICTs was low for activities such as collaboration, evaluation and problem-solving, as well as technical operations, and least for ensuring ethics and responsibility. This observation regarding the dominance of certain ICT activities cuts across all ESD practices.

The findings on practices that fall directly under the roles of academic staff were as follows: The main use of ICT for curriculum implementation was communication and sharing, with 72.3% scores. This was followed by 66.3% for information management, and 64.4% for the creation of content and knowledge. About 48.1% respondents indicated that they had used ICTs for collaboration during curriculum implementation, while 36.5 had used it for technical operations, and 23.1% for evaluation and problem-solving. The lowest score of ICT use for curriculum implementation was in ethics and responsibility. Similar to curriculum implementation, communication and sharing emerged as the most frequently used ICT activity during teaching and learning, with 75.0% scores. This was followed by the creation of content and knowledge (69.2%), information management (55.8%) and collaboration (48.1%). Lower scores were observed for ICT use in the activities of evaluation and problem-solving (36.5%) as well as technical operations (34.6%), and the lowest being ethics and responsibility, with a score of only 26.9%. Analysis of the extent of using ICT activities for research and scholarship shows high scores for ICT use for communication and sharing (66.3%), followed closely by information management, collaboration, the creation of content and knowledge, ethics and responsibility, and evaluation and problem-solving, and the least used ICT activity was technical operations, with only 29.8% scores. Communication and sharing still had the highest score of 73.1% for ICT use in outreach and service, like in the other core ESD practices (see Table 1). ICT activities for information management and collaboration in outreach and service practices were each rated at 57.7%. This was followed by evaluation and problem-solving at 31.7%, technical operations at 29.8%, the creation of content and knowledge at 28.1%, and ethics and responsibility at 20.2%.

Regarding the other ESD practices which fall in the category of campus operations, the scores for all ICT activities were below 50%. These practices do not fall directly under the roles of academic staff; they are mainly practices falling under the Estates Department. The results could mean that the staff had little information about those practices. This is indicative of the fact that academic staff are more engaged in practices of curriculum development and implementation, teaching and learning, research and scholarship as well as outreach and service and less in student environmental sustainability and operational practices such as waste management, energy and water conservation practices.

A triangulation of the above findings on ICT use for SD implementation with the qualitative ones revealed that the findings using the two methods were in agreement. Asked to comment on how they and other members of staff had used ICTs to facilitate curriculum implementation, research and outreach in the area of ESD, the majority of the interview participants intimated that ICTs were mainly used for communication, information-sharing and collaboration. There was limited use of ICTs for interactive teaching and learning. ICTs were mainly used for general communication, information-sharing, managing information and the creation of content. The following statements from participants attest to this:

> I have not known many staff using ICT for teaching and learning. We use ICT for information-sharing.
> They use ICT for making notes, information transfer and to update themselves.

> Apparently, the only thing I can say is sharing information, not really notes. Very few staff use ICT activities. ICT facilities and internet are very limited so it is difficult to use ICT for teaching and learning.

The voices of students from the FGDs confirmed that there was limited use of ICTs in the university and reaffirmed that ICT use was mainly for information-sharing and communication. There was little use of ICTs for teaching and learning. The students observed that even university management had not fully embraced the use of ICTs because offices like that of the Academic Registrar had problems handling students' results online. From FDG 2, one participant explained, "ICTs are not fully used; the system for online registration and accessing of results are not working." Another participant added, "We have not yet embraced ICT fully even for information management because we are still submitting our projects in hardcopy only." A participant from FDG3 similarly explained that not all courses accepted online submission of students' project work and coursework.

Two faculties had, however, embraced ICTs as an interactive pedagogical tool to facilitate teaching and learning. The study found that faculties that were well-endowed with ICT facilities were involved in using ICTs for e-learning and other interactive innovative teaching and learning for ESD. A participant explained that they had the facilities and had done innovations in ICT:

> We have ICT, we have e-learning centre in the library. You are aware that the faculty has done a lot of innovations in ICT. You could have heard of the learning board made by one of our staff.

Other participants explained how the problem-based approach, one of the ESD-relevant pedagogical approaches, was well supported by the use of ICTs. The approach makes use of the different ICT activities of communication, creation of knowledge and sharing information. In the statement below, one participant underscores the importance of ICTs and explains how his faculty had embraced the use of ICTs because the problem-based approach required extensive use of ICTs:

> You know the problem-based learning approach and learner-centeredness has that advantage. That has made our students here explore a lot using ICT-based resources. Most of our resources are online, the library has only a few. The staff all have internet access and a computer or laptop. They use interactive whiteboard and all our classrooms have projectors.

The participant, however, observed that the faculty had not yet adopted some high-level and complex ICT systems that were much needed for teaching and learning, such as simulation systems for computerised models owing to inadequate resources. He also thought the staff needed more training in complex ICT issues and usage.

Some faculties were using ICTs to embrace online learning platforms and open distance learning (ODL). These were, however, still in infant stages. A participant stated that their faculty was exploring setting up online learning platforms and that work had begun on it. A participant from another faculty explained:

> We have e-learning programmes and we share ideas on a topic with students on the internet before the lecture room interaction. The process of turning our programmes to open distance learning has also started.

Other faculties had made use of online Google groups and social media, as exemplified by the statement: "Actually, what we do for every class is open up a communication network for staff and students, a Google email group, where we post materials for students before the lecture." Other participants who thought that academics were making considerable use of ICTs for teaching and

learning based their arguments on the use of ICTs for lecture and project presentations. A deep analysis of their explanations, however, pointed to ICT use for information-sharing and communication.

Data from interviews also corroborated the quantitative results related to ICT use for research, outreach and community engagement. One participant explained how they encouraged students to use ICT for research:

> The research projects for the students. We encourage them to give presentations; whether that is ICT or computer they do presentation. We encourage them to type their work and if they can send it on email the better so that we have a permanent record of the work because papers can be lost.

The participants confirmed that they used ICTs for community engagement but it was still at the level of communication, sharing of information and collaboration. Describing how his faculty had made use of social media for community engagement, a participant opined:

> Students and teachers have exploited social media. There is a WhatsApp group linking the faculty and the community during our mandatory outreach programmes, COBERS. Members of the rural communities can give us feedback on our students. For example, when a student does not report or disappears, the community can immediately report through the forum.

The survey, interview and FGD results all point to the limited use of ICTs and mainly for communication, sharing and information management. Apart from a few faculties that seemed to be doing fairly well in ICT use, the rest were struggling. There was little use of ICTs for core academic business, such as curriculum implementation, teaching and learning, research and outreach. Although most participants said that the staff and students used ICTs for communication and sharing and information management, it was clear that the use of ICTs was not specifically tailored to the pursuit of ESD goals in teaching, research and outreach, or even in operations.

Challenges encountered by academic staff in using ICTs for implementing ESD practices

The second objective of the study was to investigate the obstacles that impacted on the level of ICT use by academic staff in the university. Data for this objective was gathered qualitatively through interviews and FGDs. Most participants attributed the low level of ICT use to challenges caused by inadequate ICT equipment, facilities and poor internet infrastructure with limited connectivity. As a result, they argued that even if one wanted to make use of ICT, one found it difficult, as depicted in the statement: "Very few staff use ICT activities. ICT facilities and internet are very limited, so it is difficult to use ICT for teaching and learning." Another participant lamented about how the challenges of facilities and internet connectivity had crippled some of the teaching and learning activities in some of their programmes thus: "ICT use is dictated by the facilities."

The shortage of computers in relation to the big student enrolment in some faculties is another hindrance. The following statement draws attention to the deplorable situation in one faculty: "We have close to 2,000 students but, unfortunately, we have only 23 computers." Another participant emphasised the shortage of ICT equipment in the following statement: "The fact is that these gadgets are limited; one projector is used in a whole faculty. There are limited resources." The students in the FGDs also confirmed the challenges related to inadequate ICTs and internet access that had been raised by the interview participants. Stressing the hindrance to the use of ICTs, one participant from FDG 1 asserted, "We would want to make use of ICT for research but that is not possible. Some of us do not have personal computers and yet there are very few in the library."

Academics were equally unhappy with inadequate internet facilities and poor connectivity, which they considered a big hindrance to the use of ICTs for ESD purposes. The participants explained how they had to rely on personal devices and smart phones to access the internet, making it expensive for interactive teaching and learning. They complained about limited access, slow speeds and inadequate internet infrastructure. This is borne out by the following voices:

> Of course, you know all good things come with a cost. In some universities, internet is concentrated in a particular place where students can access it. Everybody goes there with their laptop or phone to access internet. For us here it is not possible. You buy your own. If you wanted to use Skype, can you do it?

> The issues of internet are just the same; students and staff are complaining. It is hindering the research component; it is hindering coursework because what is basically stocked in the library does not cover much. We have a big student population and the library cannot accommodate all of them but the internet is too slow; one thing takes a whole day to download.

> Internet is a big problem because we don't have the cyber. For heads of departments we had to buy modems for use in coordination. For students it is difficult; the search takes a long time although they have reported some improvement this semester.

One participant explained how their attempt to use Moodle failed because of unreliable internet service:

> We have tried interactive learning using Moodle but because of the nature of the faculty and equipment, it has not been successful. We are still struggling because using the Moodle platform required training and available internet.

The students in the FGDs also confirmed challenges related to internet access. The participants explained that the limited internet connectivity hindered the research and coursework components of their study programmes because the internet bandwidth was not enough. The internet problems were elaborated on further in comments such as:

> There are online resources but you can only access them in the library. You know that our library does not have enough space for all of us. Elsewhere on the campus there is poor internet connection.

Academic staff also mentioned inadequate knowledge of new digital technologies and inadequate skills to use them as a hindrance to the use of ICTs:

> The challenge I see is that a big number of people, staff and students do not have good computer skills. We also lack knowledge of new digital technologies. You cannot use what you do not know. This makes using ICT for teaching and learning, outreach or research a challenge.

The methods of assessment were deemed as a hindrance to the use of ICTs in ESD implementation. The participants revealed that they employed more of summative assessment methods than formative which, they argued, do not require interactive use of ICTs. Appropriate learner assessment in ESD relies heavily on formative assessment, creating room for learners to question and adjust their assumptions. The following quotation exemplifies the issue of inappropriate assessment hindering ESD implementation:

> Curriculum assessment methods should be ICT related not just knowledge. There has been an attempt to balance summative and formative assessment but I think we need to do more towards formative assessment.

Discussion

The findings of the study indicate a low level of ICT use by academic staff. The survey, interview and FGD results all point to the limited use of ICTs. There were a few faculties that seemed to be doing fairly well with regard to ICT use but, overall, ICTs were used for activities that required surface technological skills. The results show that across all ESD practices, academic staff majorly used ICTs for communication and sharing information, as well as for information management and creation. There was low use of ICT for activities such as collaboration, evaluation and problem-solving, ethics and responsibility and technical operations. There was more ICT use in practices that constitute the core of academic roles such as curriculum implementation, teaching and learning, and research and outreach. Among these practices, the low use of ICTs for community engagement is very noticeable. Academic staff had little information on ICT use in practices that did not fall under their jurisdiction; thus student programmes, programmed sustainability audits and resource or environmental conservation practices were hardly cited by staff in their use of ICTs. The study did not find any online platforms for ESD but the university was in the infant stages of developing online or e-learning and ODL programmes. This finding on the limited use of ICTs for improving learning experiences agrees with Rana and Rana's (2020) that teacher educators in a key university in Nepal made only limited use of ICTs for educational purposes.

The study findings show that the academic staff used ICTs for general purposes such as the preparation of lecture notes and tests, lecture presentation and web searches for research, but not to enhance students' learning. This could mean that the academic staff in Busitema University did not use ICTs as interactive tools for ESD and, therefore, the use of ICTs did not engage learners in developing key ESD competences. Such a general and surface use of ICTs does not develop cognitive, critical-thinking, problem-solving and systems thinking skills that are much required in building competences for sustainability. It does not improve the educational experiences of learners and cannot, therefore, effectively contribute to the quality of ESD (Moodly & Adu, 2014). This finding is similar to that of Muianga (2019), who reported that the emphasis on the use of ICTs to enhance student-centred learning in preparation for 21st century skills had not translated into a practice among academic staff of higher education institutions. Higher education teachers have continued to use traditional teaching methods and so ICTs play a secondary role in teaching and learning. Moodly and Adu (2014) equally revealed that the general use of ICTs did not add value to ESD. The duo concluded that for ICTs to contribute to educational experiences of learners, academics must focus on using technology that adds value to learners' experiences.

In the study findings, the limited use of ICT was attributed to a number of factors, among which was inadequate ICTs and poor internet infrastructure, limited access and inadequate ICT knowledge and skills. These findings resonate with those of other scholars, who have reported that the potential of ICTs to enhance teaching and learning is encumbered by many challenges. Rana and Rana report that the adoption of ICTs is encumbered by resource constraints, while Li et al. (2019) argue that the evolution of ICTs into pedagogical tools, coupled with the emergence of new technologies, created knowledge and skills gaps that posed a great challenge to academic staff in the use of ICTs. Rana (2018) found that school teachers had not adopted ICTs for pedagogical purposes or for engaging learners in deep and reflective thinking because of the kind of training they had received. They revealed that insufficient staff training, lack of ICT skills and inadequate implementation of ICT policy hindered ICT use among academic staff. A minimal level of ICT resources is needed (Rana,

2018) and teachers need professional development in ICT skills (Rana & Rana, 2020) for the effective use of ICT in teaching and learning.

Conclusion and Recommendations

The study findings reveal a low level of ICT use among academic staff. The use of ICTs is majorly for general and basic tasks and not as pedagogical tools or to support programmes in the implementation of ESD. Thus, academics do not use ICTs to promote experiential learning. They do not focus on tapping the potential of ICTs to add value to the educational experience of the learner. The limitations to ICTs use imply that academics in Busitema University are not effectively tapping into the power of ICTs to develop competencies for sustainable development. Thus, the transformation that should come with ESD is not happening. Having computers, using projectors and other technologies for doing basic things such as lecture presentation does not make them a transformative tool without purposefully targeting experiential and transformative learning.

We recommend that there is need for the implementers of ESD practices in higher education institutions to make more use of ICTs as pedagogical tools and affordances. They need to go beyond general use of ICTs and purposefully choose to make use of all types of ICTs and digital technologies to enhance the educational experiences of learners in order to develop ESD competences. This requires making careful decisions to ensure that ICT activities blend with pedagogy and programmes for the benefit of the teacher and learner. When ICTs are used this way, their dual purpose can release academic programmes from disciplinary restrictions, unleashing the interdisciplinary and multi-disciplinary nature of the ESD dialogue. Purposeful use of ICTs strengthens partnerships with stakeholders in the sustainability debate and takes the learning into real-life situations, enabling learners to have local and global encounters of sustainability. The transformation needed in ESD requires using ICTs in such ways that they can add value to ESD.

Universities such as Busitema that position themselves to educate for sustainable development need to address the challenges of and hindrances to the effective use of ICTs. The use of ICTs as a pedagogical tool in ESD should be enhanced through training of academic staff. Constant upgrading of skills is required to improve ICT skills and address the challenge that comes with new digital technologies. Institutions also need to address the issues of access to ICTs and the internet across faculties. Improving access to ICTs, making internet infrastructure available to all faculties, and upgrading computer laboratories, lecture rooms and libraries on each of the campuses will go a long way in supporting the use of technologies for ESD and other disciplines.

This investigation hinged on a case study of Busitema University, a public university in Uganda. Busitema operates on a multi-campus model, unlike many universities within Uganda. The picture of ICT use for ESD is likely to be different in other university contexts. A study of other universities, both public and private, is recommended for a broader investigation. Such a study is likely to provide more representative information that can be applied to a wider university context in Uganda and elsewhere in the world. Investigating ICT use in disciplines other than ESD would probably unveil substantial information, too. This study targeted academic staff only. It would be beneficial to the body of knowledge to investigate how other categories of staff are making use of ICTs.

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Declaration

We declare no conflict of interest.

Availability of data and material for data transparency

All data generated or analysed during this study are included in this published article. The original datasets are available from the corresponding author on reasonable request.

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Employee Engagement and Job Performance among Academic Staff in Public Universities in Uganda

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Abstract

The purpose of this study was to find out the relationship between employee engagement and job performance among university academic staff. The study, conducted at Makerere University, was guided by questions on the levels of engagement and performance among academic staff. A null hypothesis on the significance of employee engagement and job performance was also stated for investigation. The population of the study was comprised of 485 academic staff from10 different schools. A sample of 136 respondents was reached using a self-administered questionnaire containing closed-ended items along a Likert scale as well as open-ended questions. Analysis was done using the Statistical Package for Social Sciences (SPSS) version 21 by way of sums, means, frequencies, percentages and a bivariate, Pearson correlation coefficient. The findings, based on percentages and in agreement with statements, revealed that both employee engagement and job performance levels were high. There was a positive significant relationship between employee engagement and job performance ($r=.391$, $p<0.05$). The null hypothesis was rejected, meaning that engagement levels impact on performance. The recommendations, basing on the findings, focused on central and section managers developing strategies to heighten engagement levels in order to improve performance. This includes timely disbursement of financial and non-financial rewards, involvement of staff in decision, proper management of performance with reference to acceptable, barrier-free and well-scheduled appraisals as well as the provision of a conducive working environment.

Keywords: *Employee engagement; Job performance; Universities*

Background

Ordinarily, an engaged employee is a real performer. Engagement is an extremely important predictor of employee and, ultimately, organisational performance. Engagement and performance have been variously described. For instance, Kahn(1990) came up with the concept of work engagement and described engaged employees as those who are fully physically, cognitively and emotionally connected with their work roles, work harder through increased levels of discretionary effort and are highly committed. In addition, engaged employees burst with energy, dedicating all their skills and resources to their work. They are emotionally positive, open to new ventures or ideas, productive and willing to proactively go the extra miles by changing their work environment in order to stay engaged. A Chartered Institute of Personnel and Development (CIPD) report identified three core facets of employee engagement and these include: intellectual/cognitive engagement, which includes thinking intensively about the job and continuous improvements in it, affective/emotional engagement, which involves having positive feelings about the job and social engagement, which includes one's being ready to discuss matters of improvement in work with co-workers. Individuals with higher levels of engagement may experience this, unlike for those with lower levels of engagement or disengagement.

Employee performance refers to the outcome or contributions employees make to attain specific organisational set goals (Herbert, John, & Lee, 2000). Performance addresses the use of simple outcome-based financial indicators reflecting the fulfillment of the economic goals of the organisation. Employee performance is the ability of an employee to achieve a specified task measured against predetermined standards of accuracy, completeness, cost and speed (Sultan et al., 2012).Additionally, it is the measure of outputs such as loaves of bread vis-à-vis the inputs such as effort, time and energy. It may depend on a number of factors like performance appraisal, motivation, satisfaction, compensation, job security, organisational structure and others (Ali Asghar & Mohtsham Saeed, 2012). Furthermore, Borman and Motowidlo (1997) identified two different aspects of employee performance and these included: task performance, which involves activities that are related to employee's formal role requirements, and contextual performances, which involves activities that are not part of the formal role requirement but are viewed as promoting organisational effectiveness.

Ideally, a highly engaged employee tends to work harder and eventually performs better at their workplace. This is because they experience positive emotions such as happiness, gratitude, joy and enthusiasm, which have better psychological health and, usually, they transfer their engagement to their co-workers(Fredrickson, 2001). As a result of this dedication, employees receive higher ratings from their colleagues on in-role and extra-role performance. This means that there are discretionary behaviours on the part of an employee that are directly believed to promote effective functioning of an organisation without necessarily directly influencing a person's target productivity. Indeed, Bakker, Demerouti and, Verbeke (2004) confirm that highly engaged employees perform well and are willing to go the extra mile to do what is even not part of their role.

A study to establish the effects of fringe benefits and the nature of working conditions under motivation practices on teacher's performance in urban secondary schools in Jinja municipality; found that the state of teachers' performance had a mean of 2.7, indicating that teacher's performance was very low (Nairuba, 2011). This could be as a result of low engagement. The Employer of the Year Awards Survey(2013) conducted by the Federation of Uganda Employers in partnership with the Makerere University School of Psychology, revealed that 6% of the employees were disengaged and 45% were moderately engaged, meaning that the moderately and disengaged employees total

of 51% showed that there were low levels of employee engagement among employees in many organisations in Uganda. This raises a big challenge that needs to be addressed to enhance job performance. For instance, the correlation results of a study to investigate the contribution of training and employee engagement to job performance in Uganda's health sector indicated that there was a significant relationship between employee engagement and employee performance. The study found that the more the employee engaged him or herself, the better the job performance levels (Sendawula et al., 2018).

Engagement has been gaining increasing attention as a key determinant of performance among employees (Macey, Schneider, Barbera, & Young, 2011)tools, and case examples, Employee Engagement translates best practices, ideas, and concepts into concrete and practical steps that will change the level of engagement in any organization. Explores the meaning of engagement and how engagement differs significantly from other important yet related concepts like satisfaction and commitmentDiscusses what it means to create a culture of engagementProvides a practical presentation deck and talking points managers can use to introduce the concept of engagement in their organizationAddresses issues of work-life balanc. Cover; Praise for Employee Engangement; Talent Management Essentials; Title page; copyright; Dedication; Series Editors Preface.xhtml; preface; Acknowledgments; Chapter 1: Engaging Engagement; How Engagement Makes a Difference and What Engagement Is; How an Engaged Workforce Creates Positive Financial Consequences for Organizations; On High Performance Work Environments: Four Principles for Creating an Engaged Workforce; The Remainder of the Book; Chapter 2: The \"Feel and Look\" of Employee Engagement; The Feel of Engagement; The Look of Engagement: Employee Behavior. Strategically Aligned Engagement BehaviorWhat About Employee Satisfaction?; Where Does This Take Us?; Chapter 3: The Key to an Engaged Workforce: An Engagement Culture; What is Organizational Culture?; Creating a Culture for Engagement: How People are Valued in Organizations; The Role of Culture in Creating Strategic Employee Engagement; Summary; Chapter 4: Phase 1 of Creating and Executing an Engagement Campaign: Diagnostics and the Engagement Survey; Pre-Survey Diagnostic Activities; The Engagement Survey. Chapter 5: Phase 2 of Creating and Executing an Engagement Campaign: Action Planning and InterventionSurvey Results Interpretation; Survey Results Feedback; Preparing the Organization for Taking Action7; How Much Measurable Change is Possible?; Actual Changes That Build and Maintain Engagement; Summary; Chapter 6: Burnout and Disengagement: The Dark Side of Engagement; Disengagement: Early Unmet Expectations at Work; The Nature and Trajectory of Burnout; Effective Coping With Burnout; Additional Stress Factors and Disengagement; Remedies and Interventions. Resistance to Change and Engagement: Another Dark Side of EngagementHow Should Engagement Initiatives be Communicated?; Conclusion; Chapter 7: Talking Points: Introducing or Rethinking Engagement in Your Organization; The Slide Show; Notes; Aut…","author":[{"dropping-particle":"","family":"Macey","given":"William H.","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Schneider","given":"Benjamin.","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Barbera","given":"Karen M.","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Young","given":"Scott A.","non-dropping-particle":"","parse-names":false,"suffix":""}],"id":"ITEM-1","issued":{"date-parts":[["2011"]]},"number-of-pages":"353","publisher":"John Wiley & Sons","title":"Employee Engagement : Tools for Analysis, Practice, and Competitive Advantage.","type":"book"},"uris":["http://www.mendeley.com/documents/?uuid=48baddb5-7e9a-3edc-a84f-3a082f14c430"]}],"mendeley":{"formattedCitation":"

(Macey, Schneider, Barbera, & Young, 2011. From a contextual point of view, employee engagement is a positive fulfilling work-relate state of mind that is mainly characterised by three components of vigour, defined by high levels of energy and willingness to invest effort in one' s work; dedication, which refers to being deeply involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride and challenge, and absorption, characterised by full concentration in one's work or being immersed in it (Schaufeli & Bakker, 2002).

Makerere University has a well-known history of strikes by academic staff. In 2006, academic staff laid down their tools, citing failure by the government to honour a pledge made in 2004 regarding improvement of staff welfare. In 2007, the university was closed for two months as academic staff demanded better pay. In 2011 and 2014, academic staff held strikes over pension and salary arrears, respectively (New Vision, 2019). Recently, the public university staff formed joint associations, making them engage in joint industrial action. These occurrences called for an investigation of the level of academic staff engagement and performance.

Most organisations today need a strong and high level of employee engagement influence the achievement of organisational goals and effective performance, hence maintaining competitiveness with both local and global markets. This is only possible through identifying the most important and effective drivers of employee engagement that eventually enhance the performance of employees.

The Problem

There has been a persistentwave of strikes by academic staff in public universities over remuneration. This is an area of interest because this outcry over incentives and salaries leaves questions as to whether amidst such grievances, employees of public universities could remain engaged and consequently perform highly. Increased disengagement, characterised by low commitment and; negative emotions, among others, if maintained, will lead to low productivity, higher organisational turnover intent and, counter productive work behaviours such as absenteeism and, in general, poor employee performance.

Purpose of the Study

The study focused on finding out the relationship between employee engagementand job performance among public university academic staff, using Makerere Universityas the case. Research questions were set to establish the levels of engagement and job performance among Makerere University academic staff. The study hypothesised that employee engagement and job performance were not significantly related.

Scope of the study

Geographically, the study occurred among Makerere University Kampala academic staff. The study's duration was three months, and, focused on establishing the relationship between employee engagement and job performance among Makerere University academic staff.

Significance of the Study

Several stakeholders are target beneficiaries of this work. These include senior managers like Vice-Chancellors and their teams, line managers such as principals, deans and heads of departments (HODs) of different schools as well as policy-makers in the university and in government, especially the Ministry of Education and Sports, as well as that of Finance and Public Service. These can use

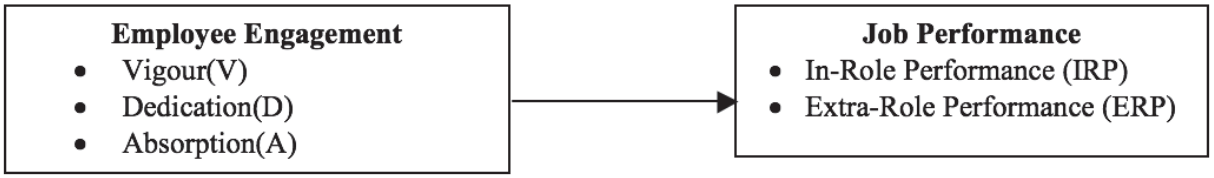
these findings to identify the reasons why some employees score low on engagement and, eventually, aid them to draft better strategies aimed at improving working conditions.

Researchers and academics could use these findings for reference and further research on related variables, hence using them to build on their literature, and prove or dis-prove other findings, among others. The researchers could be university students or experts in the field of research.

Conceptual Framework

This framework illustrates a one-step relationship between the independent variable, employee engagement (EE), and the dependent variable, job performance (JP), as shown.

Figure 1: A conceptual framework showing the predictive link between employee engagement and job performance.



Employee engagement is an independent variable that directly influences job performance. Engagement is evidenced by vigour, dedication and absorption. Vigour at work, is demonstrated by high energy with which work is done, working long hours, perseverance even when things do not work out and resilience. Dedication is shown by the interest, enthusiasm and pride in the work an employee does. Absorption refers to being immensely preoccupied with one's tasks.

Job performance was described by both in-role and extra-role tasks. In-role performance connotes the ability to work and attendance at work, as well as compliance with the norms and requirements of the job (Kagaari, Munene,& Ntayi, (2010). Extra-role performance is demonstrated by other attributes outside one's tasks such as courtesy and, concern for and interest in fellow employee's challenges that can hinder them from executing assigned work-related responsibilities.

It was conceptualised this study that highly engaged employees easily identify with the organisation or institution they work for, are dedicated to their work, have high vigour as they put much effort and energy into their work, believe in themselves, generate their own feedback and have values that match the organisation's (Bedarkar & Pandita, 2014).They work hard and perform better at their tasks (in-role), as well as aid their co-workers (extra-role), thereby impacting on their individual and organisational performance. Changes in the level of engagement affect the performance levels.

Theoretical Framework

There are many theories that can help explain how employees may get engaged. The study is premised on the understanding that a motivated employee is engaged and can perform. Fredrick Herzberg's (1959) study which revealed two factors: the dissatisfiers or hygiene factors such as organisational policies, administration, relationship with the supervisor, job status, salary as well as fringe benefits, and satisfiers or motivators like having a challenging job that gives responsibility, achievement, growth and recognition, enjoyment, advancement and personal development – underpinned this study. Basing on this theory, the motivators were stressed as being important because their presence increases engagement levels. Employees who value challenging work that gives them responsibility, achievement, enjoyment, personal development and advancement are more likely to be motivated and enthusiastic and engage highly, hence eventually performing much better (Herzberg, 1959).

The theory is backed up by the reinforcement theory that bases itself on the argument that the environment determines people's behaviour through the result of their actions (Skinner, 1971). Reinforcement can be used to explain how people get to be motivated to engage owing to external rewards like incentives in their jobs since it is presumed that motivated employees can get satisfied and engaged at their workplace. For instance, if an employee received a reward for their good effort and achievement such as a promotion, recognition, a scholarship or, a holiday, the same behaviour of working hard may be repeated because there are high chances that one may again receive a reward. Hence the more the reward or reinforcement, the higher the chances of the same actions manifesting.

Review of Related Literature

Employee engagement

Engagement was first presented by early theorists and scholars such as Kahn(1990), May,Gilson and, Harter(2004); as well as Schaufeli and Bakker(2004sharing between 10 per cent and 25 per cent of their variances; (2), all of whom describe employee engagement as a psychological state experienced by employees in relation to their work with associated behaviours of intellectual, emotional and behavioural dimensions. Furthermore,highly engaged employees dedicate themselves to their work roles, express themselves physically by being there and exerting effort in their role, emotionally by having a positive orientation such as pride and; enthusiasm, cognitively by thinking hard and paying attention during the execution of their tasks and, lastly, behaviourally by engaging in extra-role behaviours and being proactive, among others(Kahn, 1990).

There is always some confusion between employee engagement and organisational engagement. Saks (2006) helped to clear up this confusion by describing organisational engagement as a person's attitude and attachment to his/her company while employee engagement as the extent or degree to which an individual in the organisation is absorbed in the performance of theirtask. Also, engaged employees have passion and, energy about their work and are more often fully absorbed in it so that their work time passes quickly without them easily realising it (Macey & Schneider, 2008). Employee engagement is a positive fulfilling work-related state of mind characterised the following components: Vigour, which is expressed through having high levels of energy and willingness to work hard or execute daily tasks by investing more effort in one's work, feeling inspired and challenged by it; dedication, which involves being deeply involved in one's work and experiencing a sense of importance, enthusiasm, inspiration, pride and challenge; and absorption, which is characterised by full concentration on one's work while feeling happy and engrossed(Willmar, Schaufeli & Bakker, 2002). This is also seen when one has difficulty in detaching oneself from work, time passing quickly and one forgetting everything else around them.

It is also important to note that the concept of employee engagement is broad. Macey and Schneider (2008) identified key elements that have been used to define employee engagement and these include; trait engagement, which involves being conscientious, proactive in personality and having positive emotions; state engagement, which refers to being satisfied, involved and empowered; and behavioural engagement, which manifests through extra-role behaviours, pro-activeness and results in role expansion. For instance, Khan (1990), defines personal engagement as the harnessing of individual selves to their work roles physically, cognitively and emotionally during their performance. This contains at least one of the above-mentioned elements.

Employee engagement is a participative process that involves using the entire ability of workers and designed to encourage employee commitment to attain goals and objectives set by their organisations. Employee involvement, participation or taking part in making decisions makes the workplace more democratic in nature, and when employees are empowered, it leads to certain outcomes, such as creativity and innovation, which results in improving performance (Cotton, 1993)life programmes, quality circles, gain-sharing plans, self-directed work teams and employee ownership - with special attention to implementation. The final chapters summarize the success factors for better employee involvement systems. The need for employee involvement -- Empirical research and models of employee involvement -- Quality of work life programs -- Quality circles -- Scanlon plans and other gainsharing plans -- Representative participation -- Job enrichment -- Self-directed work teams -- Employee ownership -- Overall findings and future directions for research.","author":[{"dropping-particle":"","family":"Cotton","given":"John L.","non-dropping-particle":"","parse-names":fals e,"suffix":""}],"id":"ITEM-1","issued":{"date-parts":[["1993"]]},"number-of-pages":"310","publisher":"SAGE Publications","title":"Employee involvement : methods for improving performance and work attitudes","type":"book"},"uris":["http://www.mendeley.com/documents/?uuid=d4441b48-9243-3a09-afb6-b79745273cb0"]}],"mendeley":{"formattedCitation":"(Cotton, 1993. Furthermore, the Gallup Consulting Organisation (2006) points out three main identifiable categories of employees, and these include: engaged, not engaged and actively disengaged employees (Yuan & Lee, 2011). Engaged employees have a high sense of personal responsibility and; of obligation to what they should do for their organisation, work with passion, are innovative and creative, and feel a strong sense of attachment to their place of work.

On the contrary, disengaged employees demonstrate poor customer service, lack commitment and perform poorly. Their choice to participate is very low, they do not excel and do not care about the success of the organisation they work for. Painfully, such employees are unhappy individuals who try to lure everyone else around them to follow suit. Worse still, they oppose every idea at their workplace, undermine the efforts of their co-workers and are driven by negativity, hence becoming victims of poor performance. For instance, Crabtreemost of which are invasive ductal adenocarcinoma with dismal prognosis, cystic lesions of the pancreas are often either benign or low-grade indolent neoplasia. Those that are mucinous, namely, intraductal papillary mucinous neoplasms (IPMNs, in the Gallup report (2013) in the United States, indicates that between 2011 and 2012, non-engaged employees totaled 87% and engaged employees were only13%. Another survey carried out by CIPD, a consultancy firm, on employee attitude and engagement in Britain, revealed that levels of engagement nationwide were low (Truss & Chartered Institute of Personnel and Development, 2006a). Disengaged employees are like a chronic cancer that can slowly affect the success of the entire firm in terms of productivity (Rampersad, 2006; Ayers,2006). This condition affects both public and private workplaces.

Factors affecting employee engagement

There are many factors that can affect the engagement levels of employees.First,the employee's perception of the job. Employees who hold a negative attitudes towards their job tend to reduce their loyalty and customer service provision. Also, personal factors like beliefs, personal health and the wellbeing of individual employeessuch as lecturers, accountants, teachers and; managers, among others, tend to influence engagement levels (Maloney & Lock, 2008).Second is employee clarity of job expectations.Chances are high that once expectations are clear, employees can engage because

they have positive emotions like happiness as they go about their daily tasks(Hay Group,2002). It is, therefore, important to clarify expectations. Third, the quality of working relationships with co-workers and supervisors influences engagement levels. In situations where relations with managers are assumed to be distant, this hinders the employee's engagement because they are always worried about their supervisors.If the supervisors are good, supportive, trusting and close to the employees and co-workers, encourage them, care about them and are helpful, engagement is strengthened (May et al., 2004;Ryan & Deci, 2000)auton- omy, and relatedness. We discuss the SDT concept of needs as it relates to previous need theories, emphasizing that needs specify the necessary conditions for psycholog- ical growth, integrity, and well-being. This concept of needs leads to the hypotheses that different regulatory processes underlying goal pursuits are differentially associ- ated with effective functioning and well-being and also that different goal contents have different relations to the quality of behavior and mental health, specifically be- cause different regulatory processes and different goal contents are associated with differing degrees of need satisfaction. Social contexts and individual differences that support satisfaction of the basic needs facilitate natural growth processes including intrinsically motivated behavior and integration of extrinsic motivations, whereas those that forestall autonomy, competence, or relatedness are associated with poorer motivation, performance, and well-being. We also discuss the relation of the psycho- logical needs to cultural values, evolutionary processes, and other contemporary motivation theories.","author":[{"dropping-particle":"","family" :"Ryan","given":"Richard M.","non-dropping-particle":"","parse-names":false,"suffix":""},{"droppi ng-particle":"","family":"Deci","given":"Edward L.","non-dropping-particle":"","parse-names":fal se,"suffix":""}],"container-title":"Psychological Inquiry","id":"ITEM-1","issue":"4","issued":{"date-parts":[["2000"]]},"page":"227-268","title":"The \"What\" and \"Why\" of Goal Pursuits: Human Needs and the Self-Determination of Behavior","type":"article-journal","volume":"11"},"uris":["ht tp://www.mendeley.com/documents/?uuid=685950d3-6ada-4a7c-a4bd-684203ebb471"]}],"mend eley":{"formattedCitation":"(Ryan & Deci, 2000.

Leadership also increases engagement levels in situations where employees are inspired or supported by their supervisors or managers. Transformative leaders, for instance, develop and raise their subordinate's interests so that they can focus for the good of the organisation. They motivate employees to look beyond their own selfish desires for the common good of the organisation. With these kind of leaders, chances are very high that their subordinates will always engage themselves by being dedicated to their work with a lot of energy and passion (Gardner et al., 2005). Remuneration also plays a big role in increasing employees engagement levels and so it is important to know what kind of rewards to use for the different employee category. Additionally, when employees are rewarded, they also work hard to pay back by engaging and consequently performing (Saks,2006; Hagopian et al.,2009).Training and career development opportunities that are given to employees help equip them with new skills and ideas that adapt to the changing working world, hence improving on service delivery, accuracy and effectiveness in the workplace. This consequently increases competence and confidence in the job. This is a form of reward because employees feel valued and, obviously, are motivated to engage all the more in order to be productive (Adlerfer,1972).

Lastly, organisational policies, structures and practices have an impact on individual employee engagement levels. For instance, having fair recruitment and selection policies where employees are employed basing on their competence as opposed to other considerations, or having supportive welfare policies in the organisation increases the engagement levels of employees. (Schneider et al. 2009).

Job performance

To describe performance, one has to be specific, considering the differing contexts of each aspect. It must be such as employee performance, work performance, financial performance, organisational performance, productivity, student performance, or individual performance, among others. This study focused on job performance, which is an important factor in the organisation as it exposes the efficiency and effectiveness of teams and individual employees in achieving the set organisational goals. Performance is simply when employees or any individualperforming a particular task or set of obligations achieves it and creates a different environment that brings a benefit to the organisation. Performance is also a job-related activity that is expected of an employee and how well those activities are accomplished or completed(Dessler, 2011). It involves the achievement of quantifiable objectives of the organisation (Armstrong, 2006). Armstrong (2000), also cited in Kagaari, Munene and ,Ntayi (2010), states that job performance is a means of getting better outcomes from the whole Organisation, or the teams or individuals within it by understanding and managing performance within an agreed and designed framework of planned goals, standards and skill requirements.

Performance in the world of employment looks at all forms of workers such as doctors, nurses, teachers and police officers, among others. The World Health Organisation (WHO, 2006), for instance, defines a well-performing workforce as one that operates in ways that are responsive, reasonable, competent and proficient to achieve the paramount outcomes whether organisational, educational, related to security or health, and others. Poor performance among health workers, for instance, can lead to lack of access to quality health care. When it comes to an organisation or institution, poor performance of, for example, teachers, lecturers or employees in general, leads to poor or low outcome in terms of both products and services. Dieleman and Harnmeijer(2006)further argue that performance is a central attitudinal construct in industrial and organisational psychology. It refers to scalable actions, behaviours and outcomes that employees engage in that are linked with and contribute to the achievement of organisational goals. Performance is, according to Chan and Baum (2007), equally a result as well as a qualitative and quantitative measurement of effort to achieve the specific, measurable and attainable set goals.

Performance measurement, on one hand, is a periodical assessment of progress towards short- and long-term objectives and reporting of the results to decision-makers in an attempt to improve performance in such a way that managers find out if the goals and objectives or desired outcomes are being achieved (Kruk & Freedman, 2008)there is growing interest in assessing the performance of health systems in developing countries. This paper proposes a framework for the assessment of health system performance and reviews the literature on indicators currently in use to measure performance using online medical and public health databases. This was complemented by a review of relevant books and reports in the grey literature. The indicators were organized into three categories: effectiveness, equity, and efficiency. Measures of health system effectiveness were improvement in health status, access to and quality of care and, increasingly, patient satisfaction. Measures of equity included access and quality of care for disadvantaged groups together with fair financing, risk protection and accountability. Measures of efficiency were appropriate levels of funding, the cost-effectiveness of interventions, and effective administration. This framework and review of indicators may be helpful to health policy makers interested in assessing the effects of different policies, expenditures, and organizational structures on health outputs and outcomes in developing countries. © 2007 Elsevier Ireland Ltd. All rights reserved.",”author”:[{“dropping-parti cle”:””,”family”:”Kruk”,”given”:”Margaret Elizabeth”,”non-dropping-particle”:””,”parse-names”:

false,"suffix":""},{"dropping-particle":"","family":"Freedman","given":"Lynn P.","non-dropping-particle":"","parse-names":false,"suffix":""}],"container-title":"Health Policy","id":"ITEM-1","issued":{"date-parts":[["2008"]]},"title":"Assessing health system performance in developing countries: A review of the literature","type":"article"},"uris":["http://www.mendeley.com/documents/?uuid=db24c987-a2ff-3fb6-b8de-bef35047f07b"]}],"mendeley":{"formattedCitation":" (Kruk & Freedman, 2008. Performance can be measured using different approaches or techniques that are available. For instance, performance appraisal is one of the most popularly used methods to measure employee performance(Layne, Steinberg, & Steinberg, 2014)evaluation, and credentialing of mental health profes- sionals focus heavily on instilling the knowledge and skills needed for performing evidence-based assessment and treatment. We propose the content of a companion training curriculum in clinical decision-making that reflects the pervasive and indispensible role of causal reasoning in clinical practice. Contents of the proposed curriculum include review and discussion of the following areas: (a. Noe et al. (2008) describe five approaches that could be used to measure the performance of employees and these are the comparative, attribute, behavioural, quality and result approaches. However, for the purpose of this research, only the three related ones are discussed. First is the comparative approach, which measures employee' performance by comparing an individual employee's performance to that of another. In this approach, ranking is used which involves arranging from the highest performer to the lowest. Forced distribution involves putting employees in groups and ranking them. Paired comparison is where supervisors compare every employee with other employees in the work group by giving a score to one and using the score to compare which of the pair performs better. Armstrong (2009) states that the advantage with the comparative approach is that it is useful if an employee's performance needs to be differentiated from that of others, and that it is limited in that it does not measure performance against its absolute standards.

Second is the attribute approach, which involves identifying employees' characteristics that are necessary for organisational success and under this approach employee performance is measured according to those features. The graphic scale is used, where the supervisor rates the employees on a particular trait or characteristic basing on a standard scale. The approach is easy to develop and apply, and it is reliable and valid across a range of jobs. However, this technique may give rise to defensiveness among employees, as performance standards are usually vague and may be interpreted differently by different appraisers (Noe et al. 2008). Last is the behavioural approach, which defines the behaviours necessary for effective performance in a particular job. The supervisors assess performance by identifying the extent to which subordinates have exhibited the required behaviours. The tools used include: critical incidence, a behaviourally anchored rating scale, a behaviour observation scale and organizational behaviour modification (Noe et al., 2008). The advantage of this approach is that it provides employees with specific feedback on their performance and that it is acceptable to both employees and managers, but its weakness is that it assumes there is one best way to do the job (Noe et al., 2008).

Performance management, on the other hand, is an important aspect of bringing about and maintaining performance. It is a kind of process that consists of phases like goal-setting, measurement, assessment, feedback, recording of good results, improvement for bad results and applying sanctions in case of necessity(Kaplan, 2001;Chang, 2006to produce a generally applicable descriptive model. Elements of quality management performance measurement described include: strategic goal setting, operational management, individual appraisal, and reward and recognition

mechanisms. The key to successful performance measurement is ensuring congruence between all operational elements, encompassing employees at all levels in all departments, requiring total management commitment to teamwork, and information systems integrated with those of the customers and the suppliers.","author":[{"dropping-particle":"","family":"Chang","given":"Hs in Hsin","non-dropping-particle":"","parse-names":false,"suffix":""}],"container-title":"Service Industries Journal","id":"ITEM-1","issued":{"date-parts":[["2006"]]},"title":"Development of performance measurement systems in quality management organisations","type":"article-journal"},"uris":["http://www.mendeley.com/documents/?uuid=709ac699-c0fd-3841-9e67-1c7352cb9dac"]}],"mendeley":{"formattedCitation":"(Chang, 2006; Kasurinen, 2002).Furthermore, Mone and London (2003) emphasise five performance management activities that could enhance engagement and performance and these include; setting performance and development goals, providing ongoing feedback and recognition; managing employee development; conducting mid- and end-year appraisals; and building a climate of trust and empowerment with employees. These are elaborated below.

Employee performance can also be measured using two types of performance, which are process and outcome (Roe, 1999). Process performance involves those particular actions or behaviours which employees exhibit to achieve effective performance or what employees do in their work situations; while outcomes are the products or services that are consistent with organisational goals and objectives, such as customer satisfaction, creativity, innovation and; high productivity, among others, which can be viewed at the individual, team and organizational levels. Furthermore, process performance can be measured in three ways, which the study basically used to measure employee performance of the academic staff. First is task or in-role performance, which involves finding out those activities done by workers that are directly related to the employees' formal role requirements or duties specified in the job description that bring about the achievement of organisational goals and objectives (Fleishman, 1967)often in applied contexts , under numerous task and environmental lPortions of this article appeared also in E. A. Fleishman, Development of a behavior taxonomy for describing human tasks: a correlational-experimental approach.","author":[{"dropping-particle":"","family":"Fleishman","given":"Edwin A.","non-dropping-particle":"","parse-names":false,"suffix":""}],"container-title":"Human Factors: The Journal of Human Factors and Ergonomics Society","id":"ITEM-1","issued":{"date-parts":[["1967"]]},"title":"Performance Assessment Based on an Empirically Derived Task Taxonomy","type":"article-journal"},"uris":["http://www.mendeley.com/documents/?uuid=bef239d6-0a27-3a08-bbf2-de5f18037a5a"]}],"mendeley":{"formattedCitation":"(Fleishman, 1967. For example, a lecturer has to fulfil all the requirements of the job that the status of a lecturer entails (Goodman & Svyantek, 1999). Second is contextual or extra-role performance, which entails those activities or behaviours that are not directly part of the formal role requirements of an employee but are essential in promoting organisational effectiveness (Borman & Motowidlo, 1997). An example is, an employee helping others with heavy workloads. These behaviours are usually referred to as Organisational citizenship behaviours (OCB). Also, altruism of OCB or extra-role behaviours (Smith, Organ, & Near, 1983b). Counter productive work behaviour (CPWB) refers to acts against organisational goals such as taking undeserved work breaks and putting little effort into one's job, among others (Fox & Spector, 1999dispositional, and a□ective antecedents of counterproductive work behaviors. A model based on the organizational frustration±aggression work of Spector and colleagues was tested using structural equa-tion modeling and zero-order correlational analysis. As expected, a positive relationship was found between employees' experience

of situational constraints (events frustrating their achievement of organizational and personal goals;Smith, Organ, & Near, 1983)"type":"article-journal","volume":"68"},"uris":["http://www.mendeley.com/documents/?uuid=fd010de4-fbd2-4c39-8471-7c2364eaa714"]}],"mendeley":{"formattedCitation":"(Smith, Organ, & Near, 1983a.

Besides employee engagement, performance is influenced by a number of internal and external factors which Woods (2014),as cited in Tarus (2014), affirms includes personal issues, job stability, motivation to succeed, working conditions, job training and performance feedback. Furthermore, poor performance can result from many factors, such as low pay, low recognition, negative emotions or personality. An engaged workplace encourages commitment, energy and productivity from all those involved and this helps improve business performance (Business Link, 2010) and so managers must drive engagement by ensuring that there is good feedback, rewards and recognition to improve performance as an outcome (Mone & London, 2018). Additionally, Krivank (1999), as cited in Tarus(2014), argues that for an employee to exceed performance expectations, they should have the requisite knowledge, skills, ability, motivation, standards and feedback. Koontz (1990) elaborates that employee performance can be increased through proper pay systems, which are either financial, such as salaries, bonuses, wages and allowances, or non-financial, such as recognition, training, medical care, meals and housing, among other incentives. Harzing (2004), further argues that performance involves links to the organisation's strategy, the setting of individual performance goals, providing regular feedback on the progress made on these goals, providing opportunities for improving performance and, lastly, linking results and rewards, meaning that performing employees who obviously achieve goals must be rewarded to enhance their morale.

Cropanzano and Mitchel (2005) carried out a study on social exchange and their findings revealed that when employers and employees abide by the rule of social exchange, there will always be a trusting and loyal relationship between them. This simply means that social exchange plays around action and reaction in a more reciprocal relationship. For instance, if an employee performs better or has achieved a good performance appraisal, a reward or some form of appreciation is expected, and this increases the chances of the individual performing more. Therefore, performance will always be maintained and increased as long as action and reaction are maintained or rewards are maintained from both sides of the employment relationship.

Employee engagement and job performance

Many studies have revealed positive and negative linkages between engagement and job performance among both employees and students. For instance, Marciano (2011), argues that employee engagement predicts employee outcomes and, therefore, performance. Engaged employees want to win and perform a task in the best possible way by taking their time and doing things right. A survey of Greek employees working in fast food restaurants supports this. The participants were asked to fill in a diary booklet for five consecutive days, and the results showed that highly engaged employees performed better on a daily basis, and that the higher the employee's level of daily engagement, the higher the achievement of the objective on financial returns and therefore, performance. They found that job and personal resources also independently or jointly predict work engagement and have particularly positive impacts on engagement.

When job demands are high, engagement, in turn, positively affects job performance (Xanthopoulou et al., 2009a). This means that engagement predicts employee performance. Contrary to the above view, Halbesleben andWheeler; (2008b), in their studies, found that there was no strong

relationship between engagement and performance. They collected data from 587 employees in the United States, representing a wide variety of industries and occupations. The results showed that work engagement had a significant semi-partial correlation with self-rated, supervisor-rated and co-worker-rated performance. This meant that work engagement had a relatively small effect on employee performance, meaning that the goals set increase the engagement levels of employees, who become highly optimistic at work and, eventually, this high level of optimism leads to higher levels of individual performance. This is an advantage to the organisation or institution at large.

There is also an indirect relationship that has been observed by some studies. For instance, Medlin and Green (2009)employee engagement, workplace optimism, and individual performance constructs. Goal setting is hypothesized as positively impacting employee engagement, employee engagement as positively impacting workplace optimism, and workplace optimism as positively impacting individual performance. Data collected from a sample of 426 full- and part-time employees are analyzed following a structural equation modeling methodology. The measurement and structural models fit the data relatively well. Goal setting positively impacts employee engagement, employee engagement positively impacts optimism, and optimism positively impacts individual performance, as hypothesized. Results indicate that formal, structured goal setting processes lead to higher levels of employee engagement, that higher levels of engagement lead to improved workplace optimism, and that improved optimism in turn leads to higher levels of individual performance. The paper provides empirical support for the implementation of management programs that foster goal setting, employee engagement, and workplace optimism for the purpose of enhancing the performance levels of individual employees.","author":[{"dropping-particle":"","family":"Med lin","given":"Bobby","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Green","given":"Kenneth W.","non-dropping-particle":"","parse-name s":false,"suffix":""}],"container-title":"Industrial Management and Data Systems","id":"ITEM-1","issue":"7","issued":{"date-parts":[["2009"]]},"page":"943-956","title":"Enhancing performance through goal setting, engagement, and optimism","type":"article-journal","volume":"109"},"uri s":["http://www.mendeley.com/documents/?uuid=f5417934-daab-4d41-9e84-951c14f1a259"]} ,"mendeley":{"formattedCitation":"(Medlin & Green, 2009, conducted a study to investigate the relationship among goal-setting, work engagement, optimism and individual performance among 426 full- and part-time employees in the Southern United States. The results revealed that goal-setting had a positive impact on work engagement (standardized coefficient (SC)=58, t=11.04, p<.01) and work engagement had a positive impact on workplace optimism (SC=.65, t=11.17, p<.01) which, eventually, impacted positively on performance (SC=.77, t=13.05, p<.01).

The concept of engagement has gained interest among both organisational practitioners and the scholars. Engaged employees have been found to be instrumental to organisational support since they actively perform their roles better, consequently being productive (Quinones, Van Den Broeck, & De Witte, 2013). Smith et al., (1983b) also affirm that such employees are known to be engaged in extra-role behaviours and, therefore, make an extra contribution to an organisation without having it incur extra costs in compensation. Chan Min Kim1 and Seung Won Park (2015) add that engaged employees are able to produce quality products and this ensures that organisational products and services appeal to the market. Employees who put a lot of emotional energy into work roles contribute to the achievement of organisational goals in a number of related ways (Kahn, 1990). Those who invest emotional energy into their roles enhance performance through the promotion of increased connections among co-workers in the struggle to achieve organisational goals (Ashforth &

Humphrey, 1995)research has generally neglected the impact of everyday emotions on organizational life. Further, organizational scholars and practitioners frequently appear to assume that emotionality is the antithesis of rationality and, thus, frequently hold a pejorative view of emotion. This has led to four institutionalized mechanisms for regulating the experience and expression of emotion in the workplace: (1. Investment of emotional energy also helps individuals meet the emotional demands of their roles in a way that results in more complete and authentic performance. Further, engaged employees have been shown to achieve higher levels of job performance/work performance and in-role performance. For instance, in a study carried out to examine the relationship between work engagement and performance and the moderating role of conscientiousness among 144 employees in the Netherlands, Bakker, Demerouti and Cooper (2012) reported that work engagement was positively related to contextual performance (b=.40, t=2.54, p<0.5) and task performance (b=.45, t=2.94, p<.01). Furthermore, adaptive and proactive behaviours at work and role performance are outcomes of high levels of engagement (Salanova & Schaufeli, 2008).

Harter et al. (2009), in a meta-analysis study, reported that engagement was related to the nine performance measures used in organisations whose employees displayed high levels of engagement or who were actively disengaged. Anitha (2014) supports this reporting that there is a strong significant relationship between employee engagement and performance. Kirk-Brown and Van Dijk, (2011)the current study examined the relationship between work engagement, perceptions of psychological safety at work and the performance of organisational citizenship behaviours for employees with chronic illness (N = 92 also investigated the relationship between work engagement and performance among 604 employees in Australia, of whom 92 had chronic illnesses, and the results showed that work engagement had a positive relationship with performance for both groups. In another meta-analysis study conducted by Halbesleben and Wheeler (2008a), it was found that engaged employees displayed higher commitment to their jobs as well as the organisation, improved health and higher levels of job performance. Engaged employees, according to Truss of the Chartered Institute of Personnel and Development (2006b), are passionate, totally immersed in their work, energetic, committed and completely dedicated. The more engaged they become, the better they perform (Macey et al., 2011)tools, and case examples, Employee Engagement translates best practices, ideas, and concepts into concrete and practical steps that will change the level of engagement in any organization. Explores the meaning of engagement and how engagement differs significantly from other important yet related concepts like satisfaction and commitmentDiscusses what it means to create a culture of engagementProvides a practical presentation deck and talking points managers can use to introduce the concept of engagement in their organizationAddresses issues of work-life balanc. Cover; Praise for Employee Engangement; Talent Management Essentials; Title page; copyright; Dedication; Series Editors Preface.xhtml; preface; Acknowledgments; Chapter 1: Engaging Engagement; How Engagement Makes a Difference and What Engagement Is; How an Engaged Workforce Creates Positive Financial Consequences for Organizations; On High Performance Work Environments: Four Principles for Creating an Engaged Workforce; The Remainder of the Book; Chapter 2: The \"Feel and Look\" of Employee Engagement; The Feel of Engagement; The Look of Engagement: Employee Behavior. Strategically Aligned Engagement BehaviorWhat About Employee Satisfaction?; Where Does This Take Us?; Chapter 3: The Key to an Engaged Workforce: An Engagement Culture; What is Organizational Culture?; Creating a Culture for Engagement: How People are Valued in Organizations; The Role of Culture in Creating Strategic Employee Engagement; Summary; Chapter 4: Phase 1 of Creating and Executing an Engagement Campaign:

Diagnostics and the Engagement Survey; Pre-Survey Diagnostic Activities; The Engagement Survey. Chapter 5: Phase 2 of Creating and Executing an Engagement Campaign: Action Planning and InterventionSurvey Results Interpretation; Survey Results Feedback; Preparing the Organization for Taking Action7; How Much Measurable Change is Possible?; Actual Changes That Build and Maintain Engagement; Summary; Chapter 6: Burnout and Disengagement: The Dark Side of Engagement; Disengagement: Early Unmet Expectations at Work; The Nature and Trajectory of Burnout; Effective Coping With Burnout; Additional Stress Factors and Disengagement; Remedies and Interventions. Resistance to Change and Engagement: Another Dark Side of EngagementHow Should Engagement Initiatives be Communicated?; Conclusion; Chapter 7: Talking Points: Introducing or Rethinking Engagement in Your Organization; The Slide Show; Notes; Aut…","author":[{"dropping-particle":"","family":"Macey","given":"William H.","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Schneider","given":"Benjamin.","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Barbera","given":"Karen M.","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Young","given":"Scott A.","non-dropping-particle":"","parse-names":false,"suffix":""}],"id":"ITEM-1","issued":{"date-parts":[["2011"]]},"number-of-pages":"353","publisher":"John Wiley & Sons","title":"Employee Engagement : Tools for Analysis, Practice, and Competitive Advantage.","type":"book"},"uris":["http://www.mendeley.com/documents/?uuid=48baddb5-7e9a-3edc-a84f-3a082f14c430"]}],"mendeley":{"formattedCitation":"(Macey et al., 2011. In fact, a decline in engagement levels, as reported by Mone et al., (2011), can have an effect on productivity, customer service and performance at both individual and organizational levels.

In conducted by Joo and Mclean (2006), as cited by Shmailan (2016), on 7,959 business units in 38 countries, it was revealed that the outcomes of satisfaction, profitability, lower turnover of staff and reduced work mishaps were due to higher satisfied and engaged staff. A similar study to examine the crossover of daily work engagement revealed that daily work engagement was positively significantly related to daily task performance for both actors ($r=.55$, $p<.01$) and partners ($r=.48$, $p<.01$).This means that an increase in engagement leads to an increase on daily task performance. Engagement is, therefore, an important aspect of the employer-employee relationship that should be sought by both parties.

Reasons why engaged employees perform

From the aforementioned revelations, it is important to summarise reasons why engaged employees attained desirable performance. There are four reasons why engaged workers perform better than their non-engaged co-workers or colleagues. First and foremost, engaged employees often experience positive emotions, including gratitude, joy, happiness and enthusiasm. These positive emotions broaden an employee's thoughts, implying, as Fredrickson (2001) put it, that they constantly work on their personal attributes. Secondly, engaged workers experience better health because of their positive disposition, implying that they can focus and dedicate all their skills and energy resources to their work without the disruption resulting from absenteeism. Thirdly engaged employees create their own job and personal resources. Lastly, engaged employees transfer their engagement to others in their immediate environment or surrounding since in most organisations, performance is a result of a combined collaborative effort and engagement of one person may be transferred to others and indirectly improve team performance (Xanthopoulou et al., 2009a).

High performance in the 21st century demands innovation, flexibility and speed. Therefore, employers need to engage their employees, especially by giving those opportunities to participate, be free and to trust. Additionally, performance data from the best companies in the United States shows that objectives are more easily met when employees are fully engaged (Martel, 2003).

It is on the basis of the importance of these two variables that the study set out to investigate the level of and relationship between engagement and job performance in public universities in Uganda, using Makerere University, the biggest, most highly rated and oldest in the country.

Methodology

Research design

A correlation research design was used and deemed fit since the aim of the study was to establish the cause-and-effect relationship between employee engagement and job performance. Additionally, a quantitative research approach was utilized with a questionnaire because it involved testing the levels of variables and predicting relationships between variables.

Population and sample size

The population of the study comprised all Makerere University academic staff from the. The sample size, comprised of 214 academic staff, was obtained using the Krejcie and Morgan, 1970) sample size table and this was sampled randomly.

Data collection

The study used a self-administered questionnaire with closed-ended statements or items along a 5-point Likert scale starting from strongly disagree (1) to strongly agree (5) that were filled by the respondents. The aim was to establish the relationship and levels between employee engagement, expressed by responses on vigour, dedication as well as absorption and job performance, from items demonstrating in-role and extra-role job performance. The tool also had open-ended questions to solicit the free opinion of respondents on other factors that affect both engagement and the performance of academic staff.

Quality control

Content validity was achieved by having the supervisor check the questionnaire to verify if the items exactly measured the variables employee engagement and job performance as intended. Furthermore, adequate time was used to gather enough literature review that was used to support the questionnaire formulation. Reliability, on the other hand, was managed by ensuring that the statements were in line with the study objectives and that there was consistency in explaining the items, purpose and objectives of the study for better understanding to all respondents.

Data analysis

Analysis was done using the Statistical Package for Social Sciences (SPSS) version 21, descriptive statistics such as frequencies, mean score to determine the strength and level of each variable as well as percentages. The hypothesis was tested using Pearson correlation coefficient.

Limitations to the study

The response rate was initially low but this was solved through creating a good rapport with the respondents, giving a proper explanation of the purpose and objectives of the study as well as

the advantages of the findings to the institution, and making consistent follow-up to remind the respondents that they had to complete the questionnaires properly. The timing for the collection of data, in the morning hours, was also crucial since most academic staff would spare some time to complete the questionnaire.

Presentation of Results

Respondent's background information

The background information or sample characteristics of the respondents were mainly on their sex, marital status, job status, age, period of service, religious affiliation and levels of education, which are presented in the table below.

Table 1: Background information of the respondents

Variables	Levels	Number (N)	Percentage (%)
Sex	Male	90	66.2
	Female	46	33.8
Marital status	Married	104	83.8
	Single	22	16.2
Job status	Assistant lecturer	50	36.8
	Lecturer	56	41.2
	Senior lecturer	16	11.8
	Associate professor	6	4.4
	Professor	8	5.9
Age	20–30	18	13.2
	31–40	42	30.9
	41– 50	46	33.8
	51– 60	22	16.2
	61 years and above	8	5.9
Highest level of education	Masters	52	38.2
	PhD	84	61.8
Period of service in the institution	1–5	26	19.1
	6–10	30	22.1
	11–15	34	25.0
	16–20	24	17.6
	21 years above	22	16.2
Religious affiliation	Catholic Anglican	22 29	31.1 39.7
	Pentecostal	16	21.9
	Muslim	4	5.5
	Others	2	2.7

According to Table.1 above, findings show that there were more male respondents (66.2%) as compared to the females (33.8%).The majority of the respondents were married (83.8%) and only a

small number (16.2%) were single. It was also found that the majority (41.2%) of the respondents were Lecturers, followed by Assistant Lecturers (36.8%), Senior Lecturers (11.8%), Professors (5.9%) and then Associate Professors (4.4%). The majority(33.8%) of the respondents fell within the age bracket of 41–50, followed by 30.9% of the respondents in the age bracket of 31– 40 years. Those between the ages of 51 and 60 were 16.2%, while 13.2% were between 20 and 30. Only 5.9% were over 61years of age. When it came to educational levels, it was found that the majority of the respondents (61.8%) were PhD holders while only 38.2% were holding a master's degree. This result validates the findings because academic staff from the level of Lecture must be PhD holders.

When it came to years the respondents had spent serving in the institution, it turned out 25.0% had served between 11 and 15 years, followed by 22.1% between 6 and 10 years, 19.1% between 1 and 5years,17.6% between 16 and 20years and only16.2% for over 21years and above. For academic staff in Makerere University, there is a specified amount of time one must spend between the ranks, hence the variation in the period served.

Lastly, the majority of the respondents did not give an answer to the item on religious affiliation. For those who responded, the findings revealed that the majority (39.7%) were Anglicans, followed by Catholics, who were 31.1%, then Pentecostals, who stood at 21.9%, Muslims, who constituted 5.5% and others who did not specify accounted for 2.7%.

Employee engagement

The study aimed at finding out the levels of employee engagement among the respondents with the expectations that it would be either high or low. It is important to note that when it came to analysing the levels of employee engagement, the total frequencies and percentages for those who strongly disagreed and the ones who disagreed were put together as well as for those who agreed and strongly agreed, thus leaving three columns for analysis of " disagreed", "not sure" and "agreed" . Analysis was based on the three components of vigour, absorption and dedication, as presented in the table below.

Table 2: Levels of employee engagement

Items		Disagree		Not sure		Agree	
Vigour		N	%	N	%	N	%
1	When I get up in the morning, I feel like going to work	2	1.5	8	5.9	126	92.7
2	At my work I feel bursting with energy	24	17.6	24	25.0	78	57.4
3	At my work I always persevere even when things don't go well	8	5.8	18	13.2	114	83.9
4	I can continue working for very long periods of time	18	13.2	10	7.4	108	79.4
5	At my job I am very resilient mentally	6	4.4	12	8.8	116	85.3
6	During duty work, I feel very strong and vigorous	8	5.9	30	22.1	98	72
Dedication							
7	My job is very challenging	20	14.7	18	13.2	98	72
8	I find the work that I do full of meaning and purpose	8	5.9	8	5.9	120	88.3
9	My job inspires me and gives me hope	6	4.4	10	7.4	120	88.2
10	I am enthusiastic about my job	0	0	10	7.4	126	92.6
11	I am proud of the work that I do	4	2.9	4	2.9	128	94.1

Items		Disagree		Not sure		Agree	
Absorption							
12	Time flies when I am working, I just realise it is past time	10	7.4	16	11.8	110	80.8
13	When I am working, I forget everything else around me	56	41.2	28	20.6	52	38.3
14	I get carried away when I am working	38	27.9	32	23.5	66	48.6
15	It is difficult for me to detach myself from my job	22	16.1	14	10.3	100	73.5
16	I am immersed in my work	8	5.8	26	19.1	102	75
17	I feel happy when I am working intensely	16	11.8	20	14.7	98	72.1
18	I love doing my work in that I just realise time has gone	12	8.8	26	19.1	96	70.6

Vigour: From observations in Table 2 above, it was discovered that when the respondents were asked to rate themselves on whether when they got up in the morning, they felt like going to work, the majority (92.7%) highly agreed, while 5.9% were not sure and only 1.5% disagreed. This meant that on this particular item, the respondents were highly engaged with vigour to go to work whenever they woke up. The research findings further revealed that while at work, 57.4% agreed that they felt bursting with energy, some (25.0%) were not sure if they felt the same and only 17.6% disagreed with the statement. Additionally, 83.9% highly agreed that they persevered even when things did not go well, 13.2% were not sure, while only 5.8% disagreed. Interestingly, 79.4% agreed that they could continue working for very long periods of time, while 13.2% disagreed and only 7.4% were not sure if they could continue working for very long periods of time. The findings further revealed that 85.3% of the respondents were highly resilient mentally, 8.8% were not sure and only 4.4% disagreed. Also, during duty work, 72% of the respondents agreed that they felt vigorous and strong, while 22.1% were not sure, leaving only 5.9% in disagreement

From the six items of vigour, most of the respondents were in agreement, starting from 55.3% as the lowest and going up to 92.7% as the highest. The highest percentage for disagreement with the items was 17.6%and the lowest was1.5%,leaving engagement on the vigour component high.

Dedication: When asked if their job was challenging, 72% agreed, 13.2% were not sure and only 9% disagreed. Additionally,88.2% agreed that their job inspired them and gave them hope, 7.4% were not sure and only 4.4% disagreed, meaning that to them, their job neither inspired them nor give them hope. Asked if they were enthusiastic about their job,92.6% agreed that they were, 7.4% were not sure and no one disagreed. The majority of the respondents (94.1%) were proud of the work that they did, while 2.9% were not sure. Additionally, 88.3% strongly agreed that they found the work that they did full of meaning and purpose, while 5.9% were not sure and the same number disagreed.

Regarding dedication, the highest percentage who agreed with the items was 94.1% and the lowest72%, while in connection with disagreement, the highest was 9% and the lowest zero, meaning that the academic staff were high on dedication, at an average of 86%.

Absorption: Regarding the absorption items, in connection with the item that has to do with forgetting everything else around one during work, the majority of the respondents (41.2%) disagreed that they could not forget everything else around them while 38.3% agreed that during work, they could forget everything else around them, and only 20.6% were not sure.When asked if time just flew and they just realised it was past time, 80.8%agreed, 11.8% were not sure and only 7.4% disagreed with the statement. Furthermore, 48.6% agreed that they got carried away when

working, while 23.5% were not sure and 27.9% disagreed. In addition, 73.5%highly agreed that it was difficult for them to detach themselves from their job but 16.1% disagreed and only 10.3% were not sure. Whereas 75% agreed that they got immersed in their work, 19.1% were not sure and 5.8% disagreed. Those who felt happy when working intensely were 72.1%, with 14.7% not being sure and 11.8%disagreeing. The findings further revealed that 70.6% agreed that they loved doing their work in that they just realised that time had gone. Those not sure were 19.1% and only 8.8% disagreed. Regarding absorption, the highest percentage in agreement was80.8% and the lowest 38.3%, while the highest who disagreed accounted for 41.2% and the lowest 5.8%,meaning that the respondents were slightly low on absorption.

Job performance

The second objective that the study sought to find out was the levels of employee performance, which were analysed using in-role and extra-role performance item frequencies and percentages, as represented in the table below.

Table 3: Levels of employee performance

Items		Disagree		Not sure		Agree	
Extra-role performance (ER)		N	%	N	%	N	J.R., %
1	I help other colleagues who are absent from duty	20	14.7	14	10.3	102	75
2	I take time to listen to co-workers' problems and worries	4	2.9	24	17.6	108	79.4
3	I take a personal interest in other employees	20	14.7	34	25.0	82	60.3
4	I go out of the way to help new employees	10	7.4	30	22.1	96	70.6
5	I give advanced notice when unable to come to work	32	23.5	20	14.7	84	61.7
In-role performance (IR)							
6	My attendance at work is always above the norm	6	4.4	20	14.7	110	80.9
7	I tend to take undeserved work breaks (R)	100	73.5	20	14.7	16	11.8
8	I obey informal rules created to maintain order during duty	6	4.4	24	17.6	106	77.9
9	I fulfill all the requirements of my job	4	2.9	14	10.3	118	86.8
10	I have the skills and expertise to perform my job-related tasks	0	0	0	0	136	100
11	I can manage more tasks than those typically assigned to me	14	10.3	10	7.4	112	82.3
12	I feel I appear suitable for a higher-level role than the one I do	8	5.8	28	20.6	100	73.6
13	I have the required skills in all areas of my job	2	1.5	10	7.4	124	91.2
14	I perform well in my overall job by carrying out tasks as expected	0	0	2	1.5	134	98.5

It is important to note that the levels of performance among employees were measured using in-role/task performance items, which were nine (9), and extra-role/contextual performance items, which were five (5).

Extra-role performance

When the respondents were asked if they helped other colleagues who were absent from duty, 75% agreed that they did, while 14.7% disagreed, and only 10.3% were not sure whether they helped or not. Furthermore, 79.4% agreed that they took time to listen to co-workers' problems and worries. Only 2.9% disagreed and the remaining 17.6% were not sure. Additionally, 60.3% agreed that they took a personal interest in other employees, 25.0% were not sure, while only 14.7% disagreed with

the statement. The majority (70.6%) of the respondents agreed that the went out of their way to help new employees, though 22.1% were not sure and only 7.4% disagreed. Further findings revealed that 61.7% of the respondents agreed to giving advance notice when unable to go to work, 14.7% were not sure, while 23.5% disagreed with the statement.

In summary, the percentages for agreement were slightly high, with an average of 69%, compared to those who disagreed, meaning that when it came to extra-role performance, the respondents scored moderately high.

In-role performance

Of the respondents, 80.9% agreed that their attendance at work was always above the norm while 4.4% disagreed and 14.7% were not sure. Furthermore, when it came to taking underserved work breaks, 73.5%disagreed, meaning that they took deserved work breaks. Only 11.8% agreed and 14.7% were not sure of taking undeserved work breaks.With regardto obeying informal rules created to maintain order during duty, 77.9% agreed, while only (4.4%) disagreed with the statement, leaving only (17.6%) who were not sure of their rating. The findings further revealed that 86.8% highly agreed to fulfilling all the requirements of their job, 2.9%disagreed and 10.3% were not sure about that. All the respondents (100%) highly agreed that they had the skills and expertise to perform their job-related tasks. In addition, 82.3% agreed that they could manage more tasks in their job than if only one was typically assigned to them, 10.3% disagreed, while (7.4%) were not sure. Also, 73.6% agreed that they felt suitable for a higher-level role than the one they were holding while only 5.8% disagreed. Furthermore, 91.0% of the staff agreed that they had the required skills in all areas of their job and 98.5%stated that they performed well in their overall job by carrying out tasks as expected.

In conclusion, therefore, the levels of agreement on extra-role performance were high, as evidenced by an average of 78.1% agreeing with all the inquired upon aspects. Furthermore, the respondents scored higher on in-role performance compared to extra-role performance as evidenced by the average responses on agreement respectively.

Employee engagement and job performance

The main objective of the study was to find out if employee engagement and performance were significantly related among Makerere University academic staff and this was confirmed by testing the hypothesis using Pearson coefficient correlation and results are represented in the table below.

Table 4: Correlation between employee engagement and job performance

Variables	1	2	3	4	5	6	7
1. Vigour engagement	**.628**						
2. Dedication engagement	.571**	**.776**					
3. Absorption engagement	.586**	.440**	**.717**				
4. Overall engagement	.843**	.728**	.889**	**.840**			
5. Extra-role performance	.218*	.174*	.131	.199*	**.668**		
6. In-role performance	.341**	.323**	.308**	.384**	.155	**.700**	
7. Overall performance	.373**	.333**	.297**	.391**	.719**	.798**	**.706**

***Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed)*
Bold diagonals are the reliability coefficients.

Using Pearson correlation coefficient, the results showed that in-role performance is significantly related with all components of engagement (r=.341, p<.01 for vigour; r=.323, p<.01 for dedication and r=.308, p<.01 for absorption). On the other hand, only two of the components of engagement are significantly correlated with those of extra-role performance (r=.218, p<.05 for vigour; and r=.174, p<.05 for dedication).There was no significant correlation between absorption engagement and extra-role performance. Overall, there was a significant positive relationship between employee engagement and job performance (r=.391, p<.01). The null hypothesis(H_0) which stated that "Employee engagement and performance are not significantly related" was rejected and it was concluded that employee engagement and performance are positively and significantly related.

Other factors influencing job performance

Effective performance is a very important outcome in any organisation. Therefore, the study also sought to find out from employees' perspective at least two factors that cause poor performance among academic staff in public universities, and many reasons were listed. The outstanding reasons were remuneration, motivation, working environment, multi-skilling, supervision, student-staff ratio, hash administrative policies and lack of regular performance appraisal.

Submissions on remuneration and motivation ranged from delayed or late payment of staff salaries and allowances, recognition issues, a poor rewarding system, delayed promotions and lack of additional institutional training. A conducive working environment was another predictor of effective performance that was mentioned. Inadequate facilities/infrastructure, such as small office space, poor interpersonal relationships at work, little or no facilitation in areas with poor internet connectivity, lack of a public address system for lecture rooms and funding for research, among others, greatly hinder high performance. Multi-tasking was another factor that was identified. This has to do with one's ability to perform many tasks at a time. This is good but it can lead to errors and wastage of time at some point. Poor performance is due to having several other jobs outside that take up a significant amount of one's time and yet pay better, but impose conflicting demands such as the need to regularly be away to do consultancy work, as opposed to lecturing.

Supervision was yet another factor that the respondents indicated as contributing to poor performance. Poor supervision leads to low performance levels, burnout and conflict. The respondents claimed that some supervisors were authoritarian, disrespected those they supervised, were egoistic and offered little help to those they supervised. It is important to have supervision provided by good supervisors who are tolerant, flexible and fair, who give feedback and communicate effectively.

Discussion, Conclusion and Recommendations

Discussion

Employee engagement

The first research question was: "What are the levels of employee engagement among Makerere University academic staff?"

The findings revealed that the majority of the respondents scored high on engagement, as illustrated by the frequencies and percentages in agreement with the items, specifically on all the three components of vigour, dedication and absorption. However, absorption was slightly low. The majority agreed that they were enthusiastic about their job, a very good indicator of dedication, while most also agreed that they were immersed in their work, which was a good indicator of being

absorbed. Furthermore, only three items scored less than expected, and the rest were above average, indicating a high level of engagement. Furthermore, the findings revealed that they were proud of the work that they did, which meant that chances were high that they would keep engaged both physically and emotionally. The reason for such findings could be that the academic staff have passion for the work they do and have positive emotions hence are dedicated, absorbed and have a lot of energy or vigour to perform their tasks, and that there could be some level of satisfaction despite some challenges that do exist.

The findings with regard to engagement are in line with the arguments of other scholars(Macey & Schneider, 2019;Ologbo&Sofian, 2013;Koffman, 2002),who have pointed out that engaged employees have passion and energy about their work and are more absorbed in that they just realise time has passed. Also, engaged employees take pride in the work they do and will always put in extra time to get tasks completed to a good standard or as expected, are aware of the business context and work with colleagues to improve performance within the job for the benefit of the organisation. The findings are also in line with those by Schaufeli et al. (2008), who point out that engaged employees are energetic and connected with their work activities and feel they are capable of accomplishing these duties properly. The findings are, however, contrary to the Gallup report (2013), as cited in Karanges et al (2014), which found that 11% of employees were engaged worldwide in their jobs, 62% were not engaged and only 27% were actively disengaged. The study findings are also not in line with those of Blessings and White (2011), as cited in Shmailan(2016), who conducted a study in India in 2010 to determine the levels of employee engagement, and the results revealed that younger employees were less engaged while banking employees were low on engagement.

From the foregoing results, therefore, the research question which focused on levels of employee engagement was adequately answered. Levels of engagement are high among the academic staff at Makerere University.

Job performance

The second research question stated: "What are the levels of job performance among Makerere University academic staff?"

The findings of the study revealed that, overall, extra-role and in-role performance was high, with in-role performance being slightly higher, as seen in the frequencies, percentages as well as correlation results. Only one item scored below 50% in agreement, i.e. regarding taking underserved work breaks, where the majority disagreed with the statement. This is a good indicator that academic staffs only take deserved work breaks, hence eliminating issues of unexplained absenteeism from work. Furthermore, the findings revealed that all the respondents agreed that they had the skills and expertise to perform their job-related tasks. Also, they agreed that they helped their colleagues who were absent from duty, which was a good indicator of extra-role behaviour and performance. The reason for these findings could be that the respondents are proud of the work they do and have the required skills, expertise and cognitive ability to perform their duties. Furthermore, they could be having a high degree of autonomy in planning how to implement their duties. Other scholars (Banks, 2006;Harter, Schmidt, & Keyes, 2002) agree with these findings in that they associate performance with low absenteeism, hence fulfilling all their daily duties. Also, in line with these findings are Bedarkar & Pandita, (2014) who argued that engaged employees extend their engagement to others by offering extra help to achieve their tasks. Engaged employees perform and will always seek to help others which improves on team performance.

Employees' levels of performance were fairly high and this meant that the academic staff were performing their responsibilities normally and to the best of their expectations. Therefore, this research question was equally answered.

Employee engagement and job performance

The null hypothesis (Ho) states that employee engagement and job performance are not significantly related.

The findings revealed that, overall, there was a significant relationship between employee engagement and job performance($r=.391$, $p<.01$). This meant that the scores in one variable, engagement, influence or affect the other variable, performance. These findings are not in line with most of the research findings by other researchers because several studies have related work engagement to both task and contextual performance (Bakker et al., 2004)burnout, and (other-ratings of. The findings are in agreement with those by Halbesleben and Wheeler, (2008b), whose results showed that work engagement had a significant semi-partial correlation with self-rated, supervisor, rated and co-worker rated performance. This meant that work engagement had a relatively small effect on employee performance.

In support of these research findings, other scholars (Chughtai & Buckley, 2011it seeks to investigate the mediating role of learning goal orientation in the relationship between work engagement and two forms of performance: in-role job performance and innovative work behaviour. Design/methodology/approach: Data for this cross sectional survey study were collected from 168 research scientists drawn from six Irish science research centres. Structural equation modelling was used to test the research hypotheses. Findings: The results suggest that both trust in supervisor and trust propensity were positively and significantly related to work engagement. Additionally, results indicate that learning goal orientation partially mediated the effects of work engagement on in-role job performance and innovative work behaviour. Research limitations/implications: This research was limited by two main factors: the cross-sectional research design, and use of self-reported questionnaire data. Limitations aside, this study provides evidence that a climate of trust can fuel work engagement, which in turn, is likely to promote learning, innovation and performance. Originality/value: This paper extends the developing engagement literature in two ways. First, it empirically establishes an association between two facets of trust and work engagement. Second, it highlights the role of learning goal orientation in explaining the linkage between work engagement and job performance. (PsycINFO Database Record (c; Demerouti & Cropanzano, 2010) argued that the link between employee engagement and performance is not straightforward or clear but rather complex in the sense that various mechanisms may account for the relationship between the two variables. Furthermore, Demerouti (2006)addsthat personality traits such as goal directedness and conscientiousness may be instrumental in qualifying the relationship between work engagement and job performance. Even Kirk-Brown and Van Dijk (2011)the current study examined the relationship between work engagement, perceptions of psychological safety at work and the performance of organisational citizenship behaviours for employees with chronic illness (N = 92 are in agreement with these findings. They investigated the relationship between work engagement and performance among 604 employees in Australia and, of these, 92 had chronic illnesses. There findings show that work engagement has a positive relationship with performance for both groups, meaning that engaged employees always perform better.

Sendawula, et al., (2018) also found in their study that there was a significant positive relationship between employee engagement and performance, implying that a positive change in employee's engagement leads to a positive change in job performance. Similar results indicating a positive significant correlation between work engagement and in-role performance were obtained from Jackson's (2014) study, only differing in the fact that even the results of extra-role performance and engagement were positively significant.

In conclusion, the null hypothesis was rejected and the alternative hypothesis that employee engagement and job performance are significantly related accepted.

Other factors influencing engagement and job performance

The findings revealed that the majority of the respondents pointed out that pay, motivation and remuneration greatly influence performance in that their absence leads to poor performance and their presence increases performance. This is supported by other researchers (Hagopian et al. 2009, Hughes et al.,2002; Kamery,2004;Ekerman,2006),who found that the amount of remuneration provided, ways in which employees are paid, and the provision of other incentives, motivate employees and increases their performance levels.Furthermore, the World Health Organisation (WHO, 2006)argues that health workers, for instance, must be paid reasonably well for the work they do.

The quality of supervision was the second outstanding factor that the respondents pointed out as also greatly leading to poor productivity. This is in line with Rowe et al.'s (2005) argument that supportive supervision greatly impacts on performance and, when combined with appraisal feedback, greatly improves productivity. Additionally, the styles of supervision used by employers helps in reducing conflict, increases confidence and, consequently, increase performance levels (Gallup, 2003; Hagopian et al.,2009).For example, good supervision in Ghana brought about great change in staff motivation and performance in both public hospitals and quasi-autonomous hospitals (Dovlo, 1998).

Lastly, a good working environment promotes satisfaction and comfort and, consequently, encourages performance because there is absence of physical stress, and facilities as well as other job-enabling necessities are present. These are in agreement withNgetheIravo and Namusunge's (2012) findings.

Conclusion

The results of this study contributed to the existing literature in that the levels of engagement among academic staff were reported to be high. Engagement is an important factor in an organisation because highly engaged employees always contribute significantly to the success of the organisation and ensures that the employees are always enthusiastic and have the passion to do their job/tasks. Therefore, engagement strategies should always be put at the core of every employers' plan if the set goals and objectives are to be met.

Secondly, having a productive or performing workforce is equally a good indicator of a competitive organisation. The results of the study indicated that academic staff responded "fairly high" on job performance, which is good for the university. Therefore, it is always important for the administration to involve individual employees in setting goals and objectives so as to maintain high performance and that there is good, timely and reasonable feedback with the aid of an acceptable performance appraisal.

Recommendations

From the findings in the study, the following recommendations were deemed necessary;

The central university administration, school deans and principals should develop new strategies for maintaining the engagement levels while focusing on the most urgently needed resources, such as early and timely payment of salaries and arrears and appropriate recognition. They should also avoid delays in promotions and ensure that academic staff offices have good, reasonable furniture and enough space to work, among others.

Furthermore, the university administration needs to not only engage staff heads like heads of departments, deans and principals, but also individual staff to give their opinions on certain university policies, especially if they regard issues that touch them individually, because the heads may not express their challenges as well as the staff would. Soliciting employees' voice in matters of policy formation would go a long way in improving communication between management and academic staff which would, in turn, enhance engagement and, therefore, performance.

Good and effective performance is an important desired end goal for every organisation. Section heads, on behalf of the administration, should coordinate the formulation of an appropriate, acceptable, transparent and well-scheduled performance appraisal exercise that eventually gives timely feedback on areas achieved and those that need improvement. Appropriate and timely feedback from appraisals or one-to-one evaluation is important.This helps in the designing of better strategies to tackle the identified obstacles to performance.

The issue of staff-student ratios is not an easy one to find an immediate solution to, especially considering that most students prefer public universities. There is need to at least install durable loud speakers, especially in lecture rooms that accommodate big numbers of students, so as to aid students' ability to get clear and audible explanationsThis would greatly impact on the understanding of particular concepts that are explained during lecture sessions.

The stakeholders in the Human Resource Department, heads of department, school deans and principals should always develop and approve new engagement strategies that will strongly aid in influencing performance at all levels. Engagement of employees solely depends on their levels of satisfaction with the existing policies, their working environment, the reward and recognition policy, timely pay of salaries and incentives. If these are properly done, employees will feel comfortable, hence engaging the more and eventually maintaining their performance levels.

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Satisfaction with Human Resource Management Practices and Job Performance of Academic Staff in Public Universities in Uganda: A Case of Kyambogo University

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Abstract

The quality of job performance of employees, regardless of context, cannot be any better than the quality of Human Resource Management Practices (HRMPs) at the place of work. This cross-sectional survey study provides insights regarding the relationship between satisfaction with HRMPs and the job performance of academic staff in public universities in Uganda. The study comprised a sample of 198 from a population of 406 full-time academic staff of Kyambogo University. Data was collected using a questionnaire and analysed using SPSS for descriptive analysis and SmartPLS for Structural Equation Modelling (SEM). Descriptive results showed that teaching performance was high while research and publication and community service performance were moderate. The results revealed that satisfaction with placement, development, engagement and talent retention HRMPs was moderate while satisfaction with human resource (HR) recruitment was slightly high. Overall, job performance was high while satisfaction with HRMPs was moderate. SEM revealed that while HR recruitment practices and placement had a positive significant influence on job performance, the influence of HR development, retention and engagement practices was insignificant. It was concluded that high and moderate satisfaction of academic staff with HR recruitment and placement, respectively, is imperative for their job performance. However, moderate satisfaction with HR development, engagement and talent retention practices impedes job performance of academic staff. This study recommended that university managers should ensure that HR recruitment and placement practices implemented provide satisfaction to academic staff. University managers should also ensure that satisfying HR development, engagement and talent retention are designed and implemented.

Keywords: *Academic staff; Human Resource Management Practices; Job performance; Public University; Satisfaction*

Introduction

Job performance of academic staff centres on three main roles on which universities are founded, and these are teaching, research and publication, and interaction with society or community service. However, on all the three central mandates of academic staff, performance remains low in public universities in Uganda (Mugizi, 2018). With respect to teaching, the criticism is that the quality of teaching is low, with academic staff not using appropriate teaching methods such as the student-centred teaching approaches that engage students but instead the easy-to-implement teacher-centred practices which involve reading out of content to students, thus promoting memorisation of content and hindering critical thinking, which thwarts skills development among students (Muganga & Ssenkusu, 2019). Academic staff are also accused of interacting with students for only half of the expected contact hours, absenting themselves and being inconsistent in attending to classes (Atwebembeire et al., 2018). A number of academic staff also exhibit lack of commitment to excellence by failing to accurately mark examinations but, instead, create fake marks and cheat examinations for students, and others fail to prepare for lectures but rely on plagiarised online notes (Mugizi et al., 2015). Most of the academic staff involved in supervising postgraduate research show low commitment to it, with the majority of students failing to graduate in time or complete the programmes (Muriisa & Bergen, 2015; Oyugi, 2020). For instance, while at master's degree level over 70% of graduate students successfully complete the classroom phase on time, the average completion rates stand at less than 30% (Malunda et al., 2021).

With regard to research, the performance of academic staff in Ugandan universities is also low, with limited academic research publication and inability to attract and win research projects (Rwothumio et al., 2020). The high-performing academic staff in terms of research and publication are those of Makerere University, with an average of two publications in 10 years per academic member of staff out of the total number of permanent staff, which is still very low (Cloete et al., 2018). In relation to community service, while universities in Uganda recognise it as part of the university function, the number of academic staff engaged in it is very low. Notwithstanding the iterative calls for and discourses on community engagement and outreach in universities, even research on the subject in Uganda is rare in literature (Musinguzi et al., 2016). Nanyanzi et al. (2021), in a study involving academic staff in higher education institutions, found that in Uganda faculty members hardly ever got engaged with communities because of the many course units they taught and other teaching-related activities, including handling coursework as well as administering tests and examinations.

Strategies that universities employ to promote job performance of academic staff include HRMPs (Emeribe, 2020), leadership (Jameel & Ahmad, 2019), promoting job satisfaction, organisational culture, staff motivation, employee engagement and establishing a better workplace environment (Theresia et al., 2018; Wahyudi, 2022). However, in the recent past, the management of Kyambogo University, which is the context of this study, has made pronouncements pertaining to HRMPs which have attracted an outcry from academic staff as being unfair and likely to stifle academic staff commitment and thus affecting job performance. A case in point is the issuance, on 3rd July 2022, of a circular by the Director HR to academic staff declaring that the promotion of academic staff would only follow internal advertisement of vacant positions. Another circular, issued on 20th July 2022 by the Vice Chancellor, indicated that for promotion to take place, staff would be informed through their respective heads of departments about promotional positions that have fallen or would fall vacant in a financial year. These pronouncements ran counter to the provisions in the HR manual (Kyambogo University Human Resource Manual, 2014) which stipulates the development

requirements for academic staff, which include having the necessary qualifications in a relevant discipline, publications, contribution to community service and supervision of graduate students.

Further, at Kyambogo University, many academic positions remain vacant, creating high work overload (Kyambogo University Staff Establishment, 2022), the recruitment process is unsatisfactory (Rwothumio et al., 2016) and HR development, engagement and retention practices are poor because of lack of a coherent staff development system, characterised by the challenges of lack of adequate training, inappropriate training, good development policy (Kasule & Abooki, 2014) and appointment and removal of academic staff without adhering to the HR manual and the national guiding Acts, laws and standing orders (Ayebare et al., 2016). The above contextual evidence shows that in Ugandan universities, there is low job performance among academic staff, and particularly for Kyambogo University, there are glaring challenges in HRMPs. This contextual gap prompted this study to investigate academic staff satisfaction with HRMPs and how it influenced job performance among academic staff. Academic staff job performance was operationalized in terms of teaching performance, research and publication, and community service (Abba & Mugizi, 2018). In this paper, HRMPs were operationalized in terms of recruitment practices (Demo et al., 2012; Nieves & Quintana, 2018), placement (Haueter et al., 2003), development (Demo et al., 2012; Nieves & Quintana, 2018) and engagement and talent retention (Mujtaba et al., 2022). Therefore, the study tested the hypothesis to the effect that:

$H_1$1: Satisfaction with HR recruitment practices significantly influences the job performance of academic staff.

$H_1$2: Satisfaction with HRs placement significantly influences the job performance of academic staff.

$H_1$3: Satisfaction with HR development practices significantly influences the job performance of academic staff.

$H_1$4: Satisfaction with HRs engagement significantly influences the job performance of academic staff.

$H_1$5: Satisfaction with HRs talent retention significantly influences the job performance of academic staff.

Theoretical review

The Perceived Organisational Support Theory (POST) by Eisenberger et al. (1986) was the basis for this article. The POST posits that employees develop an overall perception regarding the degree to which institutions care about their well-being and appreciate their contribution (Kurtessis et al., 2017). Therefore, POST is about the employees' overall belief that managers of organisations recognise their work effort and that they are mindful of their wellbeing (Xu & Yang, 2021). The main antecedents of POS include leaders' support, fairness, work conditions and HRMPs (Eisenberger et al., 2020). Employees with a high perception of organisational support, this may result in attitudes such as job satisfaction and commitment to work, leading to greater job performance. Therefore, when workers perceive that their employer is supportive, their job performance effort increases (Kurtessis et al., 2017). The theory portrays a give-and-take concept, suggesting that when employees feel that they are supported by the organisation, they reciprocate with high work effort (Mugizi et al., 2019). The weakness of POST is that when managers treat employees unfairly, organisations are blamed instead of the managers because of the tendency to associate superiors with the organisation. This might affect their work effort, leading to reduced work effort or counterproductive behaviours against the organisation (Neves & Eisenberger, 2014). Significantly, POST generally postulates that when employees receive satisfying support from the organisation, they develop positive work attitudes,

hence higher job performance. Therefore, basing on POST, this study examined whether academic staff satisfaction with HRMPs of the university in terms of HR recruitment, placement, development, engagement and talent retention significantly influenced their job satisfaction.

HRMPs and job performance

Human Resource Management Practices (**HRMPs**) describe a system that attracts, develops, motivates and retains employees to ensure the effective implementation and the survival of the organisation (Ngwenya & Aigbavboa, 2017). These practices, which are designed in line with organisational policies, are implemented to facilitate the human capital of an organisation to contribute to the achievement of its objectives (Mugizi & Bakkabulindi, 2018). The HRMPs include recruitment practices, placement, development, engagement and talent retention (Demo et al., 2012; Haueter et al., 2003; Mujtaba et al., 2022; Nieves & Quintana, 2018). Studies (Al Aina & Atan, 2020; Adaoma & Onuoha, 2022; Ashraf, 2017; Lestari et al., 2020; Mira et al., 2019; Manzoor et al., 2019; Oaya et al., 2017; Sutanto & Kurniawan, 2016) examined the relationship between recruitment and the job performance of academic staff. These studies shed light on the relationship between recruitment and job performance. However, empirical and contextual gaps emerge from the studies above. For instance, Al Aina and Atan (2020) indicated that recruitment did not have a significant relationship with job performance, contrary to the other scholars, which suggested that the position on the two variables needed further investigation. At contextual level, except for the study by Manzoor et al. (2019) done in universities, all the other studies were done outside universities, yet the internal dynamics of organisations other than universities are different, hence the need for further research.

There are scholars (Agbo, 2020; Ekhsan et al., 2020; Eyina & Orlu, 2021; Ihekoronye et al., 2020; Mahmood et al., 2022; Yusuf & Arrywibowo, 2017; Raub et al. 2021) who studied HR placement and employee job performance. One area in which all these studies were consistent was that HR placement practices had a positive and significant relationship with employee performance. These studies indicate that HR placement is essential for job performance. However, the studies raised contextual gaps, with none capturing the Ugandan context and universities, which made it essential that this study be carried out in the context of universities in Uganda. Further, some studies (Al Aina & Atan, 2020; Bibi, 2018; Lee & Lee, 2018; Kareem & Hussein, 2019; Kaewnaknaew et al., 2022; Nguyen & Duong, 2020; Samwel, 2018; Shafiq & Hamza, 2017) investigated the relationship between HR development and employee performance. These studies revealed that efforts have been made to study the relationship between HR development and employee performance. However, these studies revealed contextual, population and empirical gaps. At contextual level, all the studies were done outside Uganda and outside universities. The only study done in a university (Kareem & Hussein, 2019) did not consider academic staff. At empirical level, the studies (Samwel, 2018; Shafiq & Hamza, 2017) contradicted others, indicating that HR development was not related to job performance by employees. These gaps made it imperative for this study to be carried out in the context of academic staff in universities in Uganda.

A number of studies (Afolabi et al., 2022; Al-Omari & Okasheh, 2017; Badrianto & Ekhsan, 2020; Bosire et al., 2021; Hafeez et al., 2019; Oyo-Ita et al., 2020; Stanikzai, 2017; Tabiu et al., 2020; Tran et al., 2018; Udo et al., 2018; Zafar et al., 2017) investigated the relationship between HR engagement practices and job performance. HR engagement practices included practices such as promoting employee autonomy, participation, trust relationships, quality communication and employee recognition, as well as providing a good physical working environment (Mujtaba et al., 2022). The studies above identify essential HR engagement practices for organisations such as

universities. However, none of the studies captured the Ugandan context, while the study by Zafar et al. (2017) indicated that the practice of providing a good working environment had no significant relationship with employee performance, suggesting that the importance of engagement practices is not conclusive. These gaps necessitated the investigations of this study in the context of a university in Uganda.

Further, a number of studies (Davidescu et al., 2020; Kustini et al., 2022; Mughal & Iraqi, 2020; Permana & Bharoto, 2021; Msuya & Kumar, 2022; Sanyal & Hisam, 2018; Soomro et al., 2018; Szostek, 2020; Zikanga et al., 2021) related HR retention practices and employee job performance. HR retention practices include attractive rewards / remuneration, a unique family atmosphere, open communication, respect of staff, promotion of teamwork, good interpersonal relationships, flexible working arrangements, and enabling a work-life balance (Mujtaba et al., 2022). However, empirical gaps emerged from the above studies, with the study by Zikanga et al. (2021) done in secondary schools in Uganda indicating that pay, bonuses and allowances insignificantly influenced teachers' job performance contrary to other studies. On the other hand, Szostek (2020), in a study done in Poland, revealed that work relations differed in private and public sector institutions, with the quality of relations being higher in the private sector, which necessitated ascertaining this in a public institution in Uganda. Therefore, these empirical gaps attracted examination of the relationship between HR retention practices and employee job performance in the context of a public university in Uganda.

Methods

The study adopted the cross-sectional survey design because the data collection time horizon is cross-sectional or short, involving the collection of data about what is going on at that specific point in time (Melnikovas, 2018). The cross-sectional design helped in collecting the survey data necessary for statistical inference since it allows the collection of data using a questionnaire survey (Cohen et al., 2017). The population of the study comprised 406 full-time academic staff of Kyambogo University, from which a sample of 198 academic staff was drawn using the Table for Small Sample Technique by Krejcie and Morgan (1970). The study used the quantitative approach since survey data was collected. This helped in testing whether the independent variable (satisfaction with HRMPs) predicted the dependent variable (job performance of academic staff). Simple random sampling was the technique used to obtain the respondents that provided the data. This gave every academic staff member the chance to participate in the study, enabling collection of the data necessary for generalising the findings. Data was collected from academic staff using a self-administered questionnaire and they were traced in their offices. Data collected from the academic staff because they could easily report on the HRMPs of the university and their own performance.

Measures of the variables

The measures of HRMPs the independent variable were HR recruitment practices (Demo et al., 2012; Nieves & Quintana, 2018), placement (Haueter et al., 2003), development (Demo et al., 2012; Nieves & Quintana, 2018), engagement and talent retention (Mujtaba et al., 2022). The measures of job performance of academic staff the dependent variable were teaching performance, research and publication, and community service (Abba & Mugizi, 2018). The indicators for the constructs were measured using a five-point Likert scale anchor (where 1 = strongly disagree, 2 = disagree, 3 = moderately agree, 4 = agree and 5 = strongly agree). The anchors helped in collecting ordinal data that could be used for quantitative analysis.

Data analysis method

Data analysis involved building models that included measurement models and structural models. The measurement models helped to establish whether the indicators measuring the different constructs were appropriate and consistent. The structural models helped to show the causal linkages between the predictor and criterion variables. SmartPLS 4 for partial least square structural equation modelling (PLS-SEM) was used to construct the models. This was because it had the efficacy to spontaneously generate higher-order constructs and estimate complex models with numerous latent variables. SmartPLS shows predictive links between variables building on strong theoretical support that shows causal relationships. SmartPLS helped to identify the indicators for different constructs and to draw measurement models showing paths between the different variables. The PLS-SEM approach using SmartPLS was relevant as it facilitated testing of the causal-effect linkages in the hypothesised model because the sample was 100 (n = 198) (Hair Jr et al., 2021). Therefore, through using SmartPLS, the influence of satisfaction with HRMPs on job performance of academic staff was revealed.

Findings

This covers the empirical results from the investigations of the study. The results include the demographic profiles of academic staff, measurement models, and structural equation models.

Demographic profiles of academic staff

Table 1 presents results on the demographic profiles of the academic staff that participated in the study. The demographic profiles included the sex, age groups, education levels and academic ranks of the academic staff.

Table 1: Demographic profile

Identification	Category	Frequency	Percent
Sex	Male	133	67.2
	Female	65	32.8
	Total	198	100.0
Age Group	Up to 30 years	9	4.5
	Below 40 years	26	13.1
	40 years and above	163	82.3
	Total	198	100.0
Education Level	Master's degree	41	20.7
	PhD degree	157	79.3
	Total	198	100.0
Academic Rank	Assistant Lecturer	32	16.2
	Lecturer	130	65.7
	Senior Lecturer	24	12.1
	Associate Professor	9	4.5
	Professor	3	1.5
	Total	198	100.0

The data on the demographic profiles of academic staff in Table 1 reveals that the modal percentage (67.2%) was of males while the females were 32.8%. The majority percentage was of those 40 years and above (82.3%) while 13.1% were below 40 years and 4.5% were up to 30 years. Further, the majority percentage (79.3%) was PhD holders while 20.7% were master's degree holders. In addition, the majority percentage (65.7%) of those participating in the study was lecturers, 16.2% were assistant lecturers, 4.5% were associate professors and 1.5%. were professors. The results suggest that academic staff with various demographic profiles provided responses.

Measurement models

Measurement models including AVE, Heterotrait Monotrait (HTMT) Discriminant Validity, and reliability and collinearity were developed. The results are indicated in Tables 2 and 3.

Measurement model 1

The first measurement model includes descriptive statistics, AVE and Heterotrait Monotrait (HTMT) Discriminant Validity. Table 2 presents the results.

Table 2: Descriptive statistics, AVE and Heterotrait Monotrait (HTMT) Discriminant Validity assessment

Constructs	Means	AVE	JPAS	CSP	RP	TP		
CSP	3.13	0.583						
RP	3.38	0.540	0.621					
TP	4.24	0.534	0.215	0.878				
JPAS	3.58		0.167	0.469	0.321			
Constructs	**Means**	**AVE**	**HRD**	**HRE**	**HRP**	**HRT**	**HRR**	**SHRMP**
HRD	2.82	0.580						
HRE	3.36	0.527	0.590					
HRP	3.01	0.518	0.728	0.431				
HRT	3.00	0.522	0.582	0.750	0.488			
HRR	3.58	0.589	0.595	0.387	0.565	0.520		
SHRMP	3.20		0.862	0.807	0.803	0.878	0.713	

Abbreviations: *JPAS = Job Performance of Academic Staff, TP = Teaching Performance, RP = Research and Publication Performance, CSP = community service, HRR= HR Recruitment Practices, HRP = Placement, HRD = Development, HRE = Engagement, HRT = talent retention, and SHRMP = Satisfaction with HRMPs*

The results in Table 2 revealed that, overall, job performance of academic staff was high (mean = 3.58). This was because basing on the five-point Likert scale (where 1 = strongly disagree, 2 = disagree, 3 = moderate agree, 4= agree and 5 = strongly agree) that was used, the mean was close to code 4, corresponding to agreed or high. For the teaching performance aspect, it was reported to be high (mean = 4.24) while community service (mean = 3.13) and research and publication performance (mean = 3.38) were moderate (fair). With respect to satisfaction with HRMPs, overall satisfaction of academic staff with them was moderate (mean = 3.20). While academic staff were satisfied with HR recruitment practices (mean = 3.58), with regard to the other practices, namely HR placement (mean = 3.01), HR development (mean = 2.82), HR engagement (mean = 3.36), and HR talent retention (mean = 3.00), they were moderately or fairly satisfied.

The AVE results in Table 2 testing convergent validity showed that the various constructs were appropriate measures. All EVE values obtained were above the minimum level of 0.5, suggesting that the indicators were appropriate measures of the constructs (dos Santos & Cirillo, 2021). The Heterotrait-Monotrait (HTMT) ratio of correlations tested discriminant validity assessing whether the constructs studied were independent, hence able to predict the dependent variable independently. HTMT is a reflective test that identifies whether measures or concepts in a model are independent, thus their indicators define only a specific construct (Roemer et al., 2021). The Heterotrait-Monotrait ratio (HTMT) correlations obtained (Table 2) satisfied the discriminant validity conditions because values for all the constructs were below the limit of 0.90 (Hair Jr et al., 2021). Therefore, the predictor variables, namely HR recruitment, placement, development, engagement and development, independently predicted the criterion variable of job performance of academic staff (teaching, research and publication and community service performance). Therefore, the results in Table 2 were fit for structural modelling.

Measurement model 2

The second measurement model presents reliability (Cronbach's alpha [α] and composite reliability [CR]) and collinearity [VIF]) results. Reliability tests sought to establish whether the results for the different constructs were fit for structural modelling. Table 3 presents the results.

Table 3: Reliability and collinearity results

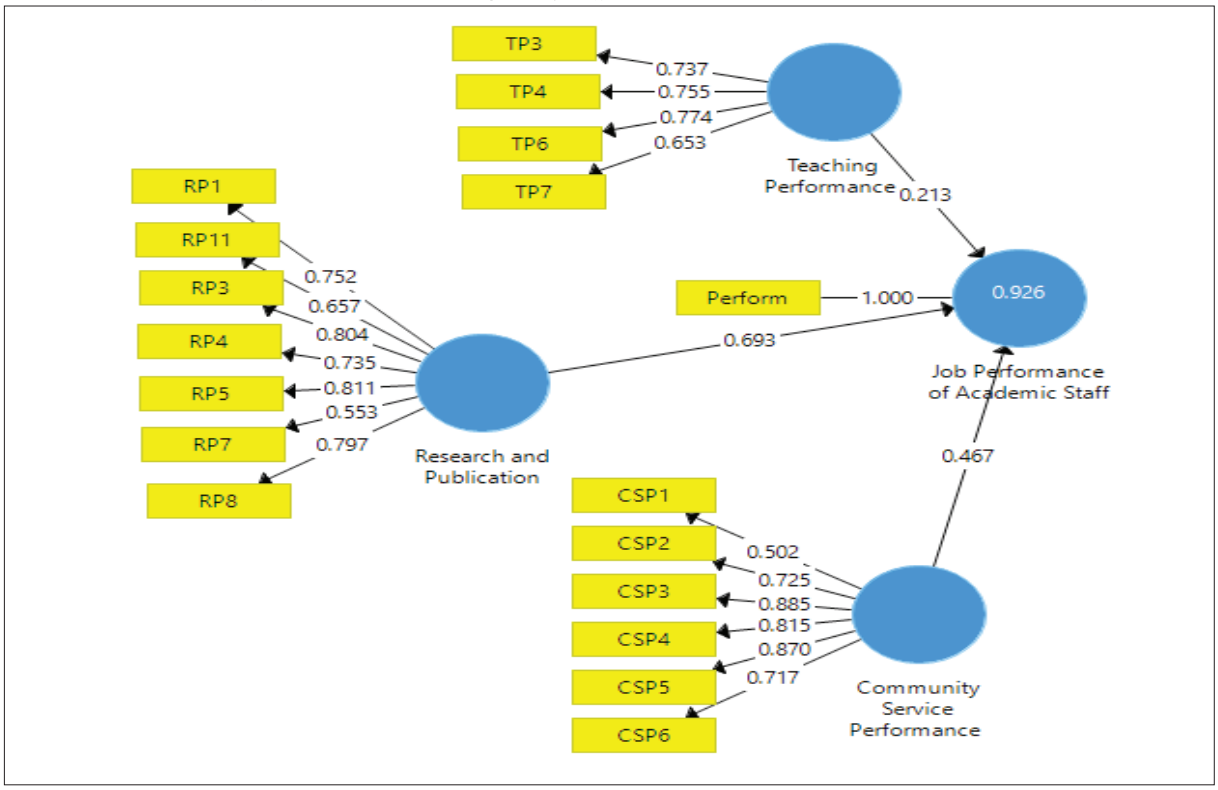
Job Performance of Academic Staff	α	CR	VIF
Community Service Performance	0.851	0.891	1.025
Research and Publication	0.854	0.890	1.086
Teaching Performance	0.710	0.821	1.062
HRMPs	**α**	**CR**	**VIF**
HR Development	0.918	0.932	2.373
HR Engagement	0.847	0.885	1.995
HR Placement	0.882	0.905	1.906
HR Talent Retention	0.897	0.916	2.144
HRs Recruitment	0.825	0.877	1.555

Table 3 shows that reliability tests in terms of Cronbach's alpha (α) and composite reliability (CR) produced values above the threshold of 0.70, which indicated that the measures of the constructs were reliable. In addition, composite reliability was tested because the former is very sensitive, assuming that the traits of the indicators are the same across the population, which lowers reliability values. On the other hand, composite reliability is liberal as it considers outer traits, enabling a higher number of indicators to become reliable (Hair Jr et al., 2021).

Structural model for job performance of academic staff

Data was subjected to structural equation modelling to find out the measures of job performance of academic staff. Figure 1 presents the findings on the job performance of academic staff.

Figure 1: Structural equation model findings for job performance of academic staff

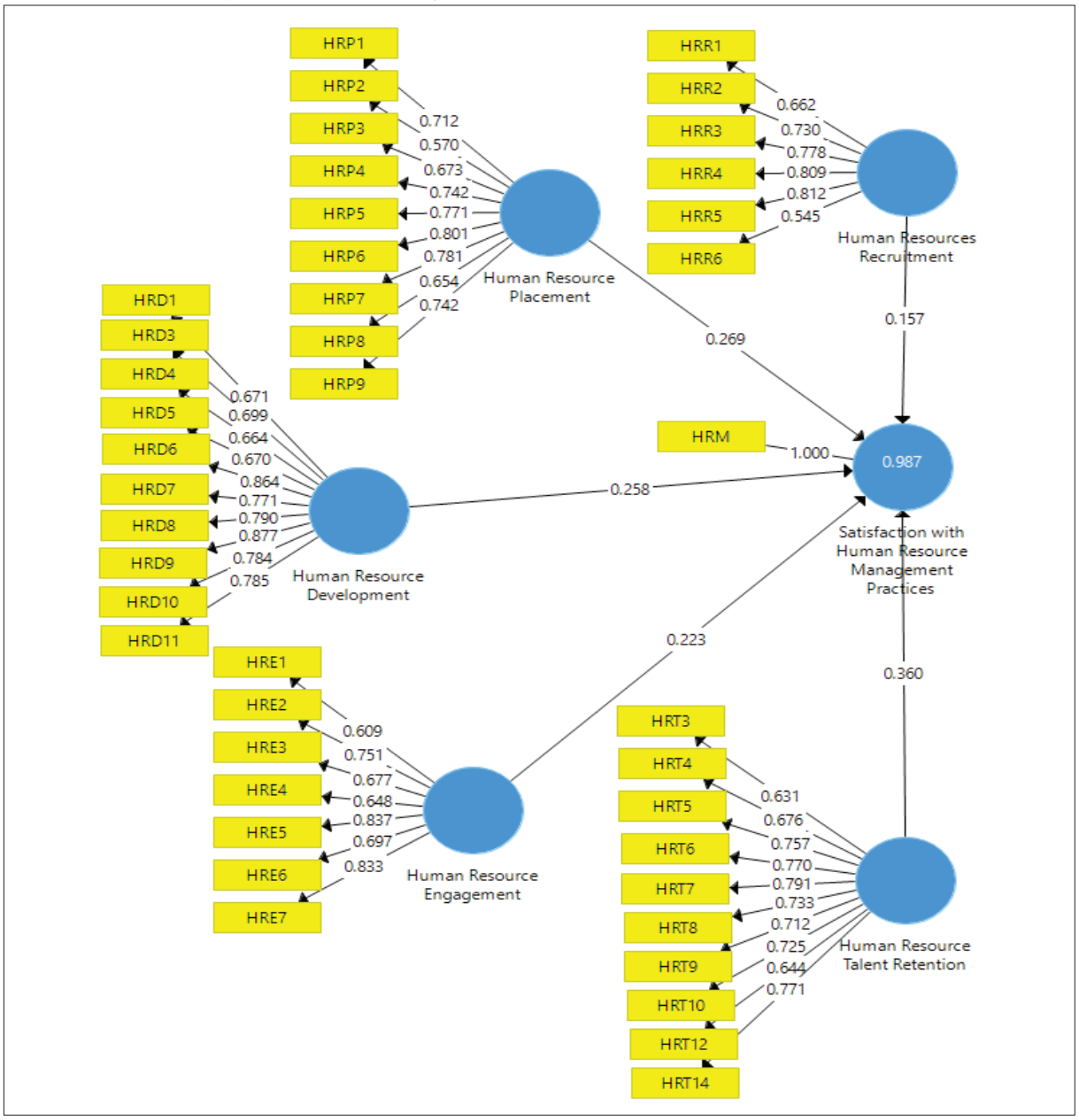


The structural model (Figure 1) for the job performance of academic staff shows that for the construct of teaching performance, four out of 11 indicators measuring the same loaded highly above the minimum value of 0.50 when using factor analysis (Hair Jr et al., 2021). For research and publication, seven out of 11 indicators loaded highly and for community service performance, all the six indicators loaded highly. This meant that the indicators retained for the constructs measuring academic performance in the model were appropriate valid measures of those constructs.

Structural model for satisfaction with HRMPs

Data was subjected to structural equation modelling to establish the measures of academic staff satisfaction with HRMPs. Figure 2 presents the structural equation model findings for HRMPs.

Figure 2: Structural equation model findings for HRMPs

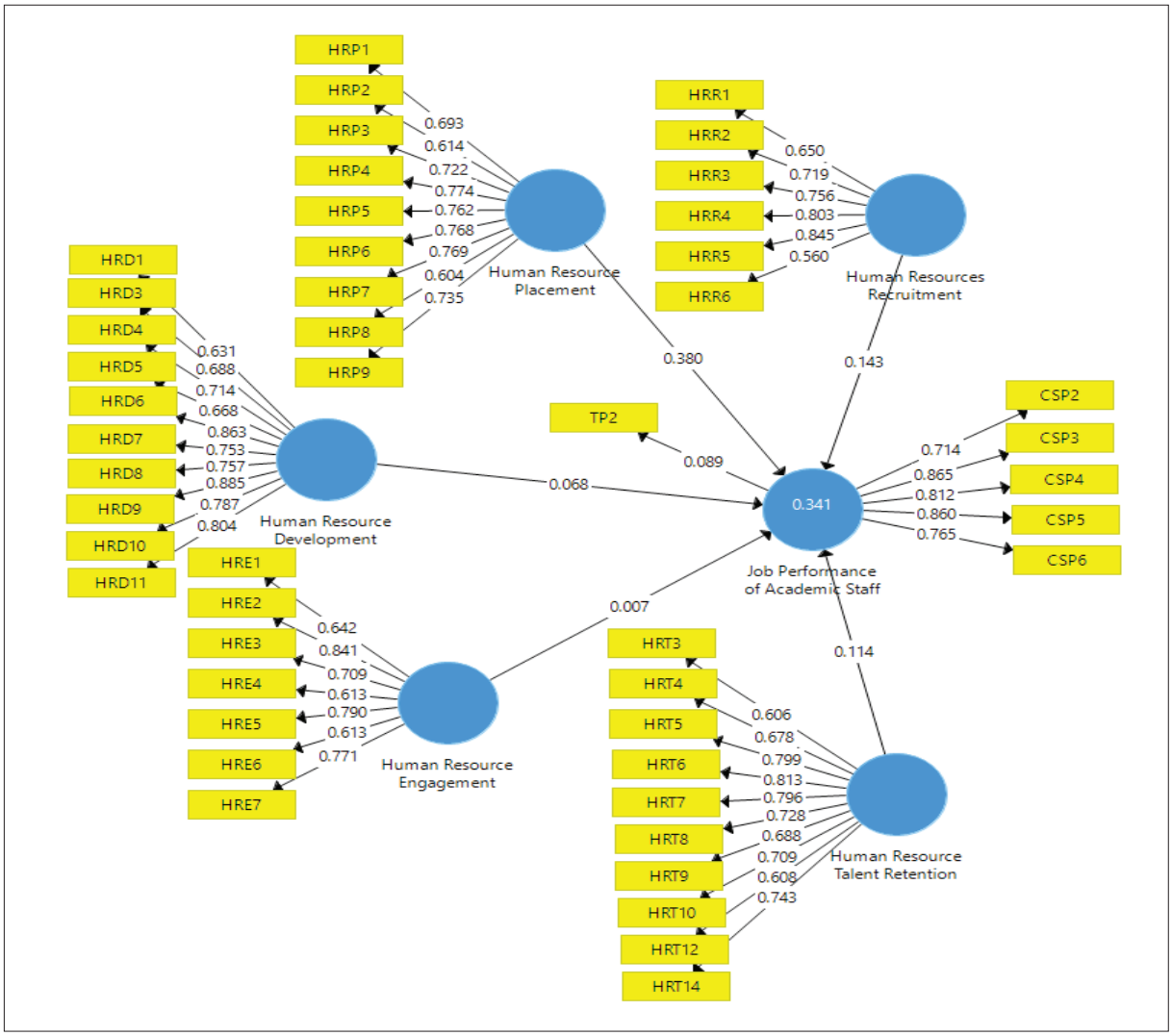


The structural model (Figure 2) for satisfaction with HRMPs shows that for the construct of HR recruitment, five out of seven indicators measuring the same loaded highly above the minimum value of 0.50. For HR placement, all the nine indicators loaded highly, for HR development 10 out of 12 indictors loaded highly, for HR engagement seven out of eight indicators loaded highly and for HR talent retention, 10 out of 14 indicators loaded highly. The model suggested that the indicators retained for the constructs measuring academic performance in the model were appropriate measures of those constructs.

Structural equation model for HRMPs and job performance of academic staff

To establish the relationship between HRMPs and the job performance of academic staff, a structural equation model was carried out. Figure 3 presents the structural equation model findings for HRMPs and the job performance of academic staff.

Figure 3: Structural equation model findings for HRMPs and job performance of academic staff



Since structural models (Figures 1 and 2) confirmed the appropriateness of the constructs measuring satisfaction with HRMPs and job performance of academic staff, a structural model describing the relationship between satisfaction with HRMPs and job performance of academic staff was developed (Figure 3). However, the model showed that only the job performance academic staff concept of community services loaded for the test, suggesting that teaching performance and research and publication did not load in the model. The model results include path coefficients between constructs, coefficients of determination (R^2 and adjusted R^2) and related t statistics and p-values. R^2 examined the model's predictive power. The model involved testing five hypotheses to the effect that satisfaction with HR recruitment practices (H1), HR placement (H2), HR development (H3), HR engagement (H4) and HR talent retention (H5) had a significant influence on the job performance of academic staff. Table 4 presents structural equation model estimates.

Table 4: Structural equation model estimates

		β	T	P
HRs Recruitment	Job Performance of Academic Staff	0.143	1.971	0.049
HR Placement	Job Performance of Academic Staff	0.380	4.414	0.000
HR Development	Job Performance of Academic Staff	0.068	0.595	0.552
HR Engagement	Job Performance of Academic Staff	0.007	0.090	0.929
HR Talent Retention	Job Performance of Academic Staff	0.114	1.179	0.239
$R^2 = 0.341$				
Adjusted $R^2 = 0.324$				

The results in Figure 3 and Table 4 revealed that HRs recruitment (β = 0.143, t = 1.971, p = 0.049 > 0.05) and HR placement (β = 0.380, t = 4.414, p = 0.000 < 0.05) had a significant positive influence on the job performance of academic staff. However, HR development (β = 0.068, t = 0.595, p = 0.552 > 0.05), engagement (β = 0.007, t = 0.090, p = 0.929 > 0.05) and retention (β = 0.114, t = 1.179, p = 0.239 > 0.05) had a positive but insignificant influence on the job performance of academic staff. R^2 suggested that satisfaction with all the HRMPs explained 34.1% (R^2 = 0. 341) of the variation in the job performance of academic staff. Adjusted R^2 indicated that two significant HRMPs, i.e. recruitment and placement, explained 32.4% (adjusted R^2 = 0.324). The coefficient of determination (R^2) suggested that 65.9% of the variation in the job performance of academic staff was accounted for by factors other than the HRMPs implemented. The results implied that while Hypotheses One and Two (H1-H2) were accepted, Hypotheses Three to Five (H3-H5) were rejected.

Discussion

The study examined academic staff satisfaction with HRMPs, namely human resource (HR) recruitment, development, engagement and retention practices in relation to their job performance. The findings indicated that satisfaction with HR recruitment practices positively and significantly influenced the job performance of academic staff. This implies that HR recruitment practices are important for job performance. This is consistent with the findings of previous scholars (e.g. Adaoma & Onuoha, 2022; Ashraf, 2017; Lestari et al., 2020; Mira et al., 2019; Manzoor et al., 2019; Oaya et al., 2017; Sutanto & Kurniawan, 2016). This means that the HR recruitment practices of Kyambogo University enhance the job performance of academic staff. HR placement practices were also found to be positively and significantly associated with the job performance of academic staff. This finding supports the findings of Agbo (2020), Ekhsan et al. (2020), Eyina and Orlu (2021), Ihekoronye et al. (2020), Mahmood et al. (2022), Yusuf and Arrywibowo (2017) and Raub et al. (2021). Therefore, the HR placement practices of the university had an impact on the job performance of academic staff. Nonetheless, the study revealed that the HR development practices had an insignificant influence the job performance of academic staff. This finding concurred with those of Samwel (2018) and Shafiq and Hamza (2017), who reported that HR development was not related to the job performance of employees. However, it did not concur with the findings of most scholars, such Al Aina and Atan (2020), Bibi (2018), Lee and Lee (2018), Kareem and Hussein (2019), Kaewnaknaew et al. (2022) and Nguyen and Duong (2020). This was so because satisfaction of academic staff with HR development practices was moderately low while they considered their job performance high.

This means that when HR development practices are lowly satisfying, the performance of academic staff in universities is negatively affected.

The study findings also indicated that HR engagement practices had an insignificant influence on the job performance of academic staff, which is in agreement with those of Zafar et al. (2017). Nonetheless, the findings were in disagreement with those of most scholars such as Al-Omari and Okasheh (2017), Hafeez et al. (2019), Oyo-Ita et al. (2020), Stanikzai (2017), Tran et al. (2018) and Udo et al. (2018). This was because while performance was rated to be high, engagement practices were rated as moderate. This suggests that when universities provide HR engagement practices that are satisfying, there will be higher job performance. Further, the study indicated that HR talent retention practices had an insignificant influence on the job performance of academic staff, thus concurring with Zikanga et al. (2021). Nevertheless, the finding was contrary to those of most scholars such as Davidescu et al. (2020) Kustini et al. (2022), Sanyal and Hisam (2018), Soomro et al. (2018) and Szostek (2020), who reported the existence of a significant relationship between. This was because, while academic staff rated their satisfaction with retention practices as moderate, they considered their job performance to be high. Therefore, satisfying HR retention practices significantly influence job performance. In the context of Kyambogo University, the influence was insignificant because HR retention practices were considered to be less satisfying by academic staff.

Conclusion

It was concluded that high and moderate satisfaction of academic staff with HR recruitment and placement, respectively, is imperative for their job performance. Satisfying HR recruitment involves wide dissemination of information about recruitment processes, impartial selection, attracting competent people, conducting an intensive selection process and carrying out effective background checks on the candidates. HR placement involves briefing new staff about objectives and goals, helping them know the different departments, as well as the history, operations and values of the organisation. Placement also involves providing information about the organisation's policies, politics, job requirements and general management style. It was also concluded that moderate satisfaction with HR development, engagement and talent retention practices impede job performance of academic staff. HR development practices impede job performance if the appraisal had no strong influence performance and does not advance one's career. HR development practices also impede job performance if there are limited in-house academic staff development programmes, there is limited coaching of new staff, career planning does not facilitate growth and there is low planning for employee growth and progression.

HR engagement practices impede job performance if employee autonomy is limited, participation in decision-making is low, the quality of communication is wanting, there is limited trust and interest in staff, and recognition is low. Further, HR talent retention practices inhibit job performance when rewards are inequitably distributed and inadequate, there is lack of a unique family atmosphere, open communication is limited and subordinates are not encouraged to speak up. HR talent retention practices also inhibit job performance when the ideas and input of staff are not valued, the staff have no chance to meet their superiors in one-to-one sessions, there is limited teamwork, interpersonal relationships are poor, working arrangements are inflexible and there is lack of respect for staff. This study recommends that university managers should ensure that the HR recruitment and placement practices implemented provide satisfaction to academic staff. University mangers

should also ensure that satisfying HR development, engagement and talent retention practices are designed and implemented.

Limitations and Suggestions for Further Research

This study makes contributions by revealing how the job performance of academic staff can be enhanced using HRMPs. However, limitations emerged from the study, with some findings being contrary to what was hypothesised and the findings of most previous scholars. For example, the study revealed that HR development, engagement and retention insignificantly influenced the job performance of academic staff. This makes it necessary for future researchers to further examine the relationship between these HRMPs practices in more universities and other organisations in Uganda to confirm or disconfirm the findings of this study. In addition, this study was carried out in one public university. Therefore, future researchers should extend the study to more universities, including private ones.

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Talent Management: The Game Changer for Work Engagement of Non-Teaching Workforce at Kyambogo University, Uganda

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Abstract

The challenge in public universities in Uganda is that university non-teaching staff are disengaged and take their jobs for granted, hence never make an effort to serve to the satisfaction of students and other stakeholders. This study examined whether talent management strategies employed by the universities were a game changer for work engagement of the non-teaching workforce in public universities. Specifically, the study tested whether talent management in terms of talent attraction, talent development and talent retention had a relationship with work engagement of the non-teaching workforce in public universities. The study employed a correlational research design on a sample of 201 non-teaching staff. Data was collected using a questionnaire survey. The findings revealed that talent attraction and talent development had a positive significant relationship with work engagement of the non-teaching workforce. However, talent attraction had a negative and insignificant relationship with work engagement of the non-teaching workforce. It was concluded that talent attraction strategies in terms of selective recruitment and selection, and talent development in the form of performance appraisal, training and promotion are game changers for work engagement of the non-teaching staff. However, weak retention strategies hamper employee engagement. The study recommends that managers of universities should implement game-changing talent attraction strategies and talent development practices to enhance work engagement of the non-teaching workforce. It is also recommended that university managers should strengthen talent retention strategies to promote work engagement of the non-teaching workforce.

Keywords: *Talent attraction; Development; Management; Retention; Work engagement.*

Introduction

Today, universities globally have been marketised, leading to competition for students (Latif et al., 2021). This competition has necessitated universities to adopt business sector strategies such as customer service to attract students, who are now considered clients (Guilbault, 2018). However, the challenge in public universities, especially in most countries in sub-Saharan Africa such as Uganda, is that university workers have not fully interested themselves in adapting to the business sector customer attraction practices. In public universities, workers are disengaged and take their jobs for granted, hence never make an effort to serve to the satisfaction of students (Kisaka et al., 2019). Therefore, if public universities are to survive in the competitive environment, they need high work engagement amongst their workers. This is because work engagement is fronted in human resource management circles as the magical formula for improving employee performance which, in turn, enhances customer satisfaction in today's cutthroat business environment (Hoole & Hotz, 2016). Al Mehrzi and Singh (2016) contend that work engagement of employees has been propagated as an essential tool for enhancing the competitive advantage of organisations.

Work engagement refers to the high involvement of workers in their work tasks characterised by high drive, alertness and a willingness to put in extra effort to meet work objectives (Khusanova et al., 2021). Work engagement is exhibited by three states of mind – vigour, dedication and absorption (Schaufeli & Bakker, 2004). Absorption pertains to the employee's attitude of getting happily immersed in and focusing on work with time passing rather fast and with the employee finding difficulty in detaching himself or herself from their work (Schaufeli, 2017). Dedication describes the heavy involvement of an employee in his or her work due to the felt challenge, pride and motivation (Vallières et al., 2017). Vigour is the high level of energy, feeling fit and strong, hence being able to work for long periods without getting tired (Kodden, 2020). Operationally, as conceived by Schaufeli and Bakker (2004), in this study work engagement is defined as an employee's attitude exhibited by an employee's vigour, dedication and absorption in his or her work tasks.

Today, across the globe, employee engagement is an issue of concern for leaders and managers in organisations because it is considered to be an imperative component in defining the level of organisational effectiveness, innovation and competitiveness (Bedarkar & Pandita, 2014). Nonetheless, while the work engagement of employees is imperative, amongst Ugandan workers it is low. Ugandan workers do not show vigour while at work, are not dedicated and hardly get absorbed in their work. They have a poor work ethic and serve with no sense of urgency (Clarke, 2017; Jabo, 2017). In 2018, a survey by the Federation of Uganda Employers (FUE) in partnership with Makerere University showed that only 49% of the employees were highly engaged, 6% were disengaged and 45% were moderately engaged. Therefore, those who were disengaged and moderately engaged were 51%, suggesting that the larger percentage of employees in Uganda exhibited engagement challenges (Mugizi et al., 2020a). At Kyambogo University (KYU) where the study was carried out, the work engagement of non-teaching staff was also reported to be low. Non-teaching staff exhibited high disengagement with a high rate of absenteeism and poor service delivery, especially when attending to students (Anyeko, 2016; Kasule & Bisaso, 2016). The workforce lacked vigour in doing work and was not dedicated. As a result, many students failed to register in time, with the workers tossing them up and down. There was also a delay in releasing examination results and in the issuance of transcripts and certificates (Anyeko, 2016). Evaluation reports carried out at Kyambogo University revealed that roughly 60% of its employees failed to accomplish their work targets (Tumuhimbise, 2017).

In their study involving students, administrators, academic staff and support staff of Kyambogo University, Namubiru et al. (2017) claimed that the problems of KYU staff stemmed from poor talent management because of the lack of a shared vision between staff and managers of the university. Accordingly, the university was characterised by maladministration, decadence in governance, and unethical and negligent behaviours (Inspectorate of Government Report, 2015). With the problems of staff of the university blamed on talent management, this study empirically examined whether talent management strategies can be the game-changer for work engagement of the non-teaching workforce. Talent management, which is the methodical process of attracting, sieving, enhancing, engaging, keeping and deploying talented individuals (Gallardo-Gallardo et al., 2020), operationally describes talent attraction, development and retention (Al Aina & Atan, 2020). The following research hypotheses were tested:

H1: There is a significant relationship between talent attraction strategies and work engagement of the non-teaching workforce.

H2: There is a significant relationship between talent development strategies and work engagement of the non-teaching workforce.

H3: There is a significant relationship between talent retention strategies and work engagement of the non-teaching workforce.

Theoretical Review

The Social Exchange Theory (SET), introduced by Homans (1958) and further propagated by Homans (1961), was provided the underpinning for this study. Homans (1958) posits that human relations emerge because of a subjective cost-benefit analysis, with individuals tending to redo actions previously rewarded, and quite often a specific behaviour rewarded in the past is largely likely to recur. Blau (1964) adds that social interactions happen because of the premise that tendencies of good will have to be reciprocated (Chernyak-Hai & Rabenu, 2018). The basic assumption of SET is that individuals such as employees and employers are bound in relationships because of the hope to gain maximum positive value from them (Cortez & Johnston, 2020). The broad notion in SET is reciprocity based on the assumption that good treatment will be repaid (Salas-Vallina et al., 2021). Exchange or reciprocation in social connections is strengthened when both parties are eager to offer each other resources that are beneficial to them (Kuruzovich et al., 2021). Therefore, SET suggests that satisfactory talent management practices generate positive exchanges in the relationship with workers and are reciprocated with positive attitudes and behaviour such as work engagement (Najam et al., 2020; Yin, 2018). Therefore, based on SET, this study examined the relationship between talent management strategies and work engagement of non-teaching workforce in universities.

Talent management strategies and work engagement

Talent management is the identification of the required individuals and maintaining them to propel organisational success (Ansar & Baloch, 2018). Talent management strategies include talent attraction, development and retention (Al Aina & Atan, 2020). Talent attraction is putting the right people in the right jobs and enabling them to maximise their talent for the optimal success of the organisation (Lyria et al., 2017). Attracting candidates that possess higher-level calibre, that are devoted to work and focused on attaining their regular and extraordinary tasks results in having individuals engaged in their job roles (Kerdpitak & Jermsittiparsert, 2020). Talent attraction strategies include selective recruitment and selection (Nazari et al., 2014). Studies (Budriene & Diskien, 2020; Karumuri, 2017; Lewis; 2019; Kerdpitak & Jermsittiparsert, 2020; Nawaz et al., 2020; Sivapragasam & Raya, 2017;

Vuong & Suntrayuth, 2019; Zacher et al., 2015) have been carried out on talent attraction and work engagement. Except for the studies by Vuong and Suntrayuth (2019) and Zacher et al. (2015), which reported the existence of no significant relationship between the selection aspect of talent attraction with employee work engagement, all the other studies indicated the existence of the relationship. This contradiction made it necessary to further test the relationship between talent attraction and work engagement of employees to establish what pertained to the Ugandan context.

Talent development is the second aspect of talent management strategies studied in this article. Talent development is the support that enhances employees' technical knowledge of performing their duties well (Pandita & Ray, 2018). Talent development provides satisfaction to employees as it is regarded as a positive exchange, hence contributing to their development of work engagement (Lee & Eissenstat, 2018). Studies (Ajibola et al., 2019; Aybas & Acar, 2017; Bai & Liu, 2018; Lee & Eissenstat, 2018; LeVan, 2017; Morethe et al., 2020; Mugizi et al., 2020b; Pandita & Ray, 2018) examined the relationship between talent development and employee engagement. However, contrary to other scholars, Lee and Eissenstat (2018) and Morethe et al. (2020) reported that talent development opportunities had no significant relationship with work engagement of employees. This means that an empirical gap still existed as studies were not unanimous on the relationship between talent development and employee work engagement. This necessitated ascertaining the relationship between the variables in the context of public universities in Uganda.

Talent retention strategies are the third component of talent management that were considered in this study. Talent retention strategies involve quality incentives, organisational norms and values and retention policies (Veloso et al., 2014). Shibiti (2020) revealed that the implementation of practices that discourage employees from leaving the organisation leads to their work engagement. In their studies, scholars (Al Mehrzi & Singh, 2016; Brenyah & Obuobisa-Darko, 2017; Hoole & Hotz, 2016; Kang et al., 2020; Mugizi et al., 2020b; Victor & Hoole, 2017) related talent retention strategies and work engagement. However, while all the other studies indicated the existence of a significant positive relationship between the variables, Al Mehrzi and Singh (2016) reported the contrary regarding the talent retention strategy of incentives. Therefore, the relationship between incentives and work engagement is not definite, creating the need for the study in the context of Uganda.

Methods

The study employed a correlational research design to ascertain the relationship between talent management and the engagement of non-teaching workforce of public universities. Therefore, quantitative data relating variables to establish relationships existing between them was collected. This is because correlational studies involve the testing of relationships between variables in the same population (Queirós et al., 2017). The findings obtained based on the design helped to determine the extent to which the independent and dependent variables changed together. Data was analysed using quantitative methods because correlational studies are quantitative in nature. The simple random sampling procedure by which every individual in the population has an equal chance of participating in the study was used to select the respondents. This was because the procedure would help in producing generalisable findings. A sample of 201 non-teaching workforce, including administrative and support staff of Kyambogo University, provided data from a population of 417. The sample comprised 53.7% females and 46.3% males. The larger percentage (47.8%) was 40 years old and above, 32.3% were 30 but below 40 years in age, and 19.9% were up to 30 years old. The

larger percentage (39.6%) had worked for more than 10 years, 37.8% for five but less than 10 years, 18.4% for one but less than five years, and 4.0% for less than one year.

Measures of the variables

The study variables were talent management strategies (independent variable) and work engagement (dependent variable). The measures of talent management were talent attraction, development and retention. Talent retention covered selective recruitment while talent development comprised performance appraisal, training and promotion (Tizikara & Mugizi, 2017) and talent attraction was measured in terms of quality incentives (Mugizi & Bakkabulindi, 2018), organisational norms and values (Akhan-Çağırtekin & Aküzüm, 2020) and retention policies (Kyndt et al., 2009). The measures of the dependent variables were vigour, dedication and absorption (Schaufeli et al., 2006). The indicators of the constructs were based on a five-point Likert scale anchor (where, 1 = Strongly disagree, 2 = Disagree, 3 = Undecided, 4 = Agree and 5 = Strongly agree). Before reduction, the indicators of the constructs were selective (six), recruitment and performance appraisal, training (seven) respectively, and promotion (six), while quality incentives, norms and values had eight, respectively. Indicators for the dependent variable were vigour (six), dedication (five) and absorption (six).

Data analysis method

Partial least square structural equation modelling (PLS-SEM), specifically SmartPLS 3 software, was used in carrying out the study because it has the efficacy to spontaneously generate higher-order constructs and estimate complex models with numerous latent variables. SmartPLS reveals predictive links between variables based on strong theoretical support indicating causal associations. SmartPLS made it possible to identify the indicators of the different constructs and draw measurement models showing links (paths) between the different variables (Sarstedt et al., 2017).) The PLS-SEM approach involving SmartPLS was relevant as it enabled testing of the cause and effect linkages in the conjectured model because the sample was 100 (n = 201) (Hair Jr et al., 2021). Thus, SmartPLS helped in showing the relationship between talent management and work engagement.

Findings

This section presents the empirical results of the study. The results include measurement models, the structural equation model and the path model.

Measurement models

To ascertain whether the constructs were appropriate for structural modelling, structural evaluation models (Tables 2 and 3) testing validity in the form of convergent and discriminant validity were developed. Structural evaluation modelling also included reliability, average variance extracted, collinearity and reliability tests aimed at confirming interrelatedness in indicators of the constructs, which included Cronbach's alpha (α) and composite reliability. The validity tests aimed at establishing whether the constructs were independent, hence able to measure the dependent variable independently. Convergent validity or the extent of confidence that a construct is described by its indicators involved testing average variance extracted (AVE). The findings revealed that variations in the indicators were explained by the constructs. This is because the AVE values indicated in Table 2 were significantly above the limit of 0.5 (Hair et al., 2019). A discriminant validity test was done using a Heterotrait-Monotrait (HTMT) ratio of correlations. HTMT is a reflective test that enables

one to establish whether concepts or measures in a model are independent, which suggests that indicators of each construct actually measure it (Roemer et al., 2021). Table 2 reveals that Heterotrait-Monotrait ratio (HTMT) correlations satisfied the discriminant validity condition, as all the values were less than 0.90 (Franke & Sarstedt, 2019). Hence, the indicators were appropriate measures of the constructs, enabling further analysis.

Table 2: AVE and Heterotrait-Monotrait (HTMT) discriminant validity assessment

Measures	AVE	TA	TD	TR	WE
TA	0.542	0.736			
TD	0.511	0.314	0.715		
TR	0.553	0.271	0.715	0.744	
WE	0.532	0.556	0.572	0.404	0.729

Abbreviations: *TA = talent attraction, TD = talent development, TR = talent retention, and WE = work engagement.*

Reliability tests aimed at confirming the interrelatedness in indicators of the constructs were done (Table 3). The reliability tests included Cronbach's alpha (α) and composite reliability. The Cronbach's alpha (α) and composite reliability (CR) values obtained for the different indicators measuring the constructs were higher than 0.70, suggesting an adequate level of reliability. Composite reliability was included because Cronbach's alpha erroneously assumes that all indicator traits are similar in the population, thus reducing reliability values. Composite reliability is liberal as it considers the outer traits of the indicator variables (Hair Jr et al., 2021). Also, test results showed that there was no collinearity (high association) between the independent variables because the values for variance inflation factor (VIF), the standard metric for measuring collinearity, were less than 5 (Marcoulides & Raykov, 2019). This implies that the predictor variables (talent attraction, development and retention) independently predicted the dependent variable (work engagement).

Table 3: Reliability, average variance extracted and collinearity

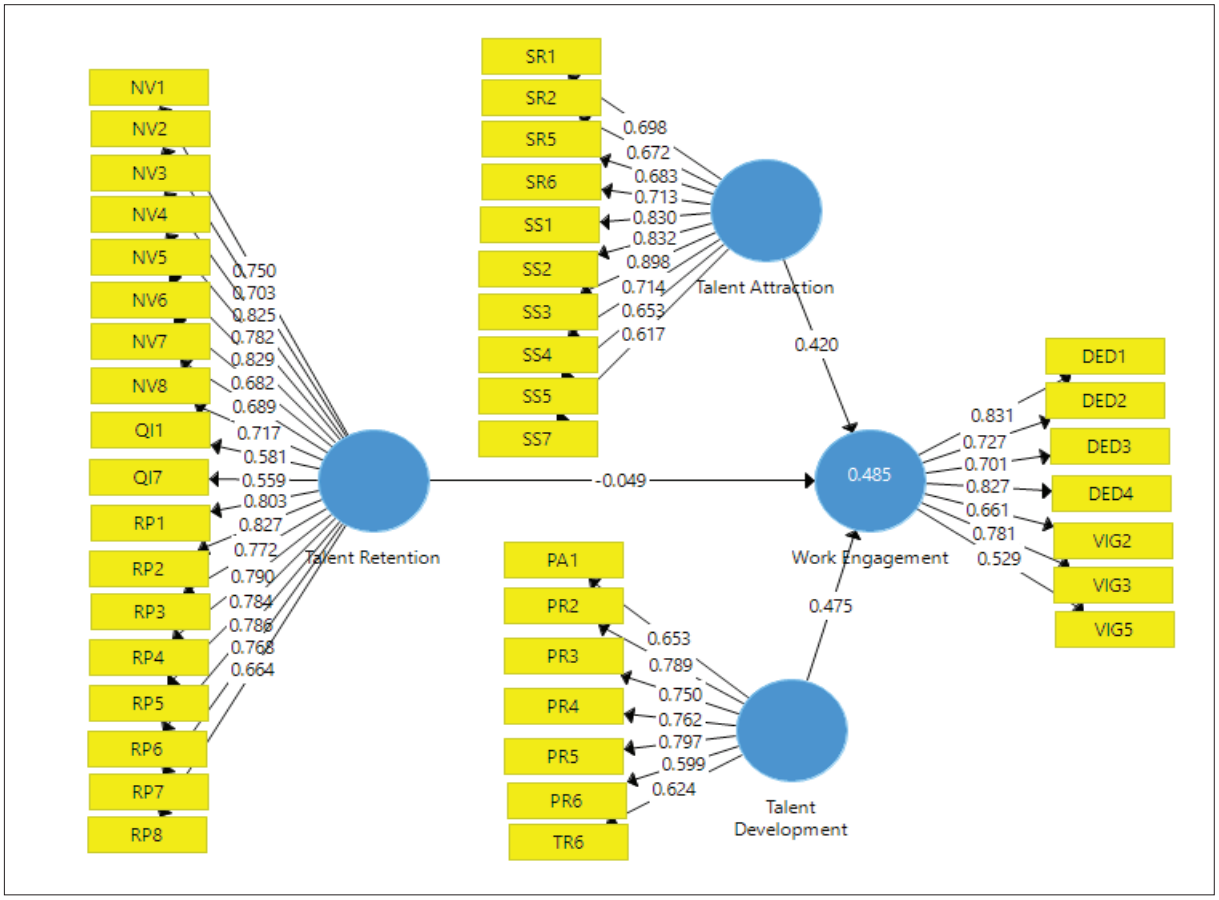
Measures	α	CR	VIF
TA	0.905	0.921	1.115
TD	0.847	0.878	2.113
TR	0.953	0.957	2.055
WE	0.848	0.886	

Structural equation model

After confirming that the measures of the constructs were appropriate, a structural model figure (Figure 1) depicting factor loadings and showing the relationship between the constructs was developed. The results in the figure include path links, betas (βs), p-values and coefficient of determination (R^2). R^2 assessed the model's predictive strength. The model involved testing three hypotheses to the effect that there is a significant relationship between talent attraction strategies and work engagement of the non-teaching workforce in public universities (H1), there is a significant relationship between talent development strategies and work engagement of the non-teaching workforce in public universities (H2), and there is a significant relationship between talent retention

strategies and work engagement of the non-teaching workforce in public universities (H3). Table 3 and Figure 1 illustrate the relationship between the variables.

Figure 1: Structural equation model results



Key: *DED= dedication, NV = norms and values, PR = promotion, RP = retention policies, QI = quality incentives, SR = selective selection, SS= selective selection, TR = training, and VIG = vigour.*

Factor loadings in Figure 1 indicate that for the independent variable of talent attraction conceptualised in terms of selective recruitment and selection, for recruitment indicator 4 was dropped while for selection indicator 6 was dropped. For the independent variable of career development, one indicator of performance appraisal (PA1) was retained, with all of them being dropped, while for promotion five indicators were retained, with one being dropped (PR1); and for training, one indicator (TR6) was retained and the rest dropped. For the independent variable of talent retention, all the items for norms and values were retained (NV1-8), only two indicators (Q1 and Q7) were retained for quality incentives, with the rest dropped and for retention policies, all the eight indicators (RP1-RP8) were retained. For the dependent variable of work engagement, all the indicators for the construct of absorption were dropped, and for dedication, four indictors (DED1-DED4) were retained, with indicator five (DED5) being dropped. With regard to vigour, out of six only three indicators (VIG 2, VIG3 and VIG5) were retained with three indicators (VIG1, VIG4 and VIG6) dropped. The indicators retained were those that loaded highly above the minimum value of 0.50 (Hair Jr et al., 2021). The indictors retained for the various constructs are illustrated in Figure 1.

Table 4: Structural equation path model

		β	Mean	STD	t	p
Talent attraction	Work engagement	0.420	0.416	0.061	6.870	0.000
Talent development	Work engagement	0.475	0.473	0.064	7.449	0.000
Talent retention	Work engagement	-0.049	-0.037	0.055	0.886	0.376
$R^2 = 0.485$						
Adjusted $R^2 = 0.477$						

The findings in Figure 1 and Table 4 indicate that talent attraction ($\beta = 0.420$, $t = 6.870$, $p = 0.000 < 0.05$) and talent development ($\beta = 0.475$, $t = 7.449$, $p = 0.000 < 0.05$) had a positive significant relationship with work engagement of the non-teaching workforce. However, talent attraction ($\beta = -0.049$, $t = 0.886$, $p = 0.376 > 0.05$) had a negative and insignificant relationship with work engagement of the non-teaching workforce. Therefore, hypotheses one (H1) and two (H2) were supported while hypothesis three (H3) was rejected. R^2 suggested that combined, talent attraction strategies, development and retention explained 48.5% ($R^2 = 0.485$) of the variation in work engagement of the non-teaching workforce. Adjusted R^2 indicated that the two significant talent management strategies of talent attraction strategies and development explained 47.7% (adjusted $R^2 = 0.477$). The coefficients of determination (R^2) suggested that 51.5% of the variation in work engagement of the non-teaching workforce was accounted for by other factors than talent management. Further, the means show that for talent retention they were very low (negative). Therefore, talent retention strategies were weak.

Discussion

The results showed that talent attraction strategies (selective recruitment and selection) positively and significantly related to work engagement of the non-teaching workforce. This finding was consistent with the findings of previous scholars (Budriene & Diskien, 2020; 2016; Karumuri, 2017; Lewis; 2019) that the talent attraction strategies had a positive association with employee engagement. The finding was also supported by different scholars (Kerdpitak & Jermsittiparsert, 2020; Nawaz et al., 2020; Sivapragasam & Raya, 2017), who revealed that the talent attraction strategy of selection was positively significantly associated with employee work engagement. Nonetheless, the finding was inconsistent with those of Vuonga and Sida (2020) and Zacher et al. (2015), who reported that selection had no significant relationship with employee work engagement. However, with the findings of the study being consistent with the findings of most previous scholars, it can be surmised that talent attraction strategies relate to work engagement of the non-teaching workforce.

The results also indicated that talent development strategies (performance appraisal, promotion and training) had a significant positive relationship with work engagement of non-teaching workforce. The finding corroborated those of previous scholars (Ajibola et al., 2019; Mugizi, et al., 2020b; Pandita & Ray, 2018). This is because these scholars reported the existence of a positive relationship between talent development and employee engagement. Relatedly, Aybas and Acar (2017) indicated that skill-enhancing human resource management practices positively and significantly related to employee engagement. Also, the studies by Bai and Liu (2018) and Liu et al. (2017) corroborated the finding of the study that talent development had a significant positive impact on work engagement. However, the finding of the study was contrary to those of the studies by Lee and Eissenstat (2018) and Morethe et al. (2020), who reported that talent development opportunities had no significant relationship with work engagement of employees. Nonetheless, with the finding of the study agreeing with

those of most previous scholars, it can be affirmed that talent development strategies have a largely significant positive relationship with work engagement of non-teaching workforce.

Nevertheless, the results revealed that talent retention strategies (organisational norms and values, quality incentives and retention policies) had a negative and insignificant relationship with work engagement of non-teaching workforce. This finding was close to the finding by Al Mehrzi and Singh (2016) that the talent retention strategy of incentives in terms of money had the least effect on employee engagement. However, the finding is contrary to the findings of most previous scholars (Hoole & Hotz, 2016; Victor & Hoole, 2017; Mugizi et al., 2020a). The scholars reported that the relationship between incentives and work engagement was positive and significant. Also, Brenyah and Obuobisa-Darko (2017) and Kang et al. (2020) revealed that organisational norms and values positively and significantly related to employee engagement. With the finding of the study being contrary to the finding of the study, it can be inferred that in the context of Kyambogo University, the talent retention strategies implemented hindered development of work engagement of the non-teaching workforce. This confirms the premise on which this study was based that in the universities, there was poor talent management (Namubiru et al., 2017). Therefore, talent retention strategies were poor.

Conclusion

The discussion above led to the conclusion that talent attraction strategies in terms of selective recruitment and selection are a game-changer for work engagement of employees. This is especially true in cases where the recruitment process involves scrutinising of resumes of the candidates, basing recruitment strictly on merit, assessing recommendations from referees, and carrying out reference checks. In addition, talent attraction is a game-changer for work engagement if the selection process is competitive and rigorous, relevant skills and job attitudes are evaluated, background checks are carried out on the candidates, and there are interviews with immediate supervisors and management. It was also concluded that talent development in the form of performance appraisal, training and promotion are a game-changer for work engagement of employees. This is when performance appraisal involves measuring performance based on objective results and training needs are identified through a formal appraisal mechanism. Also, talent development is a game-changer for work engagement when workers have the opportunity for fast promotion opportunities, the available promotion opportunities are satisfying, the promotion requirements are communicated and promotion is based on merit.

Concerning talent retention strategies, weak strategies hamper employee engagement. This is when there is a weak emphasis on norms, lack of a unique family atmosphere, limited open communication, with staff not being encouraged to speak up, and management does not value ideas and input from staff. Also, employee engagement will not be promoted when superiors are not accessible to staff, the spirit of teamwork is not promoted and the problems experienced by staff in their work are not understood. Work engagement also will not be promoted when there is a lack of quality incentives, with incentives not being comparable to the market and the pay being inadequate for staff basic needs. Further, work engagement will not change positively when retention policies are poor, with employees not given sufficient opportunity to use their talents and initiative, no effort is made by management to be pleasant to staff, and there are limited opportunities for staff to enhance their skills. In addition, retention policies will not promote work engagement when tasks are not assigned to the right people in a clear manner, the culture of participative decision-

making is not created, there are no flexible working arrangements and the workload does not allow a work-life balance.

Recommendation

Based on the conclusions above, it was recommended that managers of universities should implement talent attraction strategies that are game-changers for work engagement. The talent attraction strategies should include a recruitment process that involves scrutinising of resumes of the candidates, based strictly on merit, and involves assessing recommendations from referees and carrying out reference checks. Talent attraction strategies should also involve a selection process that is competitive and rigorous, there should be an evaluation of relevant skills and job attitudes, and the carrying out of background checks and interviews should involve immediate supervisors and management. Secondly, managers of universities should emphasise talent development to enhance work engagement of employees. This should be done by ensuring that performance appraisal involves measuring performance based on objective results and identifying training needs through a formal appraisal mechanism. University managers should also implement talent development strategies that include providing fast-satisfying promotion opportunities based on merit and the promotion requirements should be clearly communicated.

With weak existing talent strategies, university managers should strengthen talent retention at the university to promote work engagement of the non-teaching staff. The strategies should include a strong emphasis on norms, creating a unique family atmosphere, open communication, with staff being encouraged to speak up, and the imperative for managers to value ideas and input from staff. University managers should also be accessible to staff, promote teamwork and understand the problems experienced by staff in their work. Efforts should also be made to provide quality incentives that are comparable to the market so that staff can afford staff basic needs. Staff should also be given sufficient opportunity to use their personal talents and initiative, and managers should be pleasant to them and should also provide them with opportunities to enhance their skills. It should also be ensured that tasks are assigned to the right people in a clear manner, participative decision-making is created, flexible working arrangements are established and the workload allows a work-life balance.

Limitations

This study makes significant contributions in showing how talent management can enhance work engagement of workers. However, gaps that cannot be ignored emerged. For example, the results for the third hypothesis was to the effect that there is a significant relationship between talent retention strategies and work engagement of the non-teaching workforce contrary to what was conjectured. This is because while work engagement was high, the retention strategies provided were weak. Therefore, future studies should further test this relationship, possibly in more universities since this study was carried out in only one university. Further, the current study used the positivist approach, which limited in-depth analysis. Therefore, future studies should include the use of the interpretive approach for in-depth analysis.

Declaration

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Appendix: Study Instrument

Construct	Item	Measure
Section A: Demographics		
Demographics	BP1	Sex (1 = Male, 2= Female)
Profiles (BP)	BP2	Age group (1= Up to 30; 2 = 30 but below 40; 3 = 40 and above).
	BP3	Education level (1= Diploma; 2 = Bachelor Degrees; 4 = Masters)
	BP5	Years worked at the University (1= Less than 1 year; 1 but less than 5 years; 5 but less than 10 years; More than 10 years)
Section B: Work Engagement		
Absorption	ABS1	When occupied by my job tasks in this university, time flies without noticing
(ABS)	ABS2	When I am working on my job assignments in this university, all other things skip my mind
	ABS3	When intensely doing my job assignments in this university, I feel happy
	ABS4	In this university, I am totally focused on my work.
	ABS5	When I am working on my job activities in this university, I totally get lost into them
	ABS6	It is not easy to get separated from my work at this university.
Dedication (DED)	DED	The work I do in this university gives me a sense of meaning and purpose
	DED	I am zealous about my job in this university
	DED	The job I do in this university motivates me
	DED	I am pleased with the work I perform in this university
	DED	The work I do in this university challenges me
Vigour (VIG)	VIG1	I am always bursting with energy whenever I am doing my job
	VIG2	When I am on my tasks in this university, I feel energized and strong.
	VIG3	Each new day, I look forward to go to the university to do my assignments
	VIG4	When I am on the job I do in this university demands, I work for extended time
	VIG5	At my job in this university, I try to be mentally resilient
	VIG6	Even when things do not go well at work, I never give up
Section: Talent Attraction		
Selective	SR1	I tendered in a resume at the time of recruitment
Recruitment	SR2	My appointment on the job in this university was strictly based on merit
(SR)	SR3	When I was being recruited, I received enough pertinent information about this university
	SR4	When I applied for this job at this university, I received enough pertinent information about it
	SR5	I submitted recommendations from referees about my appropriateness for the job
	SR6	The university carried out reference checks on me
Selective	SS1	I underwent a competitive hiring process to get the job in this university
selection (SS)	SS2	I underwent a rigorous selection process to get hired by this university

Construct	Item	Measure
	SS3	When I was being interviewed to work at this university, my job-relevant talents were assessed
	SS4	When I was being interviewed to work at this university, my attitudes pertinent to the position were assessed
	SS5	I underwent background checks before I was appointed on my job position
	SS6	My immediate supervisor was on the panel that interviewed me
	SS7	I was subjected to an interview with management of the university
Section C: Talent Development		
Performance Appraisal (PA)	PA1	The performance evaluation I undergo is based on objective job results
	PA2	My university appraisal system is fair
	PA3	I get performance feedback after each evaluation
	PA4	My university's appraisal process helps progress of my career
	PA5	The appraisal process of the university takes place at regular intervals
Training (TR)	TR1	I am required to attend regular seminars and workshops in this university
	TR2	I receive opportunities for training in varied aspects of my job in this university
	TR3	To evoke my skills, I am assigned challenging jobs in this university
	TR4	Staff are encouraged to attain further studies in this university
	TR5	I have mentors that have been instrumental in way I perform my job
	TR6	The trainings I receive are as a result of the appraisal process of the university
	TR7	The university avails training opportunities consistent with my job changing needs
Promotion (PR)	PR1	I am sure that will get promoted to the next rank in this university
	PR2	I look forward to get promoted because of the associated benefits
	PR3	My promotion in this university will be fast
	PR4	I am aware of the promotion policy of this university because it has been communicated
	PR5	Merit is the basis for promotion in this university
	PR6	I know what I need to do to get promoted in this university
Section D: Talent Retention		
Quality Incentives (QI)	QI1	I receive compensation and benefits from this university that are competitive in the market
	QI2	I am happy with the benefits and compensation I get from this university
	QI3	In this University, rewards and remuneration are paid equitably
	QI4	I receive a fair pay for the work that I accomplish in this university
	QI5	My job performance has a significant impact on how much I get paid and rewarded in this university
	QI6	My incentives and compensation in this university are promptly paid.

Construct	Item	Measure
	QI7	The pay I receive affords me basic needs
	QI8	The amount of pay I receive in university is proportionate to my position
Norms and	NV1	Management of the university has created a unique family atmosphere
Values (NV)	NV2	The university emphasises open communication
	NV3	Management of the university encourages staff to speak up when they disagree with a decision
	NV4	Management of the university allows staff the freedom to express ideas
	NV5	Management of the university values ideas and inputs from staff
	NV6	Management of the university is open to questions from staff
	NV7	In this university staff have a chance to meet with superiors on one-to-one sessions to discuss performance and goals
	NV8	In this university there is a spirit of team work amongst staff
Retention Policies (RP)	RP1	The management of the university tries to understand the problems employees experience in their work
	RP2	On the job every employee is given sufficient opportunity to their personal talents and use initiative.
	RP3	Management makes effort to be nice to staff
	RP4	The university gives staff the opportunity to get to enhance their skills
	RP5	Tasks to staff are assigned to the right people in a clear manner
	RP6	A culture of participation in decision making has been created in this university
	RP7	Flexible working arrangements have been put in place for staff in this university
	RP8	The workload in this university allows work-life balance
	RP1	The management of the university tries to understand the problems employees experience in their work

PhD Studentship and Research Supervisors during the COVID-19 Pandemic at a Premier University in Uganda

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Abstract

Keeping in close touch with a research supervisor is often vital for any university student. Unfortunately, this is hardly possible during the period of a pandemic. In this study, we explored the supervisory challenges that the doctoral students and their research supervisors at a school in a premier university in Uganda experienced and the coping strategies they utilised during the COVID-19 pandemic. We were provoked to undertake the study due to the persistent undocumented complaints from graduate students about their inability to get in touch with their research supervisors because of the closure of the university that was brought about by the pandemic. Taking the interpretive approach, we used a phenomenological research design and collected data by interviewing PhD students and their research supervisors, whom we purposively selected. We analysed the data using the thematic content analysis technique that we based on the factors influencing doctoral research supervision, namely student factors, supervisor factors and institutional factors. Our study findings revealed key research supervisory challenges. At the students' level, we found loneliness, ICT challenges, unexpected study costs and family disturbances. While at the supervisor's level, we found inadequate supervisor support and ineffective communication. Yet at the institutional level, we noted unclear institutional research policies and ineffective communication. We therefore concluded that several supervisory challenges negatively affected the students' doctoral studies during the pandemic. However, there were varied but unclear strategies participants utilised to address these challenges. Hence, we recommend to university leaders to formulate clear institutional graduate training strategies for mitigating disruptions occasioned by any future pandemic.

Keywords: *PhD research supervision; COVID-19 pandemic; Research supervision challenges; Coping strategies; Premier university*

Introduction

Globally, it is believed that higher education (HE) is the engine of national development, specifically through doctoral research, which contributes significantly to knowledge and innovations (Costa, 2019). Indeed, several countries have embedded the issue of doctoral training in their national development plans. Locally, the Uganda Vision 2040, basing on the National Development Plans (1, 2 and 3), stresses the key role that higher education institutions (HEIs), mainly universities, should play in their societal transformation by producing research that generates new knowledge (Government of Uganda, 2013). Hence, doctoral research is a key contributor to this transformation. In fact, for doctoral students to successfully contribute to such transformation their research supervision is paramount (Masek & Alias, 2020). Helfer and Drew (2013) posit that where supervision is of poor quality, a student may have delayed completion and low-quality research outputs, and some may even withdraw their candidature. An effective and quality doctoral research supervision process is, therefore, called for to enhance high levels of doctoral students' successful completion. Unfortunately, the COVID-19 pandemic outbreak created a gap between doctoral students and their supervisors. Indeed, due to COVID-19, the way students were educated changed around the globe within a short span of time (Chung, Subramaniam & Dass, 2020). The education system worldwide witnessed the near-total closure of education institutions. Such closures halted teaching and research functions and the premier university was not exceptional and, undeniably, educational institutions switched over to remote learning (Daniel, 2020; Liguori & Winkler, 2020; Zraick & Garcia, 2020). In an attempt to adhere to the standard operating procedures (SOPs), doctoral supervisors and their supervisees could hardly physically meet. Notwithstanding the usage of ICT, in most universities, its use in the research supervision process was (and is) still limited due to the challenges of connectivity and internet failure, among others (Onyema et al., 2020; Ujang, 2021; UNESCO, 2020; World Bank, 2020). Such online learning and supervision left a void in the doctoral student and supervisor relationships, probably creating varied intricacies in the doctoral research supervisory process. So, we wondered how doctoral students and their supervisors in the premier university were sailing through that period of lockdown with their research, thus the genesis of our study.

Based on the models of the "Supervision Triangle" by Almusaed and Almssad (2020) and "Students Supervision" by Masek and Alias (2020), in our study, we came up with a conceptual framework comprising three factors that influence doctoral research supervision, namely: 1) student factors; 2) supervisor factors; and 3) institutional factors. Regarding student factors, we focused on the student's personal characteristics. For supervisor factors, our focus was on supervisor qualities. Finally, for institutional factors, we concentrated on doctoral research policies or regulations (at school and university levels – infrastructure, resources, and research environment). We, therefore, examined the challenges in doctoral research supervision in a school at a premier university in Uganda during the COVID-19 pandemic focusing on the student, supervisor, and institutional levels.

Conceptually, we focused on three key concepts, namely doctoral research supervision, the COVID-19 pandemic, and challenges. First, doctoral research supervision is made of two terms (i.e. doctoral research and supervision). Doctoral research (or PhD research) is that research which generates new knowledge and transforms the student into a professional researcher and strengthens institutional research capacity (Kemoli & Ogara, 2015). While supervision is a focused interaction or relationship between the supervisor and the student to achieve intended objectives (Zaheer & Munir, 2020). Research supervision, according to Lee (2008), is a facilitative process that involves providing educational tasks such as mentoring, coaching, and supporting a student to participate and

develop academically. This facilitative process is performed by a supervisor through the provision of intellectual expertise and counseling. Based on Lee's definition, in this study, we looked at doctoral research supervision as a facilitative process where doctoral students are mentored, coached and supported to develop into researchers who can generate knowledge that contributes to institutional research capacity and to the scholarly community. Second, COVID-19 is an infectious disease caused by a coronavirus known as the severe acute respiratory syndrome coronavirus-2 that was identified in Wuhan City, China in December 2019 (WHO, 2020). However, for our study, we focused on the COVID-19 pandemic era, referring to the period universities in Uganda were locked down (in 2020 and 2021) due to COVID-19 and other alternative means of learning at a distance, such as online (virtual) learning, were adopted to minimise the rate of infection. Third, by challenges, we mean complexities in doctoral research supervision. We assumed that students are faced with a diversity of intricacies in their doctoral journey; thus, we focused mainly on the challenges doctoral students faced in the research supervision process during the lockdown period due to the COVID-19 pandemic in Uganda in 2020 and 2021.

Contextually, we conducted this study in a school at a premier university in Uganda. Our choice of university was premised on two main factors. First, in our preliminary studies, we discovered undocumented but persistent complaints from a section of doctoral supervisors together with their supervisees at the school about the effectiveness of conducting the research process in the new normal caused by the COVID-19 pandemic. This made us wonder what could cause them not to effectively conduct the research function during this era of technology. Second, it was easier for us to gain access to and gather data during the study.

Problem statement

Ideally, doctoral research involves interactions between a supervisor and supervisee during which each contributes towards the completion of a research project for a PhD award. Unfortunately, the COVID-19 pandemic and the resultant lockdowns that led to the closure of all educational institutions in 2020 and 2021 could not allow such physical or virtual interactions to occur easily. Indeed, the pandemic affected almost all academic units, including academic activities due to the lockdown. Our preliminary investigation at the premier university indicated that the research supervision process was one of the activities most affected by the COVID-19 pandemic. Much as the scenario was undocumented, it made us worried about the students' successful completion of their PhD studies. If the supervisory interaction is hindered by the COVID-19 pandemic and the related SOPs, then the students' successful completion of their studies would be affected. This would result in wastage of resources in terms of funds, time and eventual stress, thus negatively affecting the university and knowledge production and dissemination. Therefore, we explored the challenges of doctoral research supervision during the COVID-19 pandemic era (2020-2021) at the premier university in order to come up with the appropriate coping strategies that could help students successfully complete their PhD studies.

Purpose of the study

We generally explored the challenges of doctoral research supervision and the coping strategies adopted by students and supervisors to successfully complete their PhDs in a school at a premier university in Uganda during the COVID-19 pandemic.

Objectives of the study

We specifically:

1. Examined the challenges of PhD research supervision at the student's level in a school at a premier university in the era of the COVID-19 pandemic.
2. Examined the challenges of doctoral research supervision at the supervisor's level in a school at a premier university in the era of the COVID-19 pandemic
3. Examined the challenges of doctoral research supervision at the institutional level in a school at a premier university in the era of the COVID-19 pandemic
4. Analysed the coping strategies for the challenges of doctoral research supervision in a school at a premier university in the era of the COVID-19 pandemic.

Review of related literature

Scholars (e.g. Dhawan, 2020; Rapanta, Botturi, Goodyear, Guàrdia, & Koole, 2020), who investigated the intricacies of research supervision during the COVID-19 pandemic generally reported the challenge of a drastic shift from conventional face-to-face to online learning and remote university study courses via Zoom, Microsoft Teams, and Skype, among others. Their reports implied a change in content delivery, the tools or technology used, and a change in the learning environments, all of which challenged the teaching-learning process, not even sparing doctoral research supervision. However, in our study, we reviewed literature under three objectives focusing on three levels, namely students, supervisors, and institutional challenges in doctoral research supervision during the COVID-19 pandemic. We also reviewed the literature on coping strategies for the challenges in the doctoral research supervision process.

Students' challenges

The COVID-19 pandemic has posed several challenges to the progress of graduate students' research. In this regard, Kemoli and Ogara (2015) argue that in the normal face-to-face approach to student learning, the students are encouraged by their supervisors to attend research workshops and they are also guided to use computer programmes to facilitate their doctoral studies. However, during the lockdown and the related SOPs, it was reported that the interaction between students and their supervisors was hampered. Scholars (e.g. Dhawan, 2020; Zaheer & Munir, 2020) report that when students lack face-to-face interaction with their supervisors and resort to online learning, the interaction between them (student and supervisor) is hampered, and consequently students lose the personal touch. Equally, Zaheer and Munir (2020) report that student-supervisor interactions are hindered because some online applications do not have free access. Yet, according to Kumar, Kumar and Taylor (2020), embarking on a supervisory relationship in a virtual environment requires building trust and having personal connections, which are difficult in the absence of physical interactions. Kumar et al. (2020) add that lack of physical interactions renders students ignorant of the current academic trends and their academic writing ability is negatively affected.

Pyhalto, Vekkaila and Keskinen (2012) attest that face-to-face teaching-learning provides an opportunity for regular supervision and active student involvement. In fact, Pyhalto et al. claim that doctoral student involvement in their research project(s) is vital to the successful completion of their studies. Such involvement helps them to learn and endure problems they may encounter during their respective doctoral journeys. However, other scholars (e.g. Kumar et al., 2020; Pyhalto et al., 2012; Zaheer & Munir, 2020) stress that those students who have online lessons are not actively involved because they are lonely and are often distracted by their families. Indeed, Kumar et al. (2020) affirm

that such students have feelings of being isolated and they are often hesitant to initiate contact with their supervisor; thus, they lack a sense of connection with the supervisor when working on their research at a distance. They also lack peer support and a scholarly environment for collaboration to enhance their writing skills; hence, they cannot write regularly, causing dissatisfaction even on the part of their supervisors.

Askew, Dixon, McCormick, Callaghan, Ying Wang and Shulruf (2016) argue that students' skills and ability to handle their doctoral work are important to the supervisor, as this reduces the latter's heavy workload. However, other scholars (e.g. Dhawan, 2020; Kumar et al., 2020; Pyhalto et al., 2012; Zaheer & Munir, 2020) report that some students do not have the abilities and confidence to learn online, which leads to dissatisfaction and confusion. Besides, they report that students' characteristics (e.g. inadequate motivation, self-regulative skills, persistence, etc.) hamper their own study during distance learning. Zaheer and Munir (2020) particularly report that some students have low self-efficacy and during distance learning, many rarely write or publish research papers. Besides, Kumar et al. (2020) report that some students do not know how to effectively manage and communicate online. Additionally, Kumar et al. claim that even if supervisors go ahead to give feedback, it is difficult for students to understand the written feedback without (supervisors') clarification.

Similarly, other researchers (e.g. Dhawan, 2020; Irene, Bal1, Kiran, Zixin, & Kae, 2020; Nash, 2021; Pyhalto et al., 2012) reveal that students express problems related to balancing doctoral studies, personal lives, and other professional duties when studying at a distance, which creates a lot of stress among them. In fact, Nash (2021) emphasises that graduate students are reluctant to direct their learning themselves because they suffer from anxiety and depression resulting from stress due to the COVID-19 pandemic. Likewise, Dhawan (2020) reports that students' learning efficacy due to the COVID-19 pandemic is depicted in their behaviours in terms of distractions, frustration, anxiety and confusion. Several scholars (e.g. Dhawan, 2020; Kumar et al., 2020; Zaheer & Munir, 2020) report that e-learning has certain challenges that pose technical difficulties for students, hence slowing down the teaching-learning process. These challenges include internet accessibility and speed and irregular power supply, coupled with students' capabilities to use information technology (IT). The challenges sometimes do not allow students to use IT effectively. Besides, Kumar et al. (2020) clarify that IT has a challenge of time and location flexibility. Once lessons have been programmed, it is not possible to readjust in case a student encounters difficulty and misses out on learning.

Supervisors' challenges

Regarding complexities relating to supervisors, Askew et al. (2016) assert that supervisory relationships chiefly contribute to the success of the PhD journey. The quality and frequency of student-faculty interaction, especially the supervisory relationship, is identified as the central regulator of PhD student engagement. However, other scholars (e.g. Zaheer & Munir, 2020) report that distance supervision in virtual communities pose a challenge to the occurrence of effective academic collaborations. Specifically, Askew et al. (2016) report a destructive atmosphere that includes competition, conflicts and inadequate supervision, among others. Further, Askew et al. stress that there is no constructive supervisory relationship where supervisors give support and feedback to their supervisees. They also report that interaction with other researchers and supervisors, as well as a supportive atmosphere in one's own research community also has limitations. They emphasise that the distance learning approach where student-teacher interaction lacks face-to-face interaction and involves the physical absence of the supervisors hinders relationship-building. The virtual

approach increases the responsibility of the supervisors in building an interactive system where students feel confident and supported during their research work.

Similarly, Zaheer and Munir (2020) report that PhD research challenges students not only when it involves the conventional approach but is even more challenging when it is done online. Equally, Kemoli and Ogara (2015) argue that a supervisor plays a key role in the supervision process (e.g. mentoring and counselling of the student), which is essential for good PhD research. However, Rapanta et al. (2020) claim that during the COVID-19 emergency situation, teachers are suddenly tasked to change over to online teaching using tools that the majority are not so familiar with. In this regard, Dhawan (2020) observes a challenge for teachers to adapt to online approaches in terms of content to be covered, methodologies, and time for engaging students. Askew et al. (2016) also state that supervisors are overwhelmed with heavy and inequitable workloads due to diverse student needs. Askew et al. further note that the workload is unevenly distributed since it does not take into account the number of students per supervisor.

Dhawan (2020) claims that, just like students, not all teachers have access to all digital devices and the internet, and that the cost of buying those gadgets makes some fail to get in touch with their students. Further, Askew et al. (2016) report that supervisors are challenged by internet accessibility, and some supervisors, according to Nash's (2021) observation, do not have the ability to use digital devices, which further limits their capacity to communicate with their supervisees.

Askew et al. (2016) report that research supervisors are constrained by time. Supervisors argue that some students either live in remote areas or have their own issues, which makes their research journey very difficult. According to Askew et al., supervisors and students clash over time as they have different programmes which do not allow effective research discussion, hence delaying the students' research progress. Askew et al. (2016) reveal irregular contact between supervisors and their students. They clarify that students involved in distance learning do not often show up in class as they normally do under the conventional approach, which makes them complacent, inactive, and lose contact with their supervisors. Such irregular contact results in dissatisfaction on the part of supervisors to the extent that they (supervisors) forget what they had suggested; thus, a need to start from scratch.

Other researchers (e.g. Askew et al., 2016; Zaheer & Munir, 2020) reveal that students engaged in distance learning are diverse with varied expectations regarding their work and supervisors, which is sometimes problematic. They argue that though diversity is good, it is overwhelming and requires different levels of mentoring on the part of supervisors. Some students expect supervisors to do their work and need frequent supervision, which is impossible, as compared to others who are self-directed and, as such, need less supervision. Further, Askew et al. (2016) reveal that distance teaching poses challenges to instructors since some of their students have no access to the resources, which increases the chances of deception by the students in their work. They argue that being at a distance is sometimes tricky for a teacher to establish the authenticity of the work submitted by the students to determine whether it was truly done by them.

Institutional challenges

Kumar et al. (2020) note that supervisory meetings (e.g. doctoral committee meetings) help teachers to discuss drafts of their students' dissertations. Such meetings help students to do academic work that they cannot do independently. The interaction with their supervisors and knowledgeable peers slowly trains them and develops their research and writing skills. Student preparation in research

methodology studies is only one component of the full, complementary set of technical and critical abilities that are demanded. Such preparation requires students to be directed to university facilities and be offered online support.

Askew et al. (2016) report that the main prerequisites for doctoral training emphasised by supervisors and supervisees are structures and resources such as access to proper research facilities and finances. Dhawan (2020) reports challenges related to designing and developing e-technologies (i.e. e-learning programmes, e-resources and e-content delivery). These technologies require a lot of time and funds, regular maintenance, training of human resources and development of online content.

The preceding literature we reviewed related to the challenges of doctoral research supervision revealed several gaps left by other researchers. For example, scholars (e.g. Dhawan, 2020; Nash, 2020) relied on secondary data to come up with their report with no empirical validation. Askew et al. (2016) only focused on supervisors as a factor, leaving out other factors which impact on doctoral research supervision. Other researchers (e.g. Rapanta et al. (2020) never pointed out gaps that their studies were filling to clearly understand their contribution to the body of knowledge. Several authors never based their research on theoretical frameworks and most of their studies lacked strong theoretical rigour. We thus attempted to fill these gaps by exploring multidimensional levels (students, supervisors and institution) of intricacies in the PhD research supervision process.

Coping strategies

Besides studying the complexities of PhD research supervision, some scholars examined the coping mechanisms for these complexities to capture an understanding of how to successfully complete the doctoral journey during the pandemic. Indeed, Borgeson, Sotak, Kraft, Bagunu, Biorserud and Lange (2021) studied the challenges in PhD education due to COVID-19 using a cross-sectional survey of Swedish biomedical sciences graduates. They collected data through the use of questionnaires from biomedical administrators and medical PhD students at eight major universities in Sweden. Their findings indicate that it is important to have more frequent supervision and a diverse array of meeting platforms to provide the best possible supervision for PhD students during the pandemic. Besides, it is important for the students to feel that they have their supervisor's emotional support. In fact, Gray and Costa (2020) instead suggest the need to employ several ways of communicating, specifically increasing the use of online platforms to enhance students' research. Besides, Hossain, Ying and Saha (2020) report that the pandemic resulted in a reduced frequency of physical in-person meetings and an increase in virtual supervision via alternative platforms (e.g. email or telephone).

Similarly, Kumar et al. (2020) report public conferences as a coping strategy that gives access to IT support for students in their guide to online supervision for graduate education in the UK. They show how the library personnel and distance education support staff provide a virtual campus environment for distance education students. Based on that environment, they report that institutions had developed online discussions to provide information and support for postgraduate research students.

Nash (2021) investigated mentorship and supervision undertaken during COVID-19 to reduce graduate student anxiety and depression based on the work of the health narratives research group in the Faculty of Medicine, University of Toronto. He reveals that there were measures in place to put more resources at the disposal of graduate students to address the challenge of students faced with anxiety and depression. However, Nash reports that even with more resources made available, mental health issues had been rising at an alarming rate.

It is worth noting that most literature related to the complexities of doctoral research supervision during COVID-19 rarely highlights the strategies available to aid effective PhD supervision! Thus, the need to examine key coping mechanisms for PhD students' research supervision process aimed at their successful completion of their studies. Other authors, such as Borgeson et al. (2021), reveal that strategies have limitations; thus, their findings cannot be generalised because the doctoral programmes in Sweden may differ from those in other countries. In fact, the Swedish PhD studies are free of charge, and students are entitled to generous parental leave and childcare facilities, rendering students less vulnerable compared to students in other countries. Sweden also had very few COVID-19 lockdown regulations and restrictions, which is unique worldwide, and set it from even other Scandinavian countries.

Methodology

We employed an interpretative approach and used the phenomenological research design because we aimed to understand the participants' perceptions and lived experiences of the challenges of the PhD research supervisory process and the coping strategies in a school at a premier university in Uganda. We selected nine study participants using purposive sampling and we collected data from them using mobile android phone audio-recorded interviews. The participants included PhD supervisors and their students who were either at their proposal or report writing stages. Among the supervisors, we interviewed two male lead-research supervisors since the school lacked females. The students at the proposal level were four (two male and two female). The rest (two male and one female) whom we obtained from a male-dominated population were writing their final reports. For ethical purposes, we kept the participants and the university anonymous and assigned each a pseudonym, thus Isaac and Stephen for supervisors; Bosco, Diana, Lukia and Tom for students at the proposal level; and Emma, Fred and Sarah for those at the report writing stage; and premier for the university. After data collection, we transcribed, coded and analysed the data with the use of the thematic content analysis technique. We then reported the study findings by use of a narrative style of thick descriptions.

Study Findings and Discussion

Profile of the study participants

We grouped the PhD student study participants into two groups based on their sex (female and male) and stage of research (proposal and report writing stage), with the expectation that they might perceive the challenges of the supervisory process due to the pandemic differently. However, the responses, irrespective of the respondents' sex as well as the stage of research they were at, were similar. This finding agrees with that of Borgeson et al. (2021), who reported similarities in perceptions between the groups of educational stages of PhD students regarding the pandemic-related restrictions.

Empirical findings

Several study participants reported numerous supervisory challenges they faced during the COVID-19 pandemic. We categorised the key challenges according to the study objectives, namely challenges at 1) student, 2) supervisor and 3) institutional levels. The details of the findings are provided below:

Challenges at student level

A critical analysis of the challenges at this level revealed four core themes, namely: (i) loneliness; (ii) ICT challenges; (iii) unexpected study costs; and (iv) family disturbances.

Loneliness. Some participants reported loneliness as their challenge. For instance, Diana, a student at proposal writing stage reported, "…I could not do all by myself. The pandemic and the SOPs cut down the physical sharing with my PhD peers... I needed especially academic support…. I lost my academic writing skills that I had acquired..." Bosco, Diana's counterpart, similarly reported, "The lockdown disrupted my academic environment. I worked alone and no one could guide me..." Besides, Sarah at report writing stage, reported, "…I experienced loneliness even when I tried to endure …" Isaac, one of the supervisors stated, "I could no longer meet my students. They were on their own and we were each struggling for life…" These responses meant that the PhD students, irrespective of their stage of research, desired to physically interact with their peers and supervisors to iron out their individual academic challenges during the pandemic. This finding agrees with the observations of Kumar et al. (2020), who reported that students were isolated and lacked a sense of connection with the supervisor when they worked on their research at a distance. Kumar et al. reiterated that students who are thus isolated lack peer support and a scholarly environment for collaboration to enhance their writing skills. However, this finding contradicts those of Ujang (2021), who reports that learners and lecturers communicated via the internet regularly even under the threat of the COVID-19 pandemic. The situation at the premier university could be that internet costs in Uganda still remain high. During COVID-19 staff and students were preoccupied with eking out a living since they were not working due to the lockdown in addition to the poor connectivity, other factors notwithstanding.

Information and Communications Technology (ICT). Several participants identified the challenges related to the use of ICT. For instance, Bosco reported that he had a challenge of accessing some documents unless he was at the university. Fred, who was at the report writing stage, particularly pointed out, "... I am not so conversant with modern technology such as Zoom…. I experience poor internet connectivity…" Similarly, Tom, at the proposal writing stage, reported that "…unlike at the university, internet connectivity was very poor and power supply was irregular…" Isaac reported that "ICT challenges such as internet connectivity locally affect every person whether student or us supervisors." Another supervisor (Stephen) reported, "…I had my lockdown at my country home where there was no electricity and my solar energy could not provide power needed for charging my gadgets for internet… I ended up getting lost altogether during the lockdown… how about students?" These responses meant that supervisees did not only have inadequate knowledge of the use of ICT but also experienced unreliable internet connectivity and power disturbances while doing their work. These findings concur with those of earlier scholars (e.g. Dhawan, 2020; Kumar et al., 2020; Zaheer & Munir, 2020), who report that e-learning posed technical difficulties such as internet accessibility and speed and irregular power supply, coupled with students' capabilities to use information technology.

Unexpected research costs. Several participants concurred that their studies became unpredictably costly during the lockdown. For instance, Tom reported that "…the study became costly in terms of data, transport, printing and meeting with doctoral peers…" Relatedly, Emma, at report writing stage, reported that "…there was no transport to reach my study respondents. When they released [lifted] the lockdown, transport fares were increased, making data collection costly." Similarly, Sarah narrated, "I was challenged financially... I could not afford data and other financial requirements

[transport, stationary, photocopying and printing] …" These responses depicted that the unexpected study costs were a hindrance to students' research progress since most of them were not working yet they were self-sponsored. This finding almost tallies with that of Dhawan (2020), who reports challenges related to the costs of devices and equipment in the use of e-learning programmes.

Family interruptions. An average number of participants, especially married students irrespective of their sex, reported the challenge of family troubles. Precisely, Sarah stated, "… I am married and I have a family... Motherhood and parenting issues alongside my PhD research were difficult. During the lockdown, I had to study from my home. I changed schedules to read at night because my young children could not make me settle for my studies at home.... While at home I had to share my laptop, mobile phone and reading space with my children because at the same time they were also studying online [via Zoom]. Everything was messed up…" Besides, Tom observed that "… being a family man [father and husband], my children were also locked down and they were studying online…. We competed for computer, mobile handset and data, among others." Likewise, Bosco revealed, "… I had distractors at home. I could not dedicate time to serious academic work." One supervisor (Stephen) stated, "I deal with mature students with so many family disruptions, who are always on and off even in the normal face-to-face meetings. They were disturbed a lot when they remained at home. Equally, I turned the lockdown into an opportunity to freely interact with my family members as a new normal…" Impliedly, these responses indicate the difficulties students with families faced in scheduling time for their research work. For students and their supervisors alike, staying at home led to other family concerns, such as caring for family members and stress, among others. Besides, the responses meant that the students possibly desired to study in a decluttered, plain and professional environment, yet their respective homes lacked such an environment. These findings concur with those of other scholars (e.g. Dhawan, 2020; Nash, 2021; Pyhalto et al. (2012), who reveal that students expressed problems related to balancing doctoral studies and personal lives when studying at a distance, which created a lot of stress among them. Particularly Dhawan (2020) reports that students' learning due to the COVID-19 pandemic was depicted in students' behaviour in terms of distractions, frustration, anxiety and confusion. Borgeson et al. (2021), too, highlight the specific challenge of childcare attested by several students with home-caretaking responsibilities during the pandemic.

Challenges at supervisors' level

At the supervisors' level, the study participants focused mainly on inadequate supervisors' support and their ineffective communication as the key challenges.

Inadequate supervisors' support. In this regard, Tom observed that "…my interaction with the supervisors had gaps …. Even when we met physically, we could not take a long time. Inability to meet my supervisor physically almost killed (sic) my academic writing skills that were growing and lengthened the journey [research process] ..." Besides, Bosco reported that "... my second supervisor was over-expectant, at times asking for too much. So, I could write and respond hurriedly; as such he remained unsatisfied." Likewise, Lukia at proposal writing stage, stated that

> ...my supervisor dragged me and I could not push him. There was no physical presence [in-person meetings] to check on [make arrangements to meet] him. Online supervision made it difficult for my supervisor to explain to me some concepts to understand better... At the beginning of the lockdown [March 2020], he [supervisor] became so busy and was not interested in my research. So, I became stuck…

Similarly, Sarah observed that "…my supervisors used the pandemic to do their other businesses at the expense of supervising us [the PhD students]. When they tried to send short messages [SMS], they did it too late and we missed lots of things such as public defence. This made us worried..." Isaac reported that "supervisory challenges are so real. Where do you expected me to meet my students during the lockdown? That means my students have to struggle on their own." These voices meant that the supervisees experienced unmet support needs (advice, guidance, and care) from the supervisors during the lockdown that negatively impacted their studies. Indeed, there was a general perception among this category of participants that the pandemic brought to light issues at the supervisors' level that might otherwise have gone unnoticed at the school we studied. These findings are in line with the claims of other authors (e.g. Zaheer & Munir, 2020), who reported that distance supervision challenges effective collaboration between students and hinders relationship-building. However, the finding disagrees with the claims of Borgeson et al. (2021), who reported that many students received support from their mentors during the pandemic, with ample opportunities to connect through online meetings, text messages or email. We attribute the disagreement between the other authors to the fact that their studies were conducted in a totally different economic context.

Ineffective communication. Several participants reported gaps created by their supervisors during their communication in the lockdown. For instance, Fred said, "…My supervisors on many occasions failed to respond to my calls...." Besides, Emma reported, "I had no in-person communication with my supervisors to boost my research abilities..." Similarly, Bosco reported, "I tried to send soft copies of my work to my supervisors but they never even opened… To make matters worse, they never even responded to the short messages [SMS] I resorted to." Equally, Lukia intimated that "...my supervisor could not respond to my call. … I could send work but remained quiet, which affected my progress." The two supervisors hinted on limitations to discussions with their students on mobile handsets during the lockdown. For example, Stephen said, "Even if you are to allow calls from students, for how long will you talk over the phone? What happens is that, once in a while you send text messages but they are inadequate." These voices depict the supervisors' failure to give feedback to their respective students, which left them in a dilemma. This finding tallies with Askew et al.'s (2016) assertion that due to time constraints, research supervisors have irregular contacts with their students which do not allow effective research discussion, hence delaying the students' research progress.

Challenges at institutional level

At institutional level, the participants reported unclear institution research policies and poor communication as challenges.

Unclear research policy of the institution. In this regard, Tom reported that "…the sudden closure of the university presumably caused more problems of uncoordinated implementation of the supervisory policy in the new normal. The school had not embraced the new normal [using Zoom for defences] but rather still believed in the former in-person contact to handle doctoral meetings". Bosco, too, reported that "...originally, I was certain of leaving home for the university for academic needs. However, during the lockdown our school neither opened nor provided opportunities for the scholarly environment..." Similarly, Lukia reported that "...defences [viva] were cut off …" Fred, too, reported that ".... The school failed to come up with a standard mode of supervision during the crisis..." The supervisors concurred on the issue of unclear research policy. In particular, Isaac lamented: "The pandemic was in fact an uncommon scenario that was not thought about by the

university itself that left, caught us unaware. Therefore, everyone did things as he or she desired…" These responses meant that due to sudden closure of the university, the research process that had worked before the pandemic could not work in the resultant crisis (i.e. new normal) that prevailed due to the SOPs. These findings agree with Kumar et al.'s (2020) observation that the absence of supervisory meetings (e.g. doctoral committee meetings) deprives teachers of the opportunity to discuss their students' research work and to train them to develop their research and writing skills. Similarly, Askew et al. (2016) report that the main prerequisites for doctoral training supervisors and supervisees emphasise are structures and resources such as access to proper research facilities and finances.

Poor communication. A few participants reported the challenge of poor communication within the school. For instance, Sarah observed: "…I needed more guidance from the school on different research-related issues. Our school administrators never talked to students to give them hope and courage; instead the school abandoned us [students]". Additionally, Sarah narrated that "…school administrative secretary was not ever regular in office and ever complaining about a busy situation and made herself a 'small god' in the office. Even when the president released [lifted] the lockdown, offices remained closed. They could not respond to calls from students." Similarly, Lukia reported, "The school has no clear way of addressing challenges we [students] face. In case I have an issue, I have to address it directly to the Dean of the school. We do not have functional committees to task supervisors to report their supervisees' progress. Even the policies in place do not befit the pandemic era." Likewise, Fred reported that, "We [students] experience a challenge of communication shutdown that keep us in a blackout.... When students call for inquiries, the secretaries do not pick. We expected communication from the school regarding conferences but in vain…" Isaac, a supervisor, noted that "…at our school, it is to whom it may concern. We hardly know what is taking place." These responses imply that quality and frequency of communication from the school to students were compromised during the pandemic possibly because of instant double closure of the university in March 2020 and June 2021, yet changing over to online communication (new normal) was seemingly difficult. This finding is almost similar to that in Dhawan's (2020) report that challenges related to designing and developing e-technologies are costly in terms of time and funds – that they require regular maintenance, training of human resources and development of online content.

Coping strategies

The study participants reported varying strategies to cope with the PhD research supervisory challenges during the COVID-19 pandemic that they identified. However, all the participants were either silent on or seemed to lack consistency in applying the strategies at institutional level. The key strategies included the following:

Accepting to study in isolation and rescheduling time for studies. Though this strategy featured most, it appeared to be a consolation to the students and it never helped them to progress as well as they expected. As they attempted to press to complete their studies, the students occupied themselves academically during the lockdown. Most of their voices indicated that there was no clear and consistent way they could work on their research projects. Lukia, for instance, reported, "...I settled and read widely alone…" Similarly, Bosco disclosed, "I worked alone…. I decided to go to the office since there were no interruptions. At home, I worked at night..." While Fred revealed, "I looked for data bundles and also found a place where I could write on my own since there was no initiative from our school. I worked harder to find loopholes in my work and sought assistance

from other colleagues [peers] and supervisors [academics] outside our school…" The supervisor Isaac, in particular, said that "…there was no way out, students and us supervisors had to continue struggling until when the situation went back to normal." These responses indicated two key issues, namely: 1) the students were committed and took the initiative to overcome their individual PhD research challenges with neither their supervisors' nor their school's input, and 2) the PhD supervisors abandoned their supervisees and the school administration never made any follow-up. These findings contradict Borgeson et al.'s (2021) results that supervisors provided support to their PhD supervisees and arranged opportunities to work from home and/or in a safer environment. Indeed, they established an online calendar to avoid crowds and encouraged Zoom meetings. We are, therefore, free to state that at the school that we studied, the absence of such a coping mechanism constituted a nightmare during the period of the lockdown.

Use of several ways of communication, including emails and online peer study groups. In this regard, Bosco intimated, "…I kept checking my emails to find out whether my work had been sent to the supervisor. I also kept consulting the supervisor by emailing and texting till they responded." Similarly, Lukia reported:

> …We started peer mentorship in our cohort using WhatsApp and Zoom for discussions.... Each of us [students] could present work [proposal drafts] to be critiqued by peers. We ended up improving the quality of our work… However, we were limited by the failure of the peers to identify weaknesses that needed specific improvement...We also enrolled in the university PhD forum that had online research discussions.... We got links from other universities that kept us alive [active] by forwarding relevant research resources.

These responses imply that the students changed over to a 'new normal' – online peer doctoral meetings – to equip themselves with research skills. Indeed, the pandemic seemed to have changed the format of communication and the mode of supervision from in-person to online mode. These findings align with those of Kumar et al. (2020), who report online conferences and discussions as coping strategies which provide information and support for postgraduate research students. The findings also agree with Hossain, Ying and Saha's (2020) observation that the pandemic led to changes in the format of the supervision process, as meetings moved primarily online with an increase in virtual supervision via alternative platforms (e.g. email or telephone) and with the suggestions of Gray and Costa (2020), who identified the need to increase the use of online platforms. Regarding strategies, the supervisors remained silent. Their silent voice indeed meant that they were of little help to students with regard to communication coping strategies and seemingly neither the school nor the university rendered such help in the students' research supervisory endeavours. However, our study finding indicates that students experienced virtual meetings only with their peers (fellow PhD students) and none with their supervisors, or any organised by their school! Equally, the peer online meetings had limitations. Thus, there is a need for the premier university to come up with clear strategies to handle PhD supervisory issues during the pandemic, particularly during the lockdown.

Conclusion and Recommendations

As the COVID-19 pandemic swept through a school at a primer university, it created an unprecedented crisis with momentous challenges which included the following: (1) The doctoral students experienced loneliness, poor internet connectivity, unexpected costs and family interruptions. (2) The supervisors inadequately supported their students and ineffectively communicated with them. (3) The institution had communication gaps and its research policy did not befit the research

supervisory process during the pandemic. (4) Individualised coping strategies for the challenges that could not be institutionalised. We, therefore, recommend that the school, in particular, and the premier university, in general, should: (1) Ensure digital equity where every student has access to the required online application resources they desire to use, train them in ICT use, and schedule time when they can meet with their peers and supervisors to avoid loneliness. (2) Urgently conduct refresher supervisory training to ensure that all supervisors are conversant with the new and emerging practices, such as providing online support infrastructure as well as an enhanced supportive and caring role regarding students' wellbeing during any crisis. (3) Employ alternative ways of communicating, but specifically increase the utilisation of a more robust and frequently accessible multitude of online (ICT) tools and platforms (email/messages and telephone). (4) Come up with contingency plans which are institutionalised on how to conduct online research supervision to prepare for other similar emergencies which may disrupt academic progress in future.

Suggested Areas for Further Research

First, we explored the challenges of PhD research supervision in one school and in a premier university. Thus, other voices of graduate students from this school and voices from the rest of the schools within this university and other universities need to be explored. Second, being a qualitative study, the findings cannot be generalised. Therefore, we suggest that there is a need for further studies to enhance generalisability. Third, we conducted this study in a university in a less developed country where ICT use is not much rooted in the research process; thus, our findings may be limited to similar contexts.

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Using the European Customer Satisfaction Index (ECSI) Model to Examine Student Satisfaction in the Context of Universities in Uganda

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Abstract

Student satisfaction (SS) is one of the strategic tools for a university in a competitive environment. Hence the need to investigate SS in universities. The aim of our study was to use the European Customer Satisfaction Index (ECSI) model to examine SS in universities in Uganda. The ECSI model suggests that SS is dependent on university image (UI), student expectations (SE), service quality of infrastructure and tangible service elements (SQITSE), service quality of people and processes (SQPP) and perceived value of investment (PVI). The ECSI model further suggests that PVI is dependent on UI, SE, SQITSE and SQPP. It also suggests that student loyalty (SL) is dependent on UI, SS and SQPP and finally that SE is dependent on UI. We designed a self-administered questionnaire on those constructs and had a sample of 704 students from seven universities in Uganda respond to it. We analysed our data using linear regression. Our findings gave support to the ECSI model in examining SS. We established that all the relationships among the constructs in the ECSI model were significant except the relationship between SQITSE and SS. We concluded that the ECSI model was appropriate for examining SS in the context of universities in Uganda. We recommend that university authorities allocate resources to improving their respective UI, SE, SQPP and PVI so as to enhance SS which invariably leads to SL.

Keywords: *ECSI; Linear regression; Student satisfaction; Uganda; Universities*

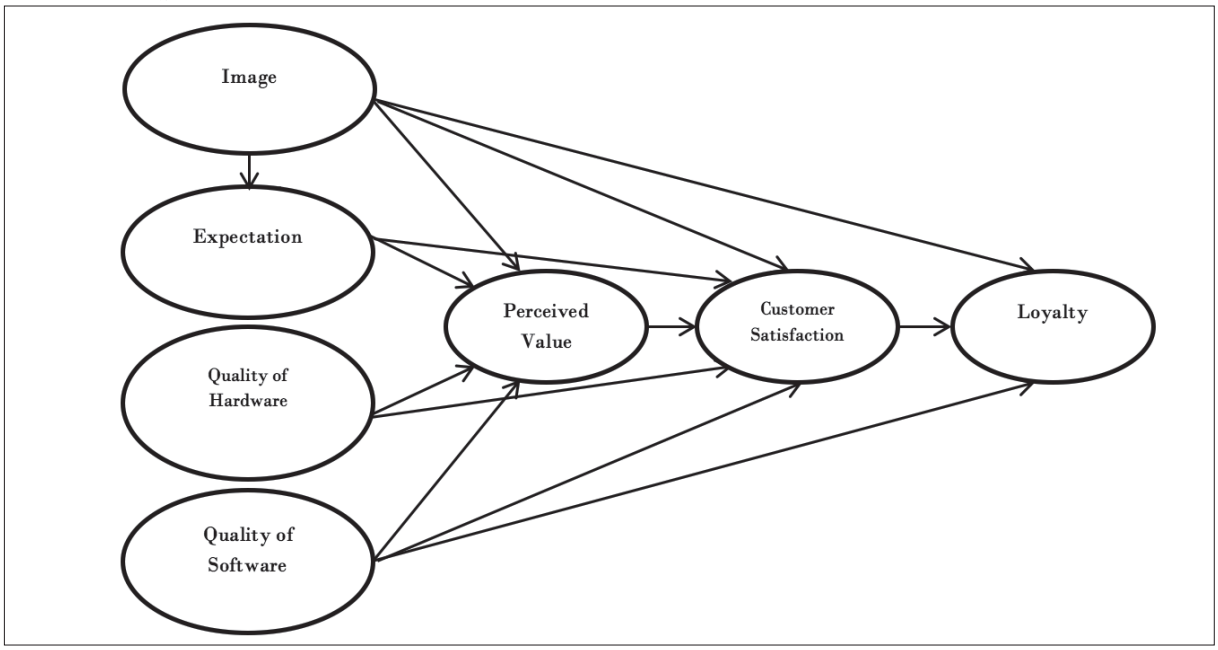
Introduction

Student satisfaction (SS) according to Munteanu, Ceobanu, Bobalca and Anton (2010), is defined as a student's "evaluative summary of direct educational experience, based on the discrepancy between prior expectation and the performance perceived after passing through the educational cycle" (p.126). Shahsavar and Sudzina (2017) define SS as perceived performance of services meeting or exceeding a student's expectations , whereas Weerasinghe and Fernando (2018) define it as "a … [good] attitude based on [a] student's educational experiences" (p. 117). From these three definitions, we may say that SS is a good attitude which a student develops after encountering a service at an educational institution; this attitude arises from the student's expectation of a given service and that student's perception of the service after the student has received it. SS is important to a university because it may lead to student loyalty (Osman & Saputra, 2019), recruitment of students (Munteanu et al., 2010) and high completion rates (Grebennikov & Shah, 2013). SS further boosts a university's image, giving it a competitive advantage (Karna & Julin, 2015), thus leading to profitability (Guilbault, 2017; Mihanovic, Batinic & Pavicic, 2016). SS also plays a fundamental role in the social stability of students at a university (Mayega, 2015; Oliver, 2015). In spite of the importance of SS, universities in Uganda have persistently faced student strikes, which could be an indicator of student dissatisfaction (Mayega, 2015). However, if the challenge of student dissatisfaction in the universities persists, there may be a decline in student loyalty, recruitment of students, and student performance and completion rates. The problem could damage the image of the respective universities which, in turn, might compromise their competitive advantage, hence reducing their profitability. It is, therefore, necessary to find the antecedents of SS and its consequent. In this study, our aim was to use the European Customer Satisfaction Index (ECSI) model (Figure 1) to examine SS in the context of universities in Uganda.

Theoretical Perspective

We anchored our study in the ECSI model (Figure 1) which was developed by the European Organisation for Quality Technical Committee in 1998 (Shahsavar & Sudzina, 2017). The authors of the ECSI model illustrate the relationship between customer satisfaction (CS), its antecedents and consequence.

Figure 1: European Customer Satisfaction Index (ECSI) model



(Source: Shahsavar & Sudzina, 2017, p. 4)

The main variable in the ECSI model (Figure 1) is CS. Angelova and Zekiri (2011) define CS as an emotional reaction to the difference between what a customer anticipates and what they receive. The antecedents of CS as per Figure 1 are image, expectation and the quality of "hardware" and that of "software". Image is defined by Ciavolino and Dahlgaard (2007) as an organisation's brand name and the type of associations a customer gets from the organisation. Ciavolino and Dahlgaard (2007) defined expectations as the level of quality that a customer expects to receive from an organisation and is as a result of a prior consumption experience of a service. The terms quality of "hardware" and quality of "software" refer to service quality (SQ), where SQ is the comparison between a customer's service expectation and their perception of actual performance (Shahsavar & Sudzina, 2017). "Hardware" refers to infrastructure and tangible service elements of the organisation, while "software" refers to people offering the service; and the processes related to the service (Brown & Mazzarol, 2006).

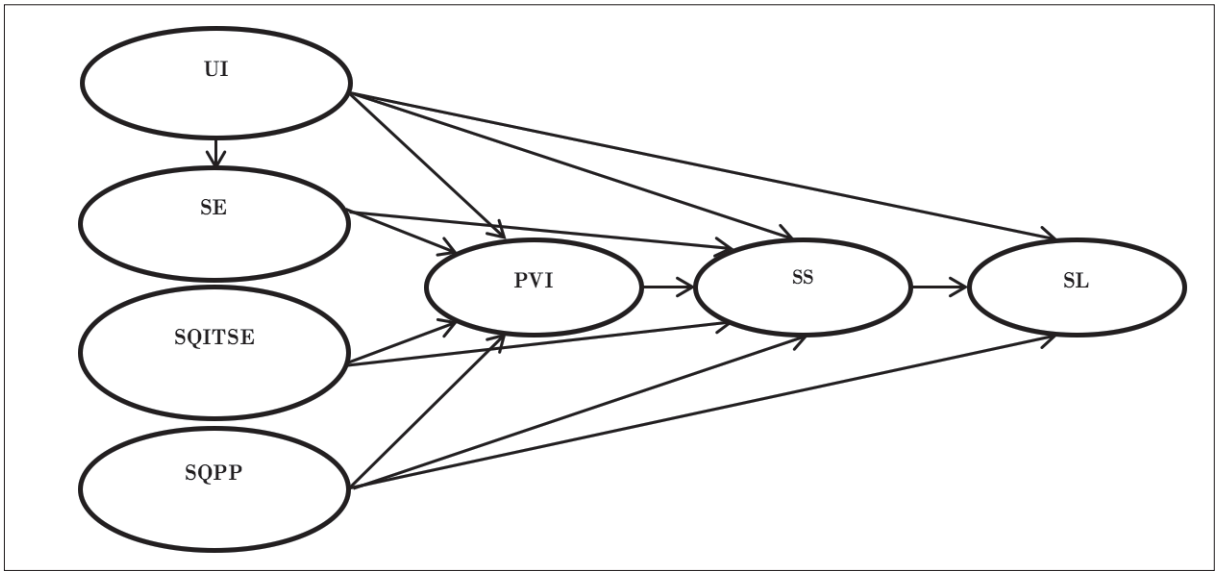
The ECSI model (Figure 1) postulates that the four antecedents of CS (i.e. image, expectation, quality of "hardware" and quality of "software") influence CS through perceived value of investment in a service. Perceived value, according to Caruana, Money and Berthon (2000), is a "consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (p. 1342). Perceived value directly influences CS. The ECSI model (Figure 1) further postulates that customer loyalty (CL) is a consequence of CS. CL, according to Douglas, McClelland and Davies (2008), is a customer's willingness to recommend a product or service to other customers. CL (Figure 1) is directly influenced by two antecedents of CS, namely image and quality of "software". Lastly, the ECSI model (Figure 1) posits that image directly influences expectations.

Theoretical Framework

Based on the ECSI model (Figure 1), we proposed a theoretical framework (Figure 2) elucidating the antecedents and consequent of student satisfaction (SS) in universities. We refer to it as a theoretical

framework because it is based on the entire theory and not parts of it (Lester, 2005). The main variable customer satisfaction (CS) in the ECSI model (Figure 1) is SS (Figure 2) in universities in our study. The antecedents of CS (Figure 1), namely image, expectations and service quality (SQ) of "hardware", SQ of "software" and perceived value are university image (UI), student expectations (SE), SQ of infrastructure and tangible service elements (SQITSE), SQ of people and processes (SQPP) and perceived value of investment (PVI) respectively in our study (Figure 2). The consequence of CS (Figure 1), namely customer loyalty, is student loyalty (SL) (Figure 2) in our study.

Figure 2: Theoretical framework on the antecedents and consequent of SS in a university.



(Source: Adapted from Figure. 1)

Literature Review

In this section, we chronologically review empirical studies in which scholars used the European Customer Satisfaction Index (ECSI) model to explain student satisfaction (SS). Ostergaard and Kristensen (2005) examined the drivers of SS and loyalty in Aarhus School of Business in Denmark. They used quantitative methodology involving a self-administered questionnaires, which they administered to 1,310 undergraduate degree students. Hence using Partial Least Squares (PLS) Path Modelling for analysis, they found that "all inner coefficients proved to be highly significant, having at least a significance level of 0.01" (p. 10). They critiqued themselves for their inability to explain why a negative relationship existed between service quality of people and processes (SQPP) and student loyalty (CL) and yet SQPP predicted SS which predicted SL.

Brown and Mazzarol (2006) explored the factors that influenced SS and SL within a university in Australia. They used a quantitative methodology involving a self-administered questionnaire, which they administered to 373 undergraduate students. Hence using Partial Least Squares (PLS) for analysis, they found that on the antecedents, SS was significantly influenced by university image (IM) and perceived value of investment (PVI). In addition, they found that PVI was significantly influenced by UI. They also found that PVI had an indeterminate relationship with service quality of infrastructure and tangible service elements (SQITSE) and service quality of people and processes (SQPP). On the consequence, SS had a strong relationship with SL and PVI had a strong relationship

with SL. They did not point out any limitations to their study. They also left out the variable student expectations (SE), which is a construct in the ECSI model.

Duarte Raposo and Alves (2012) explored factors that influenced the satisfaction of students with higher education services in Portugal, and whether these factors changed after graduation. They used a quantitative methodology involving a self-administered questionnaire, which they administered to 412 continuing students in their first phase of the study in 2002 and to 150 alumni in the second phase in 2008. Using Partial Least Squares (PLS) Path Modelling for analysis, they found that for both phases one and two, all paths in the model were significant (see Table 3 at p. 16: All their sig or p values < 0.05) except for SE → PVI and UI → SL (Table 3 at p. 16: For both $p > 0.05$). They critiqued the studies that they had reviewed on the basis that there had been "limited research on alumni satisfaction" (p. 20). There is also a geographical gap to the effect that the country (Portugal) to which the study (Duarte et al., 2012) related was/is European, making the study findings not generalisable to especially Africa. The study also used a specific context (one university), leading one to wonder how generalisable the findings were to other universities.

Temizer and Turkyilmaz (2012) examined the use of a Student Satisfaction Index (SSI) model in higher education institutions in Turkey. They used quantitative methodology involving a self-administered questionnaire, which they administered to 454 university graduates. Using Partial Least Squares (PLS) Path Modelling for analysis, they found that student satisfaction (SS) was significantly influenced by service quality (SQ), followed by university image (IM) and perceived value of investment (PVI) and student expectations (SE), had the lowest and most insignificant effect on SS. While Temizer and Turkyilmaz did not mention any limitations to their study, there was a geographical gap in the sense that the country (Turkey) to which their study related was European, making the study findings not generalisable to especially Africa. The study also used a specific context (one private university), leading one to wonder how generalisable the findings were to other universities.

Shahsavar and Sudzina (2017) examined the antecedents of student satisfaction (SS) and their importance to SS and student loyalty (SL) at universities in Denmark. They used a quantitative methodology involving a self-administered questionnaire, which they administered to 1,030 students. Using Partial Least Squares (PLS) Path Modelling for analysis, they found that all paths in the model were significant except for SE → PVI and SQPP → SL. All their sig or p values < 0.05; 0.01. (p. 11, Figure 2). While Shahsavar and Sudzina did not point out any limitations to their study, they claimed that their study findings could be extended to Sweden, Norway and Finland which had similar cultures as Denmark. Since all the four countries are part of one empire, this creates a geographical gap deriving to the fact that all the countries are European, making the study findings not generalisable to Africa.

Eurico, Pinto, Silva and Marques (2018) examined the extent to which the antecedents and consequent of student satisfaction (SS) as measured by the ECSI model change for different sets of higher education consumers in Portugal. They used a quantitative methodology involving a self-administered questionnaire, which they administered to 166 tourism graduates. Using Partial Least Squares (PLS) Path Modelling for analysis, they found that all paths in the model were significant except for SE → SS and SQPP → SS. All their sig or p values < 0.05; 0.10 (p. 219, Table 4). Eurico et al.'s (2018) limitations to their study were to the effect that their results would not be generalised to other countries since they had carried out the study in Portugal, and that they had used a small sample size, which would curtail generalisability. They also pointed out that they had used an

instrument where all items were measured by the same respondent, which could lead to "common method bias" (p. 223).

In summary, out of the six studies, two (i.e. Eurico et al., 2018; Shahsavar & Sudzina, 2017) were recent publications that are less than five years old, while the rest were rather dated publications, being over seven years old. Hence the existence of a gap created by limited recent literature on the application of the ECSI model in explaining SS. Whereas all the six studies applied the ECSI model in explaining SS in higher education, the scholars carried out the studies in countries other than Africa (i.e. Australia [Brown & Mazzarol, 2006]; Denmark [Ostergaard & Kristensen, 2005; Shahsavar & Sudzina, 2017]; Portugal [Duarte et al., 2012; Eurico et al., 2018] and Turkey [Temizer &Turkyilmaz, 2012]). This created a geographical gap, making generalisability of their findings not possible, especially to the Ugandan context. Regarding methodology, all the studies applied the quantitative methodology and used self-administered questionnaires for data collection. In terms of sampling method, except for Duarte et al.(2012) and Ostergaard and Kristensen (2005) who did not reveal their sampling method, the rest of the studies used the random sampling method to select their sample. In terms of the sample sizes, Eurico et al. (2018) had a small sample size of 166 for a quantitative study; the rest had reasonable sample sizes. A small sample size could affect the generalisability of their findings. In terms of analysis, all of the studies used structural equation modelling (SEM) in general and specifically Partial Least Squares (PLS). Regarding results, whereas they applied to the geographical contexts of the studies, they were not generalisable to the Ugandan context. Regarding limitations, only Eurico et al. (2018) raised the issue of limitations in connection with their study on the basis of their having used a small sample size, which curtailed the generalisability of their findings. They also pointed out that they used an instrument where all items were measured by the same respondent, which could lead to "common method bias". Whereas Duarte et al. (2012) did not point out any limitations to their study, they critiqued the studies that they had reviewed on the basis that they had done limited research on alumni satisfaction. In addition, while Ostergaard and Kristensen (2005) and Temizer and Turkyilmaz (2012) did not raise limitations to their studies, their studies used specific contexts (one university), leading one to wonder how generalisable the findings were to other universities.

Hypotheses

We identified some gaps from our literature review. One was the use of a small sample size, as pointed out by Eurico et al. (2018). We also noted an inadequate number of recent publications. Furthermore, there was the use of specific contexts in particular studies carried out in one specific university. Also, all studies were done outside Africa. Hence, we contributed to narrowing the gaps by using a large sample of 704 respondents from seven universities as opposed to one. We also conducted our study in Africa to cater for the geographical gap and the publications from our study will narrow the gap of inadequate recent literature. Thus, our study was about examining student satisfaction (SS) in universities in Uganda using the European Customer Satisfaction Index (ECSI) model. Hence, using our theoretical framework (Figure 2), we developed the following hypotheses which guided our study:

H1. University image (UI), student expectations (SE), service quality of infrastructure and tangible service elements (SQITSE), service quality of people and processes (SQPP) and perceived value of investment (PVI) positively predict student satisfaction (SS).

H2. University image (UI), student expectations (SE), service quality of infrastructure and tangible service elements (SQITSE), service quality of people and processes (SQPP) positively predict perceived value of investment (PVI).
H3. University image (UI), student satisfaction (SS) and service quality of people and processes (SQPP) positively predict student loyalty (SL).
H4. University image (UI) positively predicts student expectations (SE).

Method

Data collection instrument

We collected quantitative data using a self-administered questionnaire which we developed based on instruments (Table 1) which other scholars had tested and used in a number of studies and whose validities and reliabilities we could cite. Table 1 shows the number of items we adapted from the respective instruments and their reliabilities. Our instrument had eleven constructs which we operationalised with four to eight items (see Table 1). We measured the items using a five-point Likert scale from a minimum of one for strongly disagree (SD) or very poor (VP) to a maximum of five for strongly agree (SA) or very good (VG). We ensured the quality of our instrument by adapting the existing tested instruments whose validities and reliabilities were already reasonable (Table 1). We then confirmed face validity and reliability using expert advice from academic supervisors. Furthermore, we carried out confirmatory factor analysis (CFA) (Tables 2 and 3) to identify valid items of each of our constructs. Our CFA results showed that all the items in the constructs, i.e. assurance (A), university image (UI), student expectations (SE), service quality of people and processes (SQPP), perceived value of investment (PVI) and student loyalty (SL), were valid. The CFA results also showed that some items in the constructs, i.e. tangibles (T), reliability (Rel), responsiveness (Res), empathy (E) and service quality of infrastructure and tangible service elements (SQITSE), were not valid, so we dropped them. We then used confirmatory reliability analysis (CRA) (Tables 2 and 3) to confirm if all the valid items in the constructs were also reliable. The alpha results showed that all the valid items in the constructs in our instrument were reliable.

Table 1: Variables, constructs, number of items adapted, source of instrument, items and their reliability

Variable	Construct	Number of items adapted	Source of instrument, number of items and their reliability (α value)
Student Satisfaction (main variable)	Tangibles (T)	4	Parasuraman et al. (1991), 04 items ($\alpha = 0.60$)
	Reliability (Rel)	5	Parasuraman et al. (1991), 05 items ($\alpha = 0.85$)
	Responsiveness (Res)	4	Parasuraman et al. (1991), 04 items ($\alpha = 0.61$)
	Assurance (A)	4	Parasuraman et al. (1991), 04 items ($\alpha = 0.81$)
	Empathy (E)	5	Parasuraman et al. (1991), 05 items ($\alpha = 0.66$)
Explanatory Variables	University image (UI)	6	Ostergaard & Kristensen (2005), 08 items ($\alpha = 0.92$)
	Student expectations (SE)	4	Shahsavar & Sudzina (2017), 04 items ($\alpha = 0.63$)
	SQ of infrastructure & tangible service elements (SQITSE)		Lai et al. (2015), 08 items ($\alpha = 0.80$)
	SQ of people and processes (SQPP)	4	Ostergaard & Kristensen (2005), 04 items ($\alpha = 0.82$)
Intervening Variable	Perceived value of investment (PVI)	5	Duarte et al. (2012), 05 items ($\alpha = 0.925, 0.958$)
Outcome Variable	Student loyalty (SL)	4	Duarte et al. (2012), 04 items ($\alpha = 0.921, 0.959$)

Population and sample

Our parent population was students from all universities in Uganda. However, our sampled population was all students from seven universities in Uganda, namely: Bishop Stuart University (BSU), Kabale University (KAB), Kampala International University (KIU), Makerere University (Mak), Mountains of the Moon University (MMU), Mbarara University of Science and Technology (MUST) and Uganda Christian University (UCU). We considered each university as a cluster. We classified the clusters by size and ownership. KAB and MUST represented small public universities, whereas Mak represented the large ones. BSU and MMU represented small private universities, whereas KIU and UCU represented large ones. We ascertained the population sizes of the universities and then used Krejcie and Morgan's (1970) table to determine the minimum sample sizes. We then selected respondents using convenience sampling. We would go into lecture rooms in the universities and approach any student willing to respond to the questionnaires. The suggested sample size was 2,426 and the sample size attained was 704. Our typical respondent was a male (51.3%) Ugandan student (97%) from the Western region (64.2%) aged 20 and above but below 25 (72.3%). He was from Makerere University (36.2 %) undertaking a bachelor's degree (85.2%), and in his first year of study (46.9%).

Data analysis

We analysed our data at three levels: univariate, bivariate and multivariate. At the univariate level, we used descriptive statistics, i.e. frequencies, percentages and means. At the bivariate level, we used the student's t-test, Analysis of Variance (ANOVA), Pearson's linear correlation coefficient (PLCC), scatter/dot graphs and simple linear regression model (SLRM). At the multivariate level, we used the multiple linear regression model (MLRM). In particular, we tested our four study hypotheses using regression. We tested our first hypothesis (H1) using a MLRM, hence regressed student satisfaction (SS) on university image (UI), student expectations (SE), perceived value of investment (PVI), service quality of infrastructure and tangible service elements (SQITSE) and service quality of people and processes (SQPP). We then tested our second hypothesis (H2) using a MLRM, in which we regressed PVI on UI, SE, SQITSE and SQPP. We tested the third hypothesis (H3) using a MLRM, by regressing student loyalty (SL) on UI, SS and SQPP. Lastly, we tested the fourth hypothesis (H4) using a simple linear regression model (SLRM), by regressing SE on UI. We managed our data using IBM SPSS Statistics.

Results

Student satisfaction

We operationalised our main variable student satisfaction (SS) using Parasuraman et al.'s (1991) SERVQUAL constructs, i.e. tangibles (T), reliability (Rel), responsiveness (Res), assurance (A) and empathy (E). Each item was accompanied by a five-point Likert scale ranging from the worst case of strongly disagree (SD) measured by one (1) to the best case of strongly agree (SA) measured by five (5). In Table 2, we give the means and ratings of the items of each of the five constructs (T, Rel, Res, A, E) of SS. The means of the five constructs of SS as shown in Table 2 implies fair to good levels of satisfaction among the respondents. An average index of SS based on the 31 valid items of the constructs of SS (Table 2) had a mean of 3.52 which, being high, implies that the respondents rated their level of satisfaction with their universities highly.

Table 2: Summary of statistics of the constructs of student satisfaction (SS)

Construct	CFA: No. of valid items (total no. of items)	CRA for the valid items (α)	Mean of the valid items	95% confidence interval for mean of valid items	Interpretation of the rating
T	3 (5)	0.716	3.88	3.81-3.95	High
Rel	8 (10)	0.894	3.26	3.18-3.33	Fair
Res	4 (8)	0.830	3.46	3.39-3.53	Fair
A	8 (8)	0.869	3.68	3.61-3.74	High
E	8 (10)	0.897	3.21	3.13-3.39	Fair
Average index of SS	31 (41)				High

Other explanatory constructs of the ECSI model

In our theoretical framework (Figure 2), the other constructs of the ECSI model were: university image (UI), student expectations (SE), service quality of infrastructure and tangible service elements (SQITSE), service quality of people and processes (SQPP) perceived value of investment in a

university (PVI) and student loyalty (SL). Each item was accompanied by a five-point Likert scale ranging from the worst case of strongly disagree (SD)/very poor (VP) measured by one (1) to the best case of strongly agree (SA)/very good (VG) measured by five (5). In Table 3, we give the means and ratings of the items of each of the other ECSI constructs (UI, SE, SQITSE, SQPP, PVI and SL). Except for the mean of SQITSE, which suggested that the respondents rated their perception of SQITSE as fair, the means of the rest of the constructs (UI, SE, SQPP, PVI and SL) implies that the respondents rated their perception of those constructs as high.

Table 3: Summary of statistics of the other constructs of the ECSI model

Construct	CFA: No. of valid items (total no. of items)	CRA for the valid items (α)	Mean of the valid items	95% confidence interval for mean of valid items	Interpretation of the rating
UI	7 (7)	0.792	3.96	3.89-4.01	High
SE	6 (6)	0.799	3.68	3.62-3.74	High
SQITSE	5 (6)	0.802	3.14	3.07-3.21	Fair
SQPP	4 (4)	0.842	3.86	3.80-3.91	High
PVI	5 (5)	0.759	3.79	3.73-3.86	High
SL	4 (4)	0.835	3.92	3.84-3.99	High

Testing of the hypotheses

We tested four hypotheses (H1-H4) (Figure 2). H1 was to the effect that university image (UI), student expectations (SE), service quality of infrastructure and tangible service elements (SQITSE), service quality of people and processes (SQPP) and perceived value of investment (PVI) positively predicted student satisfaction (SS). H1 had five sub-hypotheses (H1.1-H1.5), namely: H1.1: UI positively predicted SS; H1.2: SE positively predicted SS; H1.3: SQITSE positively predicted SS; H1.4: SQPP positively predicted SS; H1.5 PVI positively predicted SS. Hence, using multiple linear regression (MLRM), we regressed SS onto UI, SE, SQITSE, SQPP and PVI. H2 to the effect that UI, SE, SQITSE and SQPP positively predicted PVI. H2 had four sub-hypotheses (H2.1- H2.4), namely: H2.1: UI positively predicted PVI. H2.2: SE positively predicted PVI; H2.3: SQITSE positively predicted PVI; H2.4: SQPP positively predicted PVI. Hence using MLRM, we regressed PVI onto UI, SE, SQITSE and SQPP. H3 was to the effect that UI, SS and SQPP positively predicted SL. H3 had three sub-hypotheses (H3.1-H3.3), namely: H3.1: UI positively predicted SL; H3.2: SS positively predicted SL; H3.3: SQPP positively predicted SL. Using MLRM, we regressed SL onto UI, SS and SQPP. H4 was to the effect that UI positively predicted SE. Using simple linear regression (SLRM), we regressed SE onto UI. We present the results of the four hypotheses (H1-H4) in Table 4.

Table 4: Results from the linear regression models for testing the hypotheses

Hypotheses	Sub-hypotheses	Path	Measures of the goodness of the model	Standardised coefficients, β, and p value	Hypotheses supported?
H1	H1.1	UI → SS	Adj R^2 = 0.508, F = 87.608, p = 0.000	β = 0.190, p = 0.000	Yes
	H1.2	SE → SS		β = 0.282, p = 0.000	Yes
	H1.3	SQITSE ¬ SS		β = 0.028, p = 0.485	No
	H1.4	SQPP → SS		β = 0.229, p = 0.000	Yes
	H1.5	PVI → SS		β = 0.178, p = 0.000	Yes
H2	H2.1	UI → PVI	Adj R^2 = 0.429, F = 104.579, p = 0.000	β = 0.220, p = 0.000	Yes
	H2.2	SE → PVI		β = 0.191 p = 0.000	Yes
	H2.3	SQITSE → PVI		β = 0.123, p = 0.001	Yes
	H2.4	SQPP → PVI		β = 0.300, p = 0.000	Yes
H3	H3.1	UI → SL	Adj R^2 = 0.276, F = 57.039, p = 0.000	β = 0.205, p = 0.000	Yes
	H3.2	SS → SL		β = 0.149, p = 0.000	Yes
	H3.3	SQPP → SL		β = 0.272, p = 0.000	Yes
H4		UI → SE	Adj R^2 = 0.318, F = 290.893, p = 0.000	β = 0.565, p = 0.000	Yes

Discussion

Our results from the MLR (Table 4) gave support to H1 and its sub-hypotheses H1.1, H1.2, H1.4 and H1.5 but rejected H1.3. Our finding on H1.1 to the effect that UI positively predicted SS was consistent with those of Eurico et al. (2018) and Shahsavar and Sudzina (2017). Our finding on H1.2 to the effect that SE predicted SS was consistent with Alves and Raposo's (2007) but different from those of scholars (i.e. Duarte et al., 2012; Temizer & Turkyilmaz, 2012; Shahsavar & Sudzina, 2017; Eurico et al., 2018) whose findings showed that SE did not predict SS. With regard to H1.3 to the effect that SQITSE positively predicted SS, our finding was consistent with Alves and Raposo's (2007) but different from that of Shahsavar and Sudzina (2018), who reported that SS was predicted by SQITSE. Our finding on H1.4 to the effect that SQPP positively predicted SS was similar to Ostergaard and Kristensen's (2005) but differed from that of Eurico et al. (2018), who found that SS was not predicted by SQPP. Regarding H1.5, to the effect that PVI positively predicted SS, our

finding was similar to those of researchers (e.g. Shahsavar & Sudzina, 2017; Eurico et al., 2018) who found that PVI predicted SS. In terms of which independent variables (IV) (UI, SE, SQITSE, SQPP and PVI) was the strongest predictor of the dependent variable (DV) SS, we found that SE was the strongest predictor of SS. This was a finding different from those of researchers (e.g., Eurico et al., 2018; Shahsavar & Sudzina, 2017), who found a weak link between SE and SS. The implication of our findings on H1 is that in their quest to improve SS, university authorities should allocate time and resources to improving and maintaining their university brands. They should also recruit quality staff (i.e. academic and administrative) and ensure that their staff have good customer care. Universities should offer value for students' time and money, i.e. the services offered should be commensurate with what the universities charge. Finally, our finding draws attention to the fact that SE was the strongest predictor of SS, implying that universities should manage their students' expectations by delivering on what they promise and by consistently engaging with students to find out their expectations.

The results from the MLM (Table 4) gave support to H2 and its sub-hypotheses H2.1-H2.4. Our finding on H2.1 suggested that UI positively predicted PVI, which is consistent with Shahsavar and Sudzina's (2018). In turn, the finding on H2.2, which suggested that SE positively predicted PVI, is similar to that of Shahsavar and Sudzina (2017) but differed from that of Temizer and Turkyilmaz (2012), whose finding showed that SE did not predict PVI. Our result on H2.3, which suggested that SQITSE positively predicted PVI, is consistent with the results of Shahsavar and Sudzina (2017) and Temizer and Turkyilmaz (2012) but differ from those of Alves and Raposo (2007) and Brown and Mazzarol (2006), whose results, respectively, suggested that SQITSE did not predict PVI. In turn, our result on H2.4, which suggested that SQPP positively predicted PVI, was consistent with the results of some researchers (e.g. Shahsavar & Sudzina, 2017; Temizer & Turkyilmaz, 2012) but differed from those of Eurico et al. (2018), whose results suggested that SQPP did not predict PVI. Ostergaard and Kristensen (2005) found that SQITSE and SQPP had a strong link with PVI whereas Brown and Mazzarol (2006) found a weak link between SQITSE and SQPP and PVI. This contradiction points to the need for further investigation on the link between service quality (SQ) and PVI. In terms of which IV (UI, SE, SQITSE and SQPP) was the strongest predictor of the DV (PVI), we found that SQPP was the strongest predictor of PVI, a result similar to Ostergaard and Kristensen's (2005) but different from that of Brown and Mazzarol (2006), who found a weak link between SQPP and PVI. Since PVI is a predictor of SS (H1), university authorities should ensure that the predictors of PVI (UI, SE, SQITSE and SQPP) are improved, in particular, SQPP, which involves quality of university staff and the process of service delivery. The university authorities should continuously carry out re-tooling of their staff to ensure quality in service delivery. They should also simplify the processes of service delivery and make them known to the students.

The MLR results (Table 4) supported hypothesis H3 and sub-hypotheses H3.1, H3.2 and H3.3. Our finding on H3.1, which suggested that UI positively predicted SL, was consistent with Eurico et al.'s (2018), Shahsavar and Sudzina's (2017) and Temizer and Turkyilmaz's (2012). In turn, our result on H2.2, which suggested that SS positively predicted SL, is in line with Alves and Raposo's (2007). The result on H3.3, which suggested that SQPP positively predicted SL, is similar to Shahsavar and Sudzina's (2017) but differed from that of Ostergaard and Kristensen (2005), who found that SQPP did not predict SL. In reference to which of the IVs (UI, SS and SQPP) was the strongest predictor of the DV (SL), we found that SQPP was the strongest predictor of SL. Our finding differed from that of Alves and Raposo (2006), who reported that "student's loyalty was the main consequence for satisfaction, given that… [SS] had a direct influence… in loyalty" (p. 1276). It also differed from that

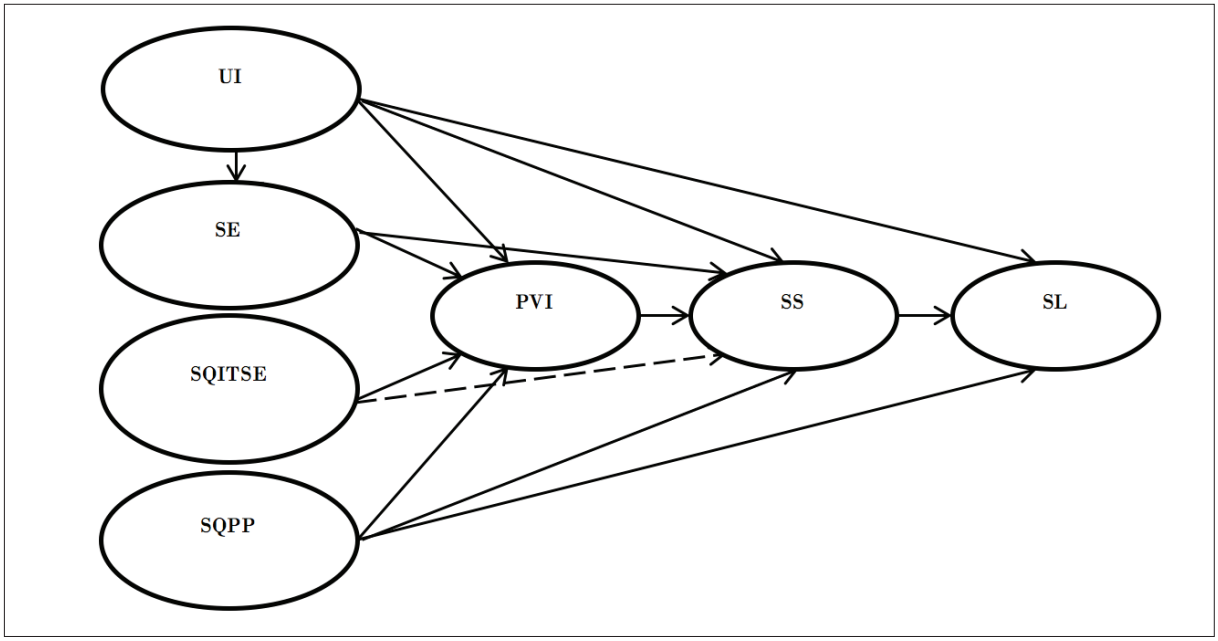
of Ostergaard and Kristensen (2005), who found a weak link between SQPP and SL. The implication of our finding is that in order for universities to improve SL, which is positive recommendation of the university by students, they should improve on the university brand, SS as well as the quality of their staff and processes of service delivery. Universities should in particular improve the quality of their staff and boost their service delivery processes. Our findings imply that students are loyal to universities who have quality staff and whose service delivery processes are of high quality.

The SLR results (Table 4) gave support to H4 to the effect that UI positively predicted SE. Our finding was consistent with that of Alves and Raposo (2007), who found that the "influence of [UI] is also significant in the formation of student's expectations in higher education" (p. 1275). Universities should, therefore, manage their students' expectations by managing their university brands.

Conclusions

We sought to examine SS in universities in Uganda using the ECSI model. Based on the ECSI model (Figure 1), we developed a theoretical framework (Figure 2) with four hypotheses H1-H4, which guided our study. Our linear regression results (Table 4) supported the four hypotheses except sub-hypothesis H1.3, which revealed that SQITSE did not predict SS. We concluded that the ECSI model was an appropriate model for examining SS in universities in Uganda. In order to enhance SS, we recommend that university authorities improve their university brands (UI), know their student expectations (SE) and manage them, recruit, retrain and retool their staff and improve their service delivery processes (SQPP), and offer value for the students' time and money (PVI). When SS is improved, it invariably leads to student recommendations of the university (SL). Furthermore, we proposed a slight modification to our theoretical framework (Figure 3), describing a new pattern of the European Customer Satisfaction Index (ECSI) model for examining student satisfaction (SS). Unlike our theoretical framework in Figure 2, Figure 3 suggests that the link between SQITSE and SS is loose (not supported) while the rest of the links are firm (supported).

Figure 3: Modified theoretical framework relating the explanatory variables of ECSI that significantly and non-significantly (i.e. SQITSE) predicted SS.



Note: Dotted line suggests an unsupported hypothesis.

Limitations and Areas of Further Study

We carried out our study in seven universities in Uganda out of over 51 universities. This may limit the generalisation of our findings to those universities. Our sample was dominated by students from the Western region; students aged between 20-25; students undertaking bachelor's degrees; and students in their first year of study. We conducted our research in a developing country. Lastly, our study was quantitative. We recommend that a similar study is conducted in other universities in Uganda, and on a sample structure with characteristics catering for those we left out. We also recommend a similar study using the interpretivist paradigm.

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Factors Affecting Students' Performance, Enrolment and Retention in Science Subjects in Secondary Schools in Uganda: A Case Study of Kigezi Region of Uganda

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Abstract

In this paper, we investigate the teaching of science subjects before and after the lockdown and explore the factors that affect students' confidence in passing national examinations. The research was carried out in the districts of the Kigezi region in Uganda, where 435 students from 12 schools and 60 science teachers provided both qualitative and quantitative data on the state of science education before, during and post the Covid-19-induced lockdown through interviews and questionnaires. Multiple regression analysis was performed to establish the relationship between syllabus coverage, practical coverage, likability of the science subjects, and confidence in passing both school and national examinations. We note that poor syllabus coverage and lack of adequate practical time are often blamed for the poor pass rates in science subjects in secondary schools in Uganda, but this research indicates that blaming these two alone is simplistic at best. Our results show that although the two factors are important to students by themselves, they are not the only determinants of students' confidence in success in national examinations. We show that subject likability is an indispensable determinant of students' confidence in passing science subjects in national examinations, and together with practical teaching as well as syllabus coverage, a winning formula for improving confidence in passing and ultimately enrolment is obtained. From this, we conclude that

improving students' attitude and perception of science should be emphasized as much as advocacy for practical teaching and completion of the syllabus in time. This will improve students' perception and performance in the sciences with the overall effect of boosting retention rates in STEM subjects.

Keywords: *STEM; multiple regression; Covid-19; science enrolment; student motivation; likability*

Introduction

The teaching of science subjects in all secondary schools in Uganda has been compulsory at O' level since 2005. The policy was followed by a reduction in the number of government-sponsored students doing arts at university level and an increase in the proportion of science students sponsored by the state at university level (Kabunga, Mohamed & Mnjokava, 2016). Despite the policy efforts by the Ministry of Education, performance in science subjects at O' level (in the national examinations) has been persistently poor through the years and enrolment at A' level is still very low. This continues to worry the Ministry of Education and the Government of Uganda (Africanews, 2017; Uganda National Commission for UNESCO, 2017). According to the Uganda National Examinations Board (UNEB), poor performance has been attributed to poor syllabus coverage and lack of adequate preparedness to handle practical components of the subjects (*The Monitor*, 2019, March 1). Indeed, many students face anxiety in handling science apparatus and making observations due to inadequate practice, yet this is only the first phase of scientific experiments (Ghartley-Ampiah, Tufuor, & Gadzekpo, 2004).

This presents challenges in attaining the national development goals set up by the government. The emergence and spread of Covid-19 challenged science education worldwide. For example, Yu et al. (2022) notes that the shift to online learning posed a particular challenge to instruction in science subjects and courses where hands-on training and collaboration are required. They also found that marginalized groups of students in sciences were disproportionately burdened by the pandemic-induced shift to online learning. In Uganda, the year-long Covid-19-induced lockdown acerbated the problems of science education by keeping many students away from school with little to no formal education.

According to a study by the MasterCard Foundation (MasterCard Foundation, 2021), enrolment for secondary school education in Uganda has been increasing steadily yet that same growth is not proportionately reflected in enrolment for science education. This has resulted in a shortage of skilled professionals in science-related fields. For instance, laboratory sciences and systems are among the most neglected components of the health systems in Uganda, with only 50% of the posts for laboratory technologists filled (Kiwanuka et al., 2020), highlighting a need for more scientists to reduce the heavy workload on those available. In order for students to continue with STEM (Science Technology, Engineering and Mathematics) subjects at post-secondary institutions and STEM careers later on, they need to perform adequately well in UNEB examinations, as these are used to determine students' achievement and progression to higher levels of education in the country. Poor academic achievement has been linked to poor economic development of individuals and their social economic status (Kabunga et al., 2016).

We also note that since students with poor results in the sciences are not selected to continue with STEM subjects at the university level, the country does not produce enough skilled professionals

in STEM fields to support its growing population (ADF 2012). This puts excess pressure on the few professionals available. These challenges existed before the emergence of Covid-19 in 2019, and the consequent lockdown in 2020 and 2021 only worsened this reality (Schults, Callahan, & Miltiadous, 2020). The drastic changes in the education system that followed the Covid-19 pandemic threaten to make education achievement, enrolment and retention figure in the sciences worse than they already are due to rampant dropout rates and poor achievement of learning outcomes, resulting in even worse performance. The World Bank report of 2020 estimated that school closures not exceeding five months could lead to falling test scores and to as much as a 25% increase in the number of children in lower secondary school levels with skills below the expected minimum level of proficiency. This paints a very bleak picture for science education in Uganda, where the lockdown stretched for more than a year. There is an urgent need to take deliberate steps to strengthen the teaching and learning of sciences, as well as steps to encourage students to enroll in the sciences and bolster students' understanding and achievement. Otherwise, the situation threatens to weaken government development plans and slow down the transformation of the country to middle-class status.

Uganda's Vision 2040 notes that Science, Technology, Engineering and Innovation (STEI) has a high potential to transform communities and increase the country's productivity and competitiveness. However, Uganda has not fully participated in the technological revolution taking place in the world and the country lacks adequate people in technology and scientists (ADF, 2012). Furthermore, the National Development Plan III (NDP III), section 2.4.1 notes that in order for the country to meet its national and international obligations (SDG goals, Africa Union Agenda 2050 and East Africa Vision 2063), the country needs to invest substantially in science, technology and innovation. This starts with giving adequate quality training to its youth to prepare them for the industrial clusters, engineering and innovation hubs that are to be built by the government (Uganda Vision 2040, section 4.2.4). Furthermore, countries around the world cannot afford to have populations with little to no interest in science since some scientific inventions come with ethical and social issues whose solutions need to go beyond science itself (Galvao, Reis, Freire, & Almeida, 2010). Hence the need for a good quality science education at secondary school level, even for students who may not wish to pursue a career in sciences.

In this paper, we tested the commonest hypotheses that have been repeatedly put forward by the UNEB concerning poor performance: that poor syllabus coverage and lack of adequate practical experience are the major sources of the high failure rates (*The Monitor*, 2019, March 1). Twahirwa and Twizeyimana (2020) argue that practice-based teaching is core to science learning and improves test scores in physics, while Shana and Abulibdeh (2020) carried out research on tenth grade chemistry and biology students and their results confirmed that practical work improved test scores. From this perspective, the claim by UNEB appears to be partly true. Despite the improvements in the provision of laboratory equipment in government-aided schools, performance continues to be low, so we seek to determine whether there are other factors affecting students' performance in UNEB examinations. We also felt that the quantity of practicals performed should be positively correlated with the amount of syllabus that is covered. It has also been suggested that increasing the number of practicals improves students' likability of the subject. We tested this hypothesis as well. Against this background, some of the hypotheses we had before embarking on the research was that inadequate practicals and poor syllabus coverage were the leading cause of poor performance in science subjects in Uganda and set out to determine the extent to which these factors affected students' confidence in passing UNEB examinations.

Research Objectives

The objectives of this research are: to determine the effect of practical work and syllabus coverage on student performance in science subjects in UNEB examinations; and to investigate the relationship between likability, practicals, syllabus coverage, school assessments and students' confidence in their ability to pass national examinations (UNEB).

Methodology

This research focuses on secondary school education, both O' and A' level. Hence the key target groups were stakeholders in secondary science education, specifically science students and secondary school science teachers in both private and public schools. The research was carried out in the Kigezi region, southwestern Uganda in the districts of Kabale, Kanungu, Rukungiri, Kisoro, Rukiga and Rubanda. Qualitative and quantitative data was collected through interviews and questionnaires to establish how the alternative learning approaches impacted learners' science education experiences as well as ascertaining the general state of science education in the region. Discussions pertaining to the situation and perception of science education before, during and after the Covid-19 lockdown were held at these schools with the students independently as well as with the science teachers.

Sampling design

According to Uganda Ministry of Education statistics, there are on average about 27 schools (government and private) per district in the sub-region. The sampling frame is the list of all secondary schools within the entire sub-region. With a target student population of over 10,000, a sample size of about 375 is sufficient (Leslie, 1965; Krejcie & Morgan, 1970). In line with the objectives of this research, two schools per district were purposively sampled so as to have a proper mix of government-aided and privately owned schools per district, and to improve the reliability of our results, some schools were chosen from urban areas while others were rural schools. In total, our data was obtained from 12 schools. Four hundred thirty-five students were randomly chosen from the 12 schools in the six districts. This sample size is large enough to ensure that the anticipated inferential tests such as t-tests or ANOVA, at 0.05 significance level, have strong power of test (Sink & Mvududu, 2010).

Data analysis

Inferential tests such as ANOVA as well as multiple regression analysis were then used to study the interdependencies among the data and the respective inference of such results to the whole population of science education stakeholders in the Kigezi region. Multiple regression was the appropriate tool to use to establish the relationship between different independent variables and the dependent variable and multiple regression shows how each independent variable is related to the dependent variable (Petchko, 2018). In this research, we used the P-value or significance probability at a 5% level so that whenever a P-value less than 0.05 is obtained, we conclude that the results are statistically significant while $P > 0.05$ was interpreted as not as significant. In statistics, the (R Square) value is used to determine the level of variance between the dependent variable and the independent variable(s). When more than one independent variable is used, or when the data sample is small, the Adjusted R-squared value is preferred as it controls over-estimates of the population results from small data samples (Reisinger, 1997). We considered a model to be good if the Adjusted R-squared value was at least 0.5% and significant or strong if it was at least 0.8.

Results

Students were asked to choose one science subject out of the five and rate it on a scale of 1–5, with 1 representing the lowest mark and 5 the highest on aspects of syllabus coverage, conduct of practicals, likability (how well they liked the subject), their confidence in passing school assessments and UNEB examinations before, during and after the lockdown. Likability of the subjects was included for two reasons: the first reason is that it could have influenced the levels of respondents' satisfaction with the various alternative learning approaches that were adopted during and after the lockdown to aid the learning process. As noted by Feistauer and Richter (2018), likability of a teacher and students' interest in a subject have a tendency to bias students' responses. The second reason is that likability of subjects could have varied before and after the lockdown. This could be due to the effectiveness of the alternative approaches that were used to teach the different subjects during the lockdown and a shift in perspectives by the learners resulting from learners placing their emphasis on certain subjects depending on future career aspirations. Finally, since the performance of students in UNEB examinations greatly affects enrolment and retention in science subjects at A' level and in post-secondary institutions, we investigated the relationship between students' UNEB expectation levels and the other factors by considering it as a dependent variable.

Fifty-five students chose to rate physics, 33 students chose chemistry, 77 chose mathematics, 68 chose biology and 30 chose agriculture, and the rest of the students did not answer that question. The results are summarized in the table below:

Before the lockdown

Table 1: Summary of respondents who rated the science subjects

Chemistry Before						**Biology Before**				
Rating	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment
1	13	3	9	2	1	26	10	15	6	6
2	9	2	12	3	1	12	3	17	5	5
3	5	6	11	3	7	7	7	13	7	5
4	1	5	8	7	8	6	12	7	12	19
5	4	12	7	19	16	12	25	16	31	32
Physics						**Mathematics**				
Rating	Practicals	Likability	Syllabus Coverage	UNEB	School Assess	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment
1	26	7	18	7	3	19	8	19	10	7
2	7	10	13	4	1	6	8	15	7	9
3	9	5	10	9	4	6	19	15	4	11
4	2	7	6	7	3	4	6	10	17	21
5	11	20	10	26	12	11	30	15	36	25

Agriculture					
Rating	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment
1	14	4	3	2	2
2	3	6	10	4	2
3	2	6	7	4	10
4	5	3	5	10	12
5	5	8	5	9	3

Physics

Likability vs practical coverage: There was a negative Adjusted R-squared Value and a high standard error, which indicates that practical coverage was not a deciding factor in likability of physics before the lockdown or that the model suggesting that likability of the subject depends on how much practical work is given should be rejected.

Confidence in passing UNEB vs practical coverage, syllabus coverage: Regression analysis showed a negative Adjusted R-squared value, a standard error of 10.1 and a high P-value of 0.97, all of which indicate that practicals are not the only determinants of students' confidence in passing UNEB and the model should be rejected. Similar results were obtained when confidence in passing UNEB was tested against syllabus coverage. Therefore, none of the usual reasons given, when taken as single independent variables, determine students' confidence in passing national examination. Even when combined, practical coverage and syllabus coverage, as the only independent variables, generated negative adjusted R-squared values, an indication that the model is false. Hence, contrary to popular belief, there is more to students' failure in physics national examinations than just poor syllabus coverage and inadequate number of practicals. We, therefore, explored further to determine any other factors that might be at play.

UNEB vs subject likability: There was a positive Adjusted R-squared value of 0.685 (standard error of 4.94) and a P-value of 0.053. Furthermore, the slope was determined to be 1.29, and all these indicate a positive relationship between students' confidence in passing UNEB examinations and how much they like the subject. However, if only 68% of students' confidence is attributed to likability, there must be other factors that decide confidence.

Confidence in passing UNEB examinations vs confidence in passing school assessments: This proved to be the single most influential factor in students' confidence in passing national examinations before the lockdown, with regression analysis giving an adjusted R-squared value of 0.996, a small standard error of 0.578 and a positive slope of 2.05, all indicating that students who were confident in their ability to pass school assessments also had high hopes of passing national examinations.

We note that when the two factors (likability and confidence in passing school assessments) were combined as independent variables, the best model was obtained with an adjusted R-squared value of 0.9991 (standard error of 0.26, positive gradients of 1.88 in the case of school assessments and 0.146 for subject likability). This indicates that 99.9% of variability in students' confidence in passing national examinations can be attributed to these two factors combined. Furthermore, a P-value of 0.0009 for school assessment and 0.07 for likability indicate that school assessments play a big role in shaping students' confidence in passing the subject.

Biology

Likability vs practical coverage: It is often claimed that doing more practicals improves students' likability of the subject. Using likability as the dependent variable and practical coverage as the independent variable, regression analysis showed that before the lockdown practical coverage by itself was not the deciding factor in likability of biology. Indeed, the Adjusted R-squared value was negative, the standard error was high at 9.61, the slope was very small and negative (-0.005) and the P-value was high at 0.99, all indicating that there was no relationship between practical coverage and likability of biology.

Confidence in passing UNEB vs practical coverage, syllabus coverage: There was no relationship between confidence in passing national examinations and practical coverage. The adjusted R-squared value was negative and the standard error was high at 12.3, indicating high variability in the answers given, and a high P-value of 0.78 indicates that we should reject the hypothesis that practical coverage alone determines students' confidence in passing examinations. Likewise, there was no relationship between students' confidence in passing national examinations and syllabus coverage (negative R-squared value). Even when the two variables were taken as both being independent variables, we did not get better results. Therefore, practicals and syllabus coverage are not the deciding factors in students' confidence in passing national examinations.

UNEB vs subject likability: Subject likability plays a very crucial part in students' confidence in passing UNEB examinations, and it was the biggest contributor to students' confidence. Here, over 90.1% of their confidence can be attributed to how well they liked the subject (P-value = 0.009 < 0.05). However, their confidence is also strongly correlated with confidence in passing school assessments (with Adjusted R-squared value of 89.5% and a P-value of 0.01). The best model was, however, obtained when practicals, syllabus coverage and likability of the subject were taken as independent variables, with 97% of students' confidence attributed to these three factors. The standard error was 1.87.

Mathematics

This produced surprising results in that it is the only subject considered where there is no single factor that determines students' confidence in passing national examinations before the lockdown. Since there are no practicals conducted in the traditional sense, it should be taken that students who chose to rate the subject in this regard interpreted "practical" as revision, where they were actively involved through personally solving equations.

Confidence in passing UNEB examinations vs practical: There was no meaningful relationship between the two variables since the adjusted R-squared value was negative, the standard error was 14.7 and the P-value was very high at 0.8. Therefore, students felt that practice alone could not determine their success in the national examinations.

Confidence in passing UNEB examinations vs syllabus coverage: There was no meaningful relationship between the two variables since the adjusted R-squared value was negative.

UNEB vs likability: There is a weak positive relationship between the two values with a low adjusted R Square value (0.242), a high standard error of 11.14, indicating high variability in the data, a small positive slope and a high P-value (0.228), which indicates that it is not the only factor determining students' confidence in passing national examinations.

UNEB vs school assessment: There was a positive relationship between the two factors (adjusted R-squared value of 0.680, standard error of 72.4, a positive gradient of 1.4 but with a slightly high

P-value of 0.053). This indicates that as students engage more with school assessments with well-planned revision sessions, their confidence grows, thus improving their chances of passing the national examinations.

Although 68% of their confidence in passing national examinations can be attributed to their confidence in passing school assessments, we cannot conclude that this is the only factor (due to the high P-value greater than 0.05). So, we experimented with a combination of factors using multiple regression and found that practicals, likability and confidence in passing school assessments can account for up to 77.9% of their confidence in passing UNEB; but the best model is obtained through a combination of confidence in passing school assessments, practicals and syllabus coverage which, when combined, can account for up to 85.6% of their confidence. However, the best model shows that confidence in UNEB is determined by their confidence in passing school assessments coupled with syllabus coverage (Adjusted R-squared value of 92.1%, standard error of 3.59). Therefore, teachers should endeavor to cover adequate amounts of the syllabus and aim to improve the students' mathematical abilities overall by raising confidence levels in passing school assessments and devising strategies to help revise the content.

Agriculture

Confidence in passing UNEB vs syllabus coverage; practical coverage; and students' confidence in passing school assessments: There was a very weak negative relationship between syllabus coverage, practical coverage and students' confidence in passing UNEB examinations. This is surprising, considering that one would expect that the more the hands-on practice, the more exposed students would become and hence increase their confidence in passing the subject.

UNEB vs likability: There was no meaningful relationship between the two variables (Adjusted R-squared value of -0.33, standard error of 4.02 and a P-value of $0.9 >> 0.05$), which indicates that students' responses regarding confidence in passing the examinations was not attributed to how well they liked the subject.

From the data, there were no clear results indicating students' confidence in passing examinations in this subject before the lockdown. Most combinations resulted in negative values, which were then rejected because they made no sense. This may suggest that more information is needed. There was, however, one relationship from the data that seemed to make sense, although the results were still weak, as shown below.

Chemistry

Practical coverage vs syllabus coverage: There was no meaningful relationship between the two variables, with negative adjusted R-squared and high P-values. Hence, these results show that there were other factors that determined the number of practical sessions students had other than syllabus coverage alone.

Likability vs practical coverage: It is often claimed that with more practical sessions organised, the most likable a science subject becomes. However, our data and analysis indicated that this is not true. The relationship between likability (the dependent variable) and practical coverage is weak at best, with an adjusted R-squared value of 0.051 and a high P-value of 3.8 and a negative slope, suggesting that there are other factors at play besides practicals.

Confidence in passing UNEB examinations vs likability: There was a positive relationship between the two variables and the Adjusted R-squared value of 0.809 (standard error of 3.1, slope of 1.68 and a P-value of $0.02 < 0.05$), which suggests that likability of the subject could not be discarded as a

factor influencing students' confidence in passing the subject in examinations. Another combination of factors with positive responses includes likability, practical coverage and confidence in passing school assessments, with this combination giving an adjusted R-squared value of 0.87, standard error of 2.5. This suggests that before the lockdown, students' confidence in passing national examinations depended on likability, practical coverage as well as their confidence in passing school assessments.

After the lockdown

Table 2: Students' rating of science subjects after the lockdown

Chemistry						Biology				
Rating	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment
1	4	4	5	2	1	9	8	7	9	11
2	12	7	14	6	7	15	5	13	7	6
3	4	6	9	5	5	16	9	15	10	17
4	5	1	12	5	9	13	16	18	17	17
5	6	11	7	15	11	10	21	15	20	16
Physics						**Mathematics**				
Rating	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment
1	7	8	7	5	2	9	8	10	6	9
2	12	1	11	4	5	8	10	11	3	4
3	9	12	11	12	5	7	7	14	11	11
4	5	10	16	6	6	6	8	11	16	17
5	20	18	12	26	6	15	34	23	40	36
Agriculture										
Rating	Practicals	Likability	Syllabus Coverage	UNEB	School Assessment					
1	7	3	1	0	0					
2	6	3	6	1	4					
3	5	4	6	4	5					
4	4	6	7	6	9					
5	6	11	10	12	10					

In Table 3, we show a summary of some of the multiple regression results obtained. Here, only the best model results are shown.

Table 3: Summary of some regression results

Chemistry			Physics			Biology		
R-squared	0.9984		0.9978			0.9999		
Adjusted R-squared	0.9938		0.9911			0.9996		
Standard error	0.3877		0.8654			0.109		
	Slope	**P-value**		**slope**	**P-value**		**slope**	**P-value**
Syllabus coverage	-0.40	0.10	Practicals	0.843	0.065	Practicals	-0.464	0.092
Likability	0.60	0.07	Likability	0.895	0.520	Syllabus coverage	0.453	0.074
School assessment	0.97	0.04	School assessment	0.273	0.057	Likability	0.609	0.034

Physics

UNEB vs practical coverage: There was a positive relationship between students' confidence in passing UNEB and the number of practicals given. This was indicated by the positive slope, a positive adjusted R-squared value of 0.597 and a standard error of 5.81, suggesting that 59.7% of the variability in students' confidence can be attributed to the number of practicals conducted. However, the P-value is bigger than 0.05, indicating that there are other factors at play.

UNEB vs likability: Analysis showed that the most significant factors affecting students' confidence in passing national examinations include likability, practicals and syllabus coverage (with 98.7% of the confidence attributed to this combination, at a standard error of 1.04). Practical coverage, confidence in passing school assessments and likability (with 99% of the variability in their confidence attributed to these factors, at a standard error of 0.87) were the most important factors and they provided the best model to explain students' confidence in passing UNEB examinations.

UNEB vs syllabus coverage: Furthermore, using syllabus coverage alone as the independent variable does not yield good results. Indeed, the adjusted R-squared value is negative, indicating that this is not a good model. The best model is therefore obtained when likability of the subject is taken into consideration along with the amount of practical work and syllabus coverage given to students.

Chemistry

Confidence in passing UNEB examinations vs likability: There was a positive relationship between the two variables but it became weaker, with only 52.6% of the confidence attributed to how well the subject is liked (at a standard error of 3.4). A P-value of 0.1 indicates that likability was not the only important factor. However, likability of the subject, confidence in passing school assessment and syllabus coverage provided the best model with an adjusted R-squared value of 0.994, a standard error of only 0.3877 and a small P-value for school assessment (0.04), indicating that this cannot be discarded as an independent variable.

Confidence in passing UNEB examinations vs syllabus coverage and practical coverage: There was no meaningful relationship between the two independent variables and the dependent variable since a negative adjusted R-squared value is obtained. This indicates that even after the lockdown was lifted, students' confidence in passing national examinations was not determined by syllabus and practical coverage but by other factors.

Mathematics

Considering confidence in passing UNEB examinations and using each of the other four variables as independent variables resulted in positive adjusted R-squared values, indicating that all the four factors are needed (to varying degrees), but the best model involves confidence in school assessments, syllabus coverage and the amount of practice students have (adjusted R-squared of 0.996, standard error of 0.930). However, likability, syllabus coverage and confidence in passing school assessments present a good model with adjusted R-squared values of 0.993.

Biology

Confidence in passing UNEB examinations vs syllabus coverage: It was shown that there is a very weak positive relationship between students' confidence in passing UNEB and syllabus coverage,with only 11.5% (from an adjusted R-squared value of 0.115 and a standard error of 5.3) of the variability in confidence attributed to syllabus coverage. This suggests that covering the syllabus alone may not be enough to get students to pass the national examinations and continue with life sciences.

Confidence in passing UNEB examinations vs likability and syllabus coverage: Multiple regression analysis showed that the best model involves practical coverage, likability and syllabus coverage (adjusted R-squared of 0.9996 with a standard error of 0.11). However, covering enough syllabus, raising students' confidence in passing school assessments as well as improving likability of the subject also provide a good basis for raising students' confidence in passing UNEB, with an adjusted R-squared value of 0.983 and a standard error of 0.74.

Agriculture

Regression analysis showed that there was no meaningful relationship between practical coverage and students' confidence in passing UNEB examinations (negative R square valued obtained) and, similarly, a positive relationship exists between syllabus coverage as the sole independent variable and confidence in national examinations. Indeed, with an adjusted R-squared value of 0.682, 68.2% of variability in students' confidence can be attributed to the amount of syllabus covered (the standard error was 2.7).

Confidence in passing UNEB examinations vs school assessments: One would expect students to feel more confident in passing national examinations if they are confident in passing school examinations. This was confirmed by the analysis, with an adjusted R-squared value is 0.7403 (with a standard error of 2.4 and a P-value of $0.04 < 0.05$). The P-value specifically indicates that the independent variable cannot be discarded as a valid determinant. The model may be improved by not just considering school assessments but also adding practicals (two independent variables). This gives an adjusted R-squared value of 0.845 (standard error of 1.879), with positive gradients for both variables reflecting a positive relationship with the dependent variable.

Confidence in passing UNEB examinations vs likability: The strongest factor that affected students' confidence in passing national examinations in agriculture is likability. With an adjusted R-squared value of 0.942 (standard error of 1.147), students were more likely to report being confident with regard to the examination if they liked agriculture and the P-value of 0.0039 suggests that likability cannot be ignored. Finally, students who reported liking the subject and had done some practicals reported being more confident about passing UNEB examinations, with an adjusted R-squared value of 0.974 (standard error of 0.773).

Discussion of Results

This research shows that before and after the lockdown, there was no relationship between the number of practicals done and syllabus coverage. We also note that several students complained (in the comment section of the questionnaires) about the lack of practical time, with most of the catch-up time being dedicated to theory. According to Zengele and Alemayehu (2016) and Shah (2020), hands-on practice helps students to improve retention of knowledge and to deepen understanding of abstract theoretical concepts, besides improving their cognitive abilities as well as independent learning. In addition, Lupupa and Aubriel (2020) and Basheer, Hugerat, Kortam and Hofstein (2017) showed that there was significant improvement in students' test scores when demonstrations were used to teach concepts in chemistry (like oxidation reactions). Furthermore, Meyer, Schmidt, Nozawa and Paneee (2003) note that demonstrations encourage students to be more inquisitive, makes them more active and hence enhancing their learning. This point is supported by Augusto, Castelo-Grande and Estevez (2019), who observe that students' performance in engineering is affected by passive learning and excessive theoretical deductions. They further note that laboratory work enables students to develop a range of skills like analytical skills, teamwork, drawing conclusions and problem formulation, among others. Daluba (2013) notes that students' perception of agricultural science is affected by inadequate teaching approaches, which result in limited interest and poor performance. He suggested that interest and curiosity can be improved by the use of learning activities that are stimulating to the students, demonstrations and generally making classrooms student-centred. Despite the advances in technology and the subsequent changes that have taken place in education, the nature of laboratory and practical work in general is transforming slowly. This is because the technology that can transform face-to-face learning into laboratory exercises that are interactive is "complex and requires a multi-step approach" (Gasparello et al., 2022). Bhute, Inguva, Shah and Brechtelsbauer (2021) and Patterson (2011) argue that it is necessary to transform traditional laboratories to enable remote practical experimentation and learning. Patterson (2011) further urges incorporating multimedia laboratory manuals to help students with preparation for practical work, which makes laboratory tasks as well as report writing easier. He argues that even just making good quality videos of laboratory equipment, instructions and assembly of the experiment help students to contextualise and make learning more meaningful. These studies suggest that when laboratory practical work and demonstrations are well planned, they have the potential to improve students' performance. Our research, however, suggests that students' confidence in passing national examinations cannot be based on practical coverage alone, but on a combination of factors.

Likability of the subjects had a positive relationship with students' confidence for all the subjects before the lockdown (with the exception of agriculture, where there was no relationship at all between likability and confidence in passing examinations), but the results showed that this factor alone could only provide a moderate relationship with performance, except for biology where likability strongly determined students' confidence in national examinations. Of all the four subjects, mathematics had the weakest relationship between likability and confidence in passing examinations. After the lockdown, the strong relationship between likability and national examinations only got stronger for biology, and in mathematics, students tended to be more confident in passing national examinations if they reported liking the subject (likability could not be ignored anymore as was the case before the lockdown). This was the same for agriculture, where confidence was significantly high when practical coverage and likability were combined. Therefore, practical work, when combined with students' liking of a science subject as well as healthy syllabus coverage, can improve confidence

in students, which may then result in improved test scores; and this was clearly demonstrated in the analysis before and after the lockdown.

These results indicate that in order for students to have confidence in their abilities and to ultimately pass examinations, educators need to work on the affective part of their subjects by providing motivation rooted in students' reality, for the different topics in their subjects. It has been noted by the Australian Education Review of 2007 that "science education is too heavily skewed towards the abstract conceptual canon of science, and too often ignores the realities of students' own lives, interests and feelings" (Tytler, 2007). Parents and teachers, therefore, have a challenge to entice students with science and improve likability for the subjects. The other explanation can be derived from Kabunga et al. (2016), who note that students with a poor attitude to science subjects tend to perform poorly and students who are motivated in science tend to perform well in assessments. If students' attitude is poor, they are less likely to be confident in passing the national examination and this, in part, is what our model shows. Therefore, for students to pass science subjects, substantial effort must be made towards improving their attitudes by popularising them (Uganda National Commission for UNESCO, 2017). Michaelis (2017) notes that the process of motivating learners is complex and may involve targeting students' intelligence beliefs as well as their intrinsic motivation (internal desire). Intrinsic motivation may be provided by parents, teachers and the government through the Ministry of Education in a variety of ways, one of which may include alignment of what teachers teach with real life, using examples and textbooks with Ugandan illustrations to provide cultural and geographical contexts, which were determined to be very important in aiding students' understanding (Jimes, Weiss, & Keep, 2013). By doing this, students feel that learning science subjects has meaning in their lives, thus raising their level of motivation and likability.

For subjects like mathematics and chemistry, confidence in school assessments and syllabus coverage, when combined with practice (for mathematics) or likability (for chemistry), provided strong relationships with national examinations. For both subjects, school assessments were an important factor before and after the lockdown, but practical coverage was more important to students of chemistry before the lockdown than syllabus coverage. These suggest that students need continuous assessment more in these subjects, which then is used to check their understanding and improve performance. School assessments are both formative and summative in nature (Sanchez-Luiz et al., 2021), but the ultimate goal is to see that students acquire the learning objectives intended and ultimately pass national examinations, which then ensure their continued journey with STEM subjects and careers. UNEB examinations are summative in nature and do not offer students an opportunity to improve their result. Continuous assessment then takes on the role of formative assessment in that it informs and helps in monitoring the learning process. However, to be effective, teachers are required to give timely feedback to their students, their parents and school administrators (Muskin, 2017), and when given in an informative manner, such results benefit students through enabling them to improve their learning by addressing problems that may have been identified by the teacher. In mathematics and physics, topics tend to be hierarchical in nature, meaning that topics can be arranged in a given order (like a tree) with topics at the root affecting other topics that come after. Basing on this, Sánchez-Ruiz, Moll-López, Moraño-Fernández and Roselló (2021) propose that continuous assessment in mathematics should be based on such organisation and each assessment task be based on one topic and its immediate successor to gauge improvement in the previous topic and its application to the current topic. Not only do school assessments help students, but they are also of great help to teachers as they inform them of areas that may need special attention (what to

repeat, revise or add), as well as giving them a chance to modify their teaching methods (Sanchez-Luiz et al., 2021; Muskin, 2017; Wickramasinghe & Timpson, 2006). Feedback should go beyond a number or grade but should provide adequate details to enable the student to address issues and challenges (Walde, 2016). However, it is argued that continuous assessment can be shallow and promote superficial learning (Sanchez-Luiz et al., 2021). Muskin (2017) argues that continuous assessment should not contain just traditional exercises and problem solving, but also project work to foster the development of higher-order skills, inquisition and interest.

There was a negative correlation between likability of science subjects and practicals. This suggests that even when practicals are carried out, they are mostly done to clarify content from the theory part of the course and not meant to improve students' engagement and likability of the subject. This is in agreement with Ghartley-Ampiah at al.'s (2004) discovery that teachers in Ghana tended to focus on clarification of theory in their practical work and not on attitude. There is a need to incorporate everyday life into the practical component, for this helps students not only visualise their ideas but also generate new ones, with the overall effect of driving up excitement for science subjects. This will ultimately not only improve achievement in national examinations, but also lead to increased retention and higher numbers in STEM fields. Perhaps the best way to ensure an attitude change is to use science to solve societal problems, even at the classroom level (Galvao et al. 2010), thus making it relevant.

Conclusion

We have seen that although practicals and good syllabus coverage are important for students' confidence in passing examinations, likability of the subjects plays a big role in students' passing and progression in the sciences. This result is also supported by Musasia, Ocholla and Sakwa (2016), who recorded students' low interest and lack of motivation and the poor performance in science subjects in secondary schools in Kenya. This research has provided evidence that, indeed, likability and pass rates are related and that in order to boost retention and recruitment rates in STEM, more has to be done to make the subjects likable.

We have also noted that there is no relationship between the number of practicals done and syllabus coverage. This confirms previous claims by several researchers that students are not doing enough practical work, which is critical to the acquisition of scientific skills. A drastic improvement in the availability of standard laboratories and ensuring that teachers conduct timely practicals for the students is recommended.

Other recommendations include the use of technology to aid the learning process (Ouma, 2021; Adams, 2009; Gasparello et al., 2022). It should be noted that students generally like and use technology to stay connected. Over 50% of students involved in this research indicated having a smartphone. Steps should, therefore, be used to incorporate this in the teaching and learning of sciences, for example by running practical demonstrations and streaming them over the internet to students' phones.

Limitations

Data for this research was collected in February 2022. Some of the respondents had just started Senior 5 and, thus, they may not have studied enough to provide a realistic response regarding their future performance in national examinations. They may have used their past experience with the subjects and their past UNEB examination performance to inform future performance. Furthermore, with

UNEB examinations at least 18 months away for students in Senior 3 and 5, these respondents may not have had to seriously ponder their expected UNEB performance until it was presented to them in the questionnaire, and this may have affected some responses.

In future, we intend to implement an intervention plan involving setting up a digital center to enable teachers to provide learning materials that students can access, with a well-stocked laboratory. There is also a need to reconsider teacher education to ensure that teachers have the expertise necessary for successful learning, and to provide support for the already serving teachers, many of whom have gone through traditional methods of teaching and need help and support to transform their teaching to embrace and incorporate digital tools not just in the classroom but in the laboratory, too.

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Overcoming Policy and Practice Fragility and Enhancing Security of Science, Technology and Innovation Educational Achievement for Females in Uganda

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Abstract

The Sustainable Development Goals 2030 (SDG 4 and 5) provide for the attainment of quality education for all, including women. Africa Agenda 2063, Uganda Vision 2040, the Third National Development Plan (NDP III) similarly all provide unequivocal reiterations on the need for the provision of quality inclusive education that will drive national socio-economic transformation. This is particularly envisioned through a robust science, technology, engineering and mathematics (STEM) education that fosters relevant science, technology and innovation (STI) knowledge, skills, values, attitudes and competences to constitute the epicentre of the transformation. Promoting the achievement of women in equal measure to men in STEM and STI is critical to the socio-economic transformation agenda. However, there exist gaps in the policy framework and the implementation of STEM education that undermine STI educational achievement, especially for women. This conceptual paper is aimed at examining the fragility of legal and policy frameworks for STEM/STI education and the strategies for enhancing STI educational achievement for females in the Ugandan context. We argue that strengthening the policy implementation of gender-responsive STEM/STI education is a precursor of socio-economic transformation of nations and the entire world. The paper adopts a semi-systematic literature review methodology to examine legal and policy documents for strengths, flaws and implementation gaps with the aim of recommending strategies for enhancing STEM/STI educational achievement for females in Uganda.

Keywords: *Education; Gender Policy; Science; Technology; Innovation*

Introduction

Science, technology, engineering, mathematics and innovation (STEMI) are vital to achieving internationally agreed development goals (Tizikara et al., 2019) and regarded as not only a precursor to industrial development but also to socio-economic development (Bichi et al., 2019; Gonzalez et al., 2020). STEMI help to develop skills and competences and promote innovation, which are necessary for national growth and development (Gonzalez et al., 2020). Tizikara et al. (2019), however, caution that unless the objectives, worries, circumstances and capacities of women and men are taken into account while creating STEMI policies and carrying out STEMI activities, STEMI cannot successfully assist fair and sustainable development. There are many barriers to success in the STEMI professions, particularly for girls and women, which require consideration. According to Tizikara (2019) and UNESCO (2020), women's and girls' capacity for STEMI participation is egregiously underdeveloped and underutilised. Girls and women are underrepresented in educational, entrepreneurial and employment possibilities, in addition to having less access to information and technology (Bichi et al., 2019; Gonzalez et al., 2020; Namatende-Sakwa & Longman, 2013).

According to rankings of gender equality around the world, Uganda's gender gap decreased from 70% in 1996 to 48% in 2017 (Tizikara, 2019). There was 90 % equality in educational attainment. Women's presence in professional and technical fields climbed from 22% in 2006 to an average of 35% in 2014. According to a 2012 UNDP report, women hold 22% of top management positions in the public sector and make up 33% of the entire workforce. The Uganda National Academy of Sciences honour roll lists 65 Fellows, only nine of whom are women.

There are not many disparities between girls' and boys' views about science in the first years of secondary school, according to studies. However, it is important to remember that there are significant leakages along the education pipeline, particularly for girls. According to Tizikara (2019), just 17% of women were represented in the natural sciences, 23% in engineering and technology, 31% in the medical sciences, 20% in agricultural sciences, and 27% in the social sciences, according to the 2015 UNESCO Science Report. According to the 2016 Women in Global Science and Technology (WISAT) assessment of gender and STI in Uganda, there were 39% females overall, with significant heterogeneity within institutions. These statistics follow several initiatives, among which are gender mainstreaming and affirmative action in higher education access, that aim at increasing the participation of girls/women in STEMI (Ampaire et al., 2021; Nabbuye, 2018).

A research study to track and map the career paths of a cohort of engineers who received their degrees between 2008 and 2012 found that just 15% of female engineers were nationally mobile, considerably fewer women were registered, and 34% of female engineers worked in fields unrelated to engineering. According to the Uganda Bureau of Statistics (UBOS, 2017), the majority of women-owned businesses were concentrated in the trade sector (44%), education, health and social work (49%), as well as lodging and food services (65%), highlighting the strong influence of the patriarchal culture that predominates in Ugandan society and the traditional " male" dominance of industries requiring technical skills.

Gender parity is a factor in the admissions procedures at educational institutions in Uganda. Despite having lower average cut-off scores for admission, female students are still underrepresented in most courses. The universities have set aside quota allocations for female students of at least 27 to 30%. At Busitema University, female enrolment grew by 21% between 2014 and 2018, faster than male enrolment, which rose by 13% (Busitema University, 2018). Although it met the quota requirement, the total male-to-female student ratio remained at 68 to 70% for men and 30 to 32% for women. There were gender inequalities in the enrolment in the various courses, with a significantly lower percentage of women enrolling in engineering and science and education. There were observable differences between courses in the percentage of female students enrolling in postgraduate study, which were also similarly lower. Similarly, women made up only 23.8% of the academic faculty in 2018. Engineering (18%), health sciences (21%) and agriculture (24%) faculties had lower female staff ratios than natural resources and environment (36%) and science and education (9%). The senior echelons were dominated by men. The larger percentage (58%) of female teaching assistants suggests that there is a conscious effort to recruit and guide young ladies into academic careers. The proportion of women in the administrative and support cadres was 35% and 27%, respectively.

In order to assist gender mainstreaming and university development, the Busitema University gender policy places a strong emphasis on gender research, budgeting, quality control and university outreach activities that pool information, skills, experiences and resources from the broader population. Three of the university's initiatives are gender-focused and represent best practices: (i) a minimum quota allocation of 27 to 30 % has been established for female students admitted in all undergraduate courses, and this has been maintained over time across all faculties; (ii) admission to the university is merit-based but with a gender lens, offering females lower cut-off points than males; and (iii) the university allocates funds for conducting gender-sensitive research. This is true for nearly all Ugandan universities.

Women continue to be underrepresented and devalued in STEM education (Nabbuye, 2018; Nakayiwa et al., 2020) and in paid employment, particularly in high potential areas and high-status occupations (Tizikara et al., 2019). This is true despite increased levels of education. Even though there are more girls in education than ever before in many fields, they are notably underrepresented in STEM fields. In all facets of the education value chain and job "pipeline", from interest in majoring in STEM disciplines in post-secondary education to STI professional careers, the representation of women gradually falls behind that of men (World Bank, 2018). To promote the desired gender equity in access to and achievement in STEMI fields at higher education levels and in the labour market in Uganda, this study was carried out to examine and close policy and practice gaps on STEMI education in the Ugandan higher education sector.

Purpose of the Review

The aim of this review was to locate and analyse the literature on the legal and policy frameworks for STEMI in Uganda, identify gaps between policy and practice and make recommendations for bridging policy and practice.

Review Questions

The study attempted to provide answers to three main questions:

(i) What legal and policy frameworks are in place to promote the participation of girls/women in STEMI in Uganda?

(ii) What are the gaps between policy and practice that lead to continuous underrepresentation of women in STEMI?
(iii) How do the legal and policy frameworks for STEM and STI translate into strategies for enhancing participation at national and institutional levels?

Methodology

This paper is based on a semi-systematic review of literature. The literature comprised peer-reviewed journal articles, institutional reports, books and book chapters, and conference proceedings on the topic of gender in STEM and STI. The search strategy used to locate and select the documents for analysis was based on different dimensions of the topic. The search followed a strategy based on keywords related to STEM, STI, gender, gender parity, gender policy, education and higher education. The bulk of documents were located from institutional databases and Google Scholar. The search field comprised titles, abstracts and full documents. Duplicate and inaccessible documents were eliminated. The search moved from screening of titles and abstracts to complete reading of full texts. The decision on selection, inclusion and exclusion of texts identified in the search was guided by the research purpose and questions. A narrative analysis and integration of data were done. Texts were analysed for similarities and differences in relation to the research purpose and questions.

Findings

Legal and policy frameworks of STEM and STI education in Uganda

Uganda is pro-women since it has signed international gender protocols. All levels of central and municipal government encourage gender-responsive legislation, policy and administration. In the 1960s, the Uganda Women's Union and the Uganda Council of Women were established in order for women to exert their political authority in Uganda. Upon entering power in 1986, the NRM government immediately committed to removing discrimination against women in official policy and practice and to encouraging women's participation in all facets of national development. The institution and promulgation of "quota" laws and policies contributed to an increase in female participation in political institutions, a rise in the enrolment of girl children in school and a gradual transformation of the legislative agenda as a large number of laws pertaining directly or indirectly to gender equality were introduced and promulgated. Intense deliberations and debates involving female politicians and activists resulted in the establishment of, among others, a ministry responsible for gender issues (1987), the National Women's Council (1993) and the Equal Opportunities Commission (2007).

Numerous laws, policies and initiatives have been enacted and implemented to enhance women's social, educational and health circumstances, economic autonomy, civic engagement and empowerment, either directly or indirectly. Local frameworks such as the 1995 Constitution, Vision 2040, NDP II, the National Women's Council Act (1993), the Equal Opportunities Commission Act (2007), the National Youth Policy (2001) and the 2016 NRM Manifesto uphold gender equality. The National Gender Policy (2007) supports gender mainstreaming in all government ministries, departments and agencies (MDAs) and local governments and mandates quotas for women in executive posts. The Gender in Education Sector Policy (2009), the National Strategy for Girls' Education (2000), the Social Development Sector Strategic Investment Plan and institutional gender policies aim to eradicate all types of gender inequality in education, social services and the workplace.

The United National Council on Science and Technology (UNCST) is responsible for national coordination of activities, while the Ministry of Science and Technology (MoSTI) provides political and policy leadership on all issues pertaining to the implementation of STI (MoSTI, 2017; United Nations [UN], 2020). Besides, the ministries of Agriculture, Animal Industry and Fisheries (MAAIF), Education and Sports (MoES), Finance, Planning and Economic Development (MoFPED), Gender, Labour and Social Development (MoGLSD), Tourism, Trade and Industry (MoTTI) and Health (MoH) have a direct impact on the management and operation of the STI ecosystem.

The National Development Programmes (NDP) II and III, and Vision 2040 granted STI sector status. In order to promote the implementation of the National Science, Technology and Innovation Policy enacted in 2009, a five-year National STI Plan was subsequently formulated in 2012. The primary purpose of the National STI Policy was to develop and strengthen national capabilities for the generation, transmission and utilisation of scientific knowledge, skills and technologies necessary for achieving Uganda's development goals. The STI strategy prioritises research and development as key factors of Uganda's technical and social development. In addition to increasing the number, qualifications and productivity of research personnel, the strategy aims to increase Uganda's Gross Expenditure on Research and Development (GERD) from 0.5% of GDP to the African Union-recommended 1%.

Uganda also subscribes to the Science, Technology and Innovation Strategy for Africa (STISA), which the African Heads of State adopted in 2014 to accelerate Africa's transition to an innovation-led, knowledge-based economy by enhancing STI preparedness in terms of infrastructure, professional and technical competence, and entrepreneurial capacity. By virtue of its membership in the East African Community (EAC), Uganda's STI system became a constituent member of the East African Science and Technology Commission (EASTECO) established in 2007 (and became operational in 2015) to enhance cooperation in the development of regional science and technology policies; to encourage joint mobilisation, use, management and development of resources, both material and human, for the development of science and technology in the EAC remit; and to provide a forum for the exchange of information and experiences among member states. The East African Regional Science, Technology and Innovation Policy will ensure that universities become centres of excellence for investments in education, technical competencies, and training, especially in science technology and education.

Gaps between Policy and Practice

Global trends in gender disparity in STI and STEM

Knowledge gaps exist even in advanced knowledge civilisations. Women's participation in the knowledge society is unequal or negligible everywhere, including the US. The number of women in STI is declining in the world's major economies. In most nations, women make up less than 30% of engineers, physicists and computer scientists. Women have less access to land, capital, technology and education, which are needed for the knowledge society and linked professions (Namatende-Sakwa & Longman, 2013). Economic position, government and political roles, access to economic, productive and technological resources, and a supportive policy environment affect female parity in STI. Health care, childcare, fair pay and gender mainstreaming benefit women.

Sub-Saharan Africa has 30% of the world's ICT professionals who are women. These facts indicate STI gender disparity. Global surveys compare male and female mathematicians, computer

scientists and natural sciences. Initiative of Women in Science and Engineering (IWISE), a global four-year project on women in STEM, found underrepresentation of women and that science policy and women's promotion, recruitment and retention lacked balance. Over 50% of undergraduate, graduate and post-graduate students were men, although female faculty presence increased with seniority (averaging 42% of assistant professors, 34.2% of associate professors and 23.4% of full professors). One-third of tenured faculty recruits were women. Retaining and advancing women into roles with more authority, resources and high-impact research seems to be the biggest challenge.

IWISE data showed no substantial or systematic changes in STEM techniques. There were emerging but limited gender-equity programs. Women's presence on strategic, decision-making committees was crucial because it is critical to have varied viewpoints and because participation builds leadership abilities and visibility. Women's underrepresentation hurts the entire field. While the gender gap in STEM studies and STI professions is well-documented globally, fresh data shows a substantial disadvantage in new and developing industries. Women lack career-advancing chances and resources.

Gaps in policy and practice in Uganda

According to Ssali's (2019) research on gender equality in local and international laws and policies and their implementation, as well as an earlier assessment of gender equality and STI (WISAT/WOUGNET, 2015), Uganda had strong gender-sensitive policies and legislative measures, but implementation issues prevented the country from reaching its intended goals. Women dominate nursing, secretarial and clerical positions in Uganda's public, health and education sectors, according to UNCST (2016) and UNDP (2012). In Uganda's government, men control certain positions and sectors, while women focus on caregiving. Uganda's public administration has not reached the critical mass of 30% women in decision-making positions, and the situation is far worse at the sub-national level. According to the 2011 Ministry of Public Service Gender Mainstreaming Guidelines, the top gender issues in public administration are recruitment, selection and promotions, with gender-insensitive instruction, progress, assignments, gender-inclusive vocabulary, work atmosphere and workplace harassment as leading concerns.

In both the public and private spheres, Ugandan women are viewed as weaker than men (Tizikira, 2019). Personal decisions are more important to women than family decisions. Significant partner impact exists on women's economic decisions, such as whether to work or study. Despite their numbers, girls and women have fewer opportunities to access resources (Namatende-Sakwa & Longman, 2013). Rural women observe and transmit their culture's customs. Lack of social security thwarts the ambitions of many women; many drop out of school and are unable to complete their degrees, diminishing their professional chances. As a result of stereotypes, caring for children, managing the family's finances and maintaining the home are regarded as "women's duties", limiting the identity and social role of women. Women must balance career and domestic duties.

Regional spatial inequality is on the rise. This imbalance is caused by poverty, infrastructure, societal pressures and early childbearing. Over 50% of Ugandan girls are married before the age of eighteen, and young women have a 5% lower literacy rate than young men. Women confront lifelong obstacles to adult literacy education, such as husbands discouraging their wives from enrolling in adult literacy and higher education programmes.

Universal primary education (UPE) ensures equal access to education, particularly for rural and impoverished populations. Enrolment in UPE has increased despite contested implications,

particularly for young women. Girls' enrolment is determined by their age and their mother's education, not by gender bias. Parental education has no effect on males. With UPE in place, the classrooms became overcrowded and the majority of students were average performers. The increased student-teacher ratio means it is more difficult to facilitate and direct learning in large classes. Owing to the poor quality of education, numerous classes contained students of incorrect age due to late enrolment or grade repeat.

The Ministry of Education acknowledged education leakage, particularly for girls, in 2017 (World Bank, 2018). In 2004, one out of every ten elementary school students attended secondary education. Between 2011 and 2015, survival and transition rates for boys and girls declined. Survival rates for boys and girls fell from 32% in 2011 to 30% in 2015, while transition rates dropped from 67% in 2011 to 53% in 2015. From 2000 to 2016, 66.8 million boys and 66.1 million girls attended primary school, while 16% of male elementary school graduates and 14% of female graduates attended high school.

According to the National Strategy for Girls' Education, hurdles to gender equality in secondary education include location, menstruation, family obligations and school attitudes. In 2007, the introduction of universal secondary education (USE) increased the number of girls enrolled in public secondary schools by 49%. Owing to tuition and the idea that secondary education is more advantageous for boys, the plan encouraged girls from low-income homes to attend secondary school. Since the implementation of the USE started, teachers' working conditions have deteriorated and students' motivation has decreased. Girls' parents view education as the government's primary responsibility, despite the policy's intention to involve multiple parties.

As with measures aiding women in STI occupations, there is an imbalance in the recruitment, advancement and retention of women in high positions. Despite affirmative action, men have an advantage due to the absence of participation targets or quotas. Administration structures and service delivery have not been prioritised despite the emphasis on gender equality. Without flexible employment options and equivalent procedures, women are disadvantaged by their caregiving responsibilities and "double load" (Tizikara, 2019).

Women are disadvantaged relative to males due to a lack of awareness of policy effects on women and men and the perception that men are breadwinners. According to studies, gender roles at home are more stable than in public settings. Changing the gender division of labour and sharing domestic responsibilities are important to gender equality in the workplace (World Bank, 2018). For working women to successfully navigate the home and the job, they need an education in life skills. Despite laws and dismissals, young female workers and students are frequently subjected to sexual harassment, including during recruitment and in return for grades/tests.

Despite equal the existence of opportunity regulations and legislation, certain difficulties remain unsolved, such as the societal construction of gender in conventionally masculine positions assumed by women, isolation and sexual harassment, and generational variations in the perception of women in STEM/STI. Some are neglected or irrelevant (such as recruitment and promotion practices for part-time, hourly paid, pregnant women and older staff). The nation invests in STEMI education for youth, but does not develop mid-career practitioners or value, employ and retain veterans. Others, especially those that recruit from a small, elite pool of professionals, lack clear protocols for recruitment, staff development and advancement.

The Employment Act mandates equal compensation for equal work (2006). Anecdotal research suggests that working women do not always want to exert extra effort to create the performance skills necessary for promotion because "they are married to men who earn more; and since the

husbands provide for everything, they do not need to stress for promotion." This kind of thinking is problematic. First, this does not apply to single women or widows. The gender wage gap should also be investigated. If they assume that all households have a male wage earner, travel and housing allowances can lead to unequal financial gains.

Entry, retention and completion by gender in STEM education in Uganda

Facilitating factors

Since the Beijing World Conference on Women in 1995 and the Johannesburg World Summit on Sustainable Development in 2002, the global community has attempted to involve women and girls in research (Tizikara, 2019). In 1975, March 8 became International Women's Day. It has become a rallying cry for the rights and involvement of women, particularly in the political and economic spheres. At its 81st plenary session in December 2015, the United Nations proclaimed February 11 as International Day of Women and Girls in Science to encourage women and girls' equitable access to and participation in science, gender equality and empowerment.

According to Tizikara (2019), affirmative action in education policy has decreased gender gaps in education but not in employment. In general, women benefit from the national STI research system. These research methodologies involve women in the selection, creation and application of technology through consultation and collaboration. Diverse assistance programmes encourage girls to enrol in STEM courses and women to pursue and remain in STI fields. Numerous networks and organisations help girls and women who pursue professions in STEM and STI. The integration of gender problems and comprehension of gender usage and access patterns are crucial for STI prevention among women.

National gender-sensitive investments and interventions in STI have centred on establishing the institutional structures required for effective and sustainable STI policy implementation, and approaches that facilitate the application of a gender lens, ensuring that both women and men benefit; establishing and maintaining effective partnerships and consultations with stakeholders in the study and application of science; and utilising tools.

Hindering factors

There are gender disparities in health, social standing, the economy, and access to resources. This restricts the access of women and girls to technology, knowledge, education, scientific research, employment, decision-making and the private sector (Namatende-Sakwa & Longman, 2013). From 2002 to 2014, Uganda's GERD averaged 0.31% of GDP, rising from 0.17% in 2010 to 0.48% in 2010. According to the ministries of Education and Finance, the proportion of the national budget allocated to education increased from 12% in 1991 to 21% between 1997 and 2000. In FY 2019/20, it was 10%, down from 18% in 2001–2006. Investments in tertiary/university education decreased from 11% in 1997 to 8% in 2002, averaged 11% from 2003 to 2012, increased to 20% in 2016, and then again to 13% in 2019.

Tizikara asserts that Ugandan women are innovators, entrepreneurs, guardians of STI sub-systems, researchers and practitioners (2019). Owing to "gender leakages", women are underrepresented in education, work and creativity. Multiple studies demonstrate girls' difficulties in STEM fields. Inappropriate education for girls, security issues, a pedagogy that favours boys and unequal access to technical and vocational education are culprits. The absence of female STEM role models, popular culture depictions, and cultural attitudes, female discomfort in male-dominated

classes, lack of encouragement and support for females in STEM topics, and harsh and inhospitable academic systems are highlighted.

Self-perception and confidence are reasons why women are underrepresented in STEM fields. Some women (and their parents/guardians) believe that girls cannot flourish in maths and science at the same level as boys. Long-standing gender stereotypes and cultural biases contribute to the underrepresentation of women in STEM fields (Frosina & Mwaura, 2016). Some locations dictate women's occupational choices (and Study fields).

The underrepresentation of women in STI careers has multiple causes. These include domestic and career responsibilities (conflicts between career and family, inflexible hours); (ii) the length of preparation necessary; (iii) gender bias (perception of women in these fields as unfeminine and/or lack of confidence in their ability to perform the work); and (iv) a lack of social encouragement to pursue careers in these fields. Many jobs dominated by women are being lost to automation. Other causes include underrepresentation of women in STEM disciplines, undeveloped infrastructure to enable women to enter or re-enter the workforce, such as child- and elder-care services, and the fact that unpaid labour is predominantly the duty of women are potential causes.

Strategies for enhancing female participation in STI education in Uganda

Increasing the number of women in science is not simple. Involving women requires access to resources, gender empowerment and a robust educational system. Increasing formal (postgraduate) and informal (workplace) education, as well as training programmes for women and girls, can support lifelong education. It is crucial to include mentorship tools, prominent role models, toolkits and funding for "Girls in STEM" programmes that encourage STI careers for women, apprenticeships, workplace training and retraining when they return to the field. In training and programmes for women, balancing job and household responsibilities, discrimination and harassment should be addressed.

A number of government and institutional programmes attempt to increase female involvement in STI and STEM. There are numerous gender-specific regulations that support STI and STEM. Tizikara (2019) examines government-adopted research and development (R&D) programmes. The 2007–2013 Millennium Science Initiative (MSI), the current Research and Innovation Fund (RIF) and a number of presidential initiatives all seek to fund senior and graduate researchers engaged in highly tailored and influential research and innovation projects that drive the nation's development agenda. The establishment of centres of excellence was intended to improve institutional training, research and innovation. These include innovation centres and cluster efforts that promote young inventors and entrepreneurs. The Ministry of Finance, Planning and Economic Development's (MOFPED) budget framework document for 2018/2019–2022/2023 reviews 2016/2017 policy achievements and forecasts increased STI output (MoFPED, 2018). The projects and activities are updated in the second-half budget monitoring report for 2019/2020 prepared by MoFPED (2020).

Girls in Science and the National Plan for Girls' Education (2000) address gender disparities in education and STEM. In 1991, the government awarded 1.5 additional points to girls entering college in an effort to increase the proportion of women in higher education (NCHE, 2013). In 2013, the Higher Education Students' Loan Scheme was established to aid science students. The scheme encourages gender equality.

At the institutional level, policies and affirmative actions have been implemented to address gender disparities in education, particularly in STEM fields. Tizikara (2019) details the initiatives of

Bustema University, Makerere University and Mbarara University of Science and Technology (MUST) to eliminate gender disparity in STEM. According to reports, Busitema University has developed a gender policy to promote gender mainstreaming. The admissions policy of the university promotes more women to enrol in STEM courses, and 27–30% of entrance positions are reserved for women. Women have lower admission requirements than men. These initiatives eliminate gender disparities in STEM. In high schools, outreach programmes promote gender-sensitive career counselling. The higher education access certificate (HEAC) programme at Busitema University is designed to connect students to science courses. In 2019, Makerere University established a STEM affirmative action policy, according to the study by which 40% of STEM occupations were reserved for women. MUST joined the "STEM for Girls" initiative of Google. The project was intended to increase female engagement in STEM fields in secondary schools. This would be accomplished through workshops for science teachers and visits to schools.

UN Women and UNESCO collaborate with international partners to address the gender gap in STEM and digital technologies. Interventions include strengthening women in the workplace, marketplace and society, as well as targeting injustices early in the education system by increasing girls' interest in STEM subjects, combatting stereotypes in the curriculum, and enhancing access to female mentors. In addition, they collect data disaggregated by gender to promote gender equality in national STI policies, strategies, plans and regulations, and they provide fellowships, networking opportunities and mentoring for female academics. L'Oréal-UNESCO for Women in Science has recognised female scientists since 1998. The initiative has recognised, promoted and supported over 3,000 women in science. The foundation has promoted girls' interest in science to encourage the pursuit of vocations.

The world can benefit from the Fourth Industrial Revolution by using the creativity and ingenuity of all women and girls in science and by investing in inclusive STEM education, R&D and STI ecosystems. Applying a gender perspective to STI for development, supporting gender-appropriate teaching approaches and materials, and providing grants and other non-monetary incentives can overcome many of these problems. Technology may not eliminate gender inequality, but it certainly helps. To enable the private sector, IT industry and government to innovate wisely and responsibly, the national STI system should institute prudent measures. Rarely do STI policies and decisions include women's needs and concerns. Due to their economic and cultural significance, women are potent change agents. Using a gendered approach to science and technology for development must account for their interests and concerns. Women in science can contribute to society through shaping science and technology, research and innovation (R&D). In three of the four countries reporting science and technology education intake ratios, males benefit more than females. To promote women's innovation, access to education, capital and markets technology must be improved. Entrepreneurial women need aid.

To improve STI for women in agriculture, it is essential to integrate gender considerations and to comprehend gender usage and access trends (Namatende-Sakwa & Longman, 2013). There are gender-biased/focused STI initiatives for validating, protecting and improving local knowledge, innovations and skills in food production, energy, water, nutrition, transport and natural resource management, and numerous technologies have been developed and disseminated, particularly those aimed at reducing women's workload and improving their health, addressing gender-differentiated needs and problems, or providing women with economic opportunities.

Modern, clean, affordable, sustainable (green and renewable) energy (domestic biogas, solar home systems) and clean and efficient household cooking solutions and home designs (cook stoves that use a wider variety of biomass as fuel, chimneys/hoods and adequate ventilation in kitchens) have improved health, food security and time savings. Most family caregiving decisions are made by women. Artificial Intelligence (AI) and routine labour automation can save healthcare expenses by minimising bureaucratic procedures. Online platforms for communicating and obtaining sensitive information enhance the health care autonomy of women. Apps that track the menstrual cycle could reduce absences from class and work.

Discussion

The Government of Uganda recognises the importance of STI and gender equality in the process of national development. The potential for industrialisation and job creation in Uganda is great if the manufacturing, agricultural and agro-processing sectors are revitalised. In this context, having access to highly qualified domestic technical personnel is important for success. Consequently, the government has made significant strides in creating an enabling policy environment for enhancing the participation of girls and women in STEM and STI and to take advantage of the social and economic growth benefits resulting from gender-sensitive STI initiatives. Several sector policies, strategies and pieces of legislation, as well as institutional frameworks, articulate gender equality and STEM education and employment issues. However, as is the case in many nations, national policies and strategies appear to have neglected the need to address some of the most significant obstacles to girls and women's pursuit of higher education. Diaz-Chavez and Mungo (2021) posit that such obstacles manifest in low enrolment of girls in STEM. This finding is in agreement with that by Hafkin (2016), who reasons that sector-specific policies, programmes and projects may not always reflect constitutional and legislative commitments to gender equality and inclusion. Watera (2018) adds that the majority of policies, plans and strategies focus on resource, infrastructure and finance difficulties rather than the key barriers to girls' enrolment in STEM fields.

For instance, policies have not targeted the groups of people who socialise children into different societal and cultural roles. Children's choices, accomplishments and goals are influenced by their parents, families and community members. Girls' attitudes towards fields relating to science and technology are impacted by this socialisation. This is in agreement with UNESCO's (2020) and Watera's (2020) argument that gender bias and stereotypes in families, communities and the education system have prevented girls and women from participating in STI and STEM. The government has also made accommodations for students' financing in the form of a higher education loan programme to among other objectives promote the participation of girls in STEM courses in higher education. However, owing to the high competition, many needy female students are locked out of the scheme. Thus the policies have resulted in a number of improvements, but the representation of girls and women in STI and STEM is still marked by pronounced disparities, as evidenced by the low enrolment of women in STEM courses at universities.

Similarly, the proportion of women and girls working in STI- and STEM-related professions has remained low, a sign that there is a mismatch between policy and practice. Despite the impressive techniques used by the government and colleges, few women select careers in STEM fields. Because there are not enough girls participating in STEM at lower educational levels to create a pool for university entrance, STEM enrolment is still low. According to Watera (2018), this is due to social factors that reinforce preconceptions within the educational system, as well as teacher and curriculum

gender bias that results in gender-insensitive pedagogy. Public gender equality programmes or policies that encourage girls' participation in STEM fields typically do not address these problems. If teacher development programmes included strategies for eradicating gender prejudice from schools and classrooms and retraining instructors in gender-sensitive pedagogy, they might be successful. Women are also underrepresented in research and academic professions in Uganda and globally owing to barriers to networking, juggling work and family obligations, and career planning. Government has established an innovation fund to support scientific and innovative research but, like the loan scheme, this project is very competitive and many female researchers are thus excluded.

Conclusion

Economists argue that the world of work is changing rapidly, and this change is driven by STEM skills and knowledge. STEM subjects and skills are thus becoming increasingly essential in the competitive world today. Moreover, STEM skills play a key role in fostering development in a country. They are thus essential in accelerating Uganda's development aspirations to a middle income country and the achievement of the SDGs. Gender equality in science and technology is a central ingredient in facilitating these trends. We acknowledge that Uganda has done much in creating an enabling policy environment for the improvement of the participation of Girls and women in STI and STEM. The policy and institutional provisions have brought in some improvements but pronounced disparities can still be found in the representation of girls and women in STI and STEM. This could be attributed to the fact that the underrepresentation of girls and women in science is deeply rooted in unfavourable constructs that legal and policy frameworks have not addressed. Systemic, social and cultural barriers to girls and women's participation in science disciplines and careers still exist. Addressing these barriers would improve entry and retention of girls and women in science, enabling them to favourably compete and excel in their careers.

Therefore, in order to ensure that sustainable development does not overlook the potential talents and contributions of women and girls, STI and STEM policies need to be thoroughly examined. Local, national and regional organisations, as well as innovation networks, must take more initiatives. The socio-economic and environmental transformation envisioned in UN Agenda 2030 and Uganda Vision 2040 is made possible by a more comprehensive, socially inclusive approach to STI and STEM. In order to reduce gender discrepancies in participation in STI and STEM in Uganda, seemingly favourable policies need to change. It is important to revisit the legal and policy frameworks for gaps and effect changes where necessary. Such changes are likely to have significant impacts on young people and women in the workforce. Otherwise, in spite of the robust gender, STEM and STI legal and policy frameworks in place, girls and women may still remain excluded from lucrative and fulfilling job options.

Recommendations

The following recommendations derive from the conclusion. It is critical for Uganda to coordinate policies and initiatives that support STEM education at all levels in order to assist the growth of higher order skills required for modernising or reviving the nation's manufacturing sectors. If women are to benefit from the critically important 21st century abilities, many of which are obtained from education and training in STEM-related disciplines, the government needs to expedite cooperative efforts to promote the participation of girls and women in STEM-related subjects. The STI ecosystem's diverse stakeholders must work together to address girls' and women's underrepresentation in

science disciplines and professions. To effect change, the public and business sectors, academic institutions, communities, teachers, parents and girls and young women themselves must work together. Evidence gathered from local actors must guide policy.

The ministries responsible for education, STI and gender need to establish joint programmes to encourage women's participation in order to increase the number of women who work in STI/STEM. More girls and women are likely to be drawn to STI- and STEM-related fields and careers if there is a combined scholarship fund for awarding bright female students and young female researchers engaged in cutting-edge research and other outstanding scientific achievements.

It is necessary for curriculum developers to address the prejudices and preconceptions produced within the curriculum and learning materials, including textbooks; and this should also be addressed by policy. STEM policy must cover interventions that target parents, too, in order to foster a good attitude towards STEM.

Higher education institutes and universities need to implement strict mentoring programmes for young female researchers in order to assist them in overcoming the challenges of an academic career and other obstacles to their advancement. Girls and young women also require powerful female role models to pique their interest in STEM fields. Role models, encouragement and support for young women to start out and advance in STEM-related occupations would be provided by policy programmes that can bring together women and men from the STI industry. Listening to the success stories of female scientists in academia, business, the corporate world and other STEM-related professions would be more beneficial for girls and women.

A concerted effort to enhance the proportion of female scientific educators at the secondary school level and who are university professors should also be taken into consideration when formulating policy. The advancement of women in science and technology should be documented and shared, suggests Tizikara (2019). For this, a three-pronged approach is suggested: (a) at the national level, the establishment of a journal to publish research and innovation by female scientists, and hosting a symposium to disseminate such works and innovations; (b) universities should include gender equality weeks in their annual curricula so that female scientists can share their experiences and progress; and (c) secondary schools should hold a girls' science day to promote interest in STEM-related subjects. These events are beneficial for increasing the visibility of women in STEM fields, addressing issues of inequity, and advancing gender equality. They provide opportunities to spread knowledge regarding institutional and national gender equality policies and programmes, many of which stakeholders are unaware of.

It is crucial to make conscious efforts to advance gender and women studies, as well as gender equality research and education. In this regard, Makerere, the oldest public university in the nation, has made significant gains, and gender concerns are now included in certain colleges' curricula as themes and courses. If this technique is left to individual institutions, it will not yield much gain. The Ministry of Education and NCHE need to work together in a coordinated effort.

Declaration of Conflict of Interest

We declare no conflict of interest

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Availability of data and material for data transparency

All data generated or analysed during this study is included in this published article.

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How Internationalised Is Your Curriculum? University Graduate Students Speak Out

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Abstract

Internationalisation of the curriculum has created changes to the traditional curriculum but little attention in research has been paid to the student perspective on these changes, and how they experience them. This paper aims to fill the gap by reporting on the findings of graduate students' perceptions of the internationalisation of the curriculum at Makerere University in Uganda. This study adopted a sequential explanatory survey study in which we collected both quantitative and qualitative data from a sample of 180 graduate students. The findings showed that the majority of the respondents agreed that their curricula had an international dimension. This was commonly seen by graduate students in terms of international academic staff, international students, travel abroad programmes for students, courses with an international focus, comparative studies and focus on ICTs. The participants voiced concerns about logistical constraints and the universality of knowledge. These findings reinforced the earlier research that proposed that the above aspects are critical in the IoC and can act as benchmarks to guide further work in the direction of the university's internationalisation agenda. No earlier works had similar results, at least in the context of the Global South where this study was conducted. Further studies need to involve other actors in higher education to explore more fully the notion of IoC to explain better the basis of students' perceptions and experiences of IoC reported in this study.

Keywords: *Higher education; Internationalisation of the curriculum; Graduate students*

Introduction

Today, a high-quality education must prepare students to live and work in a world characterised by growing multiculturalism and diminishing borders. Higher education institutions (HEIs) across the world are rising to this challenge by embracing internationalisation in the provision of

education. One of the strategies they have frequently used is infusing their curricula with global and international themes and perspectives (Gao, 2015; Green, 2005; Knight, 2004; 2008) – a notion that is widely known as the internationalisation of the curriculum (IoC). This paper, from a broader study that established the effect of internationalisation of higher education (IoHE) on the global citizenship (GC) of graduate students at Makerere University in Uganda, presents and discusses graduate students' perspectives on the extent to which their curricula are internationalised. Although the students belong to different disciplinary backgrounds, one of the key expectations of their university education is to churn out global citizens as highlighted in the Makerere University mission, which is "to provide innovative teaching, learning, research and services responsive to national and global needs" (Makerere University, 2008, p. 12). Despite declaring an internationalised curriculum as highlighted in the university mission above, the extent to which the university has embraced internationalisation within its graduate programmes curricula, at least from the students' perspective, is yet to be ascertained.

Historically, universities have been international, especially in the universality and borderless nature of their knowledge, staff and students (De Wit, Hunter, Howard, & Egron-Polak, 2015). However, the international activities of universities have generally been growing with time – particularly in the last two or three decades of the 20th century (Altbach & Knight, 2007; Jones & De Wit, 2012). At the same time, in the late last century, the International Association of Universities (IAU) advised that higher education must integrate an international and intercultural dimension into its teaching, research and service functions (IAU, 1998). Within this global context, the notion of IoC has emerged, and has now become prominent in the literature on internationalisation, with such activities as teaching and learning processes, extra-curricular activities, liaison with local cultural and ethnic groups, and research and scholarly activities (De Wit, 2011; Knight, 2004, 2012).

Whereas many publications offer literature on what IoC is or could be, little is known about the extent to which the curricula are internationalised, especially from the perspective of the students who receive them. The available literature on IoHE curricula has focused primarily on investigating the strategic directions (see, e.g., Bisaso and Nakamanya, 2021), outcomes (Ayebare, 2019; Zimitat, 2005) such as the skills, knowledge, attitudes, values of democracy, equality, sustainability and justice needed to make positive, ethical contributions as citizens and professionals to their global, national and local communities (Leask, 2011; Clifford, 2005). However, the mechanisms by which universities achieve their preparation of students for the sought-after international relevance and employment are not well elaborated in the literature, especially from the viewpoint of students. This could be because studies of the IoHE curriculum have been scarce (Barnett & Coate, 2005; Leask & Bridge, 2013), leading institutions to often rely on anecdotal evidence rather than actual data in the planning of and for IoC. It must not be forgotten that the real proof of the success of IoC lies in the students' experience of the curriculum. But just how are students experiencing the phenomena of IoC? The purpose of the study was to bring about the hitherto almost silent students' voices into the debate on IoC. The study sought to answer the question: How do the students experience the internationalisation of the curriculum? To answer this question, we explored the graduate students' experience with the curriculum at Makerere University in Uganda.

IoC has become a common strategic goal of the broader internationalisation strategy in modern higher education (HE) (Kirk, Newstead, Gann, & Raunsaville, 2018) albeit with varying interpretations. To some scholars, it remains a contested term that is elusive and unsatisfactory (Turner & Robson, 2007) that demonstrates a nuanced and context-specific construct. However, in

her typology of international curricula, Van der Wende (1996) suggests a variety of approaches that include curricula in which the traditional or original subject area is broadened by an internationally comparative approach and programmes, which prepare students for international professions, and can lead to joint degrees from different countries. While this typology reassures students of global competence, it does not provide specific ways in which it can be designed or implemented.

In 2004, Knight defined internationalisation as "the process of integrating an international, intercultural or global dimension into the purpose, functions or delivery of post-secondary education" (p. 11), a definition that is silent on the actual content of an internationalised curriculum. Against this deficiency, Clifford and Joseph (2005) argue that IoC is about students developing global perspectives and cross-cultural capability to be able to perform, professionally and socially, in a multicultural environment. This definition emphasises the outcome of IoC but does not answer the question of what an internationalised curriculum entails. Later in 2009, Leask postulated that IoC is the incorporation of an international and intercultural dimension into the content of the curriculum as well as the teaching and learning arrangements and support services of a programme of study. According to Leask, therefore, such a curriculum "will engage students with internationally informed research, cultural and linguistic diversity, and it will purposefully develop their international and inter-cultural perspectives as global professionals and citizens" (p.209). This understanding of IoC captures the nature and outcome of IoC and is adapted to guide this study. Hence, IoC in this study was characterised by the incorporation of an international perspective into the content of what must be taught and learnt (e.g. international languages, international courses and comparative studies) as well as conducting joint teaching with an international university, conducting compulsory international internships, as well as the involvement of international staff and students.

The Context

Ideally, an internationalised university curriculum is expected to contain methods and strategies that expose students to the world and its realities. However, in reality, this may not be true. Makerere University in Uganda may not be an exception. Yet, in the early 1990s, the university embarked on a deliberate internationalisation strategy that included, among others, the attraction of international staff and students, the integration of the international perspective into teaching and learning, the carrying out of collaborative research as well as the award of joint degrees. This move was well-received by many members of the university community, mainly because of the advantages that came with internationalisation, such as its expanded international visibility and access to the university, improved research funding prospects, networking and participation in international community activities – all of which would improve the visibility and global ranking of the university. These strategies were aimed at producing graduates who are exposed to global realities to enhance their relevance in the multicultural and interconnected world. However, despite these strategic decisions, little is known about the extent to which internationalisation – especially as regards the curricula – has taken root at the university. This is largely due to the lack of empirical studies in this area, leading to no evidence to demonstrate this; thus, the genesis of this study, which explored the nature of curriculum internationalisation at Makerere University.

Literature Review

There is little doubt about the need and benefits of internationalising the curriculum. No wonder, Turner and Robson (2008) advocate the incorporation of an international dimension into each degree

programme to prepare all students for life in an increasingly interdependent world (Schuerhalz-Lehr, 2007). This universities do by ensuring that students graduate with the skills, knowledge, attitudes, values of democracy, equality, sustainability and justice needed to make positive and ethical contributions as citizens and professionals to their global, national and local communities (Leask, 2011; Clifford, 2005) by expanding the horizons of students beyond local, national and parochial concerns (Leask, 2011).

Lunn (2008) and the Organisation for Economic Co-operation and Development (OECD) (2004) have advanced that IoC helps students cope in a world that is multicultural, environmentally vulnerable and interdependent, and is a vehicle through which the development of beliefs and values can be instilled into the life and learning of students, ensuring that they graduate ready and willing to make a positive contribution in the world. Leask and Bridge (2013) add that such learning prepares students to be ethical and responsible citizens and human beings in this globalised world. In fact, to Hudzik (2011), the core mission of higher education is the production of graduates who can live, work and contribute as productive citizens in an increasingly fluid and borderless global context.

There seems to be no one correct way of internationalising the curriculum (Ryan, 2012). Diverse descriptions in the literature and on institutional websites show what an internationalised curriculum might look like in theory and practice. According to Knight (2012) and Gao (2015), this concerns the inclusion in the curriculum of components of foreign language studies, international studies, internationally comparative perspectives, cross-cultural training, joint study programmes, and student and staff mobility. These, according to Knight, emphasise student learning outcomes which include international and intercultural knowledge, skills and values. These have given what IoC is and what it could contain.

Within an internationalised curriculum, international students are valuable contributors with their diverse cultural perspectives and experiences, and have the potential to transform the campus and the classroom into a vibrant microcosm of the world (Leask, 2009). Such an experience could ensure that both home and international students develop the skills and knowledge required to work in a global setting in their different professions (Leask, 2009). However, studies (see, e.g., Leask, 2009; Ayebare & Onen, 2021) indicate that the diversity of students is an untapped resource, with most universities struggling with ways to improve the quality and quantity of contact between home and international students. Other studies (see, e.g., Green, 2005; Harrison & Peacock, 2013; Killick, 2012) have pointed to cultural differences such as languages, bias and threats to the academic success and group identity of the different students in the university as critical factors for proximity to one another while at campus.

Other scholars have given a range of guidelines and frameworks on how best to go about the process of IoC (see, e.g., Leask & Bridge, 2013). Leask and Bridge's framework for internationalising the curriculum shows that disciplines play a central role in shaping academics' knowledge (ontologies, epistemologies and methodologies), assessment practices and the structure of the programme of study, yet disciplinary discourses and ways of working are nested within various contextual 'layers', including the global, regional, national and institutional.

In 1998, Josef Mestenhauser (cited in Leask, 2009) argued that to internationalise the curriculum, there was a need to challenge both the nature of the curriculum and the paradigms on which it is based. According to him, IoC had been too focused on isolated projects and programmes designed to train a few students as future international affairs specialists, completely ignoring the fact that all graduates will work in a global setting as engineers, accountants, doctors and so on. Other

analysts (see, e.g., Van der Wende, 2000) have called for the need to ensure that an internationalised curriculum develops the skills and knowledge required to prepare all students to live and work in a global setting.

More recent literature on internationalisation has been moving away from providing broad definitions and suggesting practical ways of putting IoC into practice (Leask & Carroll, 2011; Jones, 2010). Emphasis has now been focused on how important it is for institutions to engage the people who are in charge of designing and delivering the curriculum – the academic staff. Their role in the institution-wide process of internationalisation is vital (Dunne, 2011). Sanderson has referred to them as "a catalyst in assisting their institutions and their students to realize their internationalisation goals" (Sanderson, 2011, p. 662). This understanding that places academic staff at the centre of IoC is shared by other scholars who believe that their involvement in internationalisation directly impacts the teaching, research and service missions of HEIs (Childress, 2010) because they are the top researchers and the drivers of international consciousness, creating an international mindset in an institution (Altbach & Yudkevich, 2017; Page, 2003) and controlling the curriculum (Edwards, 2007) from which students are expected to acquire international awareness. However, faculty can also be the main obstacle to internationalisation (De Wit, 2013; Hudzik, 2011; Friesen, 2012). This understanding is, however, based on a deep appreciation of the need to empower academics to make necessary personal and collective changes for themselves within their disciplinary contexts but not the benefits to students. This framework from the planner's point of view prompted scholars like Green (2005) to ask: "What about the demand side?" (p. vii) – referring to the receivers of the curriculum, the students. This scenario has also compelled us to investigate the IoC from the perspective of the receivers, that is, the graduate students in the case of this study.

More empirical studies have established how different players have perceived IoC in their different contexts. Zimitat (2005) conducted a survey study at an Australian university exploring students' perception of the internationalisation of the undergraduate curriculum. IoC was conceptualised in terms of content, teaching methods, perceptions of teachers and campus environment, a self-assessment of personal skills development, and the extent to which their degree programme had prepared them for working in an international environment. Zimitat found that on all items that described IoC, a significant proportion of students did not perceive or experience international dimensions and a slightly larger proportion of students were not sure of the international dimensions of their experiences at university. It could be, as observed by Nagarajan and McAllister (2015 p.89), that "a major challenge to the internationalization of curricula in any discipline is the lack of clarity about what internationalization means".

In their study that investigated empowerment and ownership in the IoHE curriculum in which they interviewed 24 course instructors across 15 subject areas, Kirk, Newstead and Gann (2018) found that there was a lack of inclusion of international aspects and content in the curriculum documentation. They also found that there was a general lack of understanding of IoC by instructors. This finding, which places the academic staff at the centre of the curriculum internationalisation process, re-echoes the view of Davies (2006) that, constrained by overwhelming workloads (the consequence of massification coupled with dwindling funding), academics have time only for teaching. This could probably suggest that the lack of inclusion of international aspects in the curriculum is due to the instructors' obliviousness (Leask, 2011), i.e. they may often not be aware of how such a curriculum can be designed or implemented owing to lack of the skills required to add a meaningful international dimension to their courses.

However, a study conducted at Glasgow Caledonian University, Scotland by McKinnon (2012) to understand the perceptions of IoC by academic staff identified students' attitudes towards IoC, which was described as "parochial" by the academics, as a barrier to IoC. According to this study, students often preferred to remain in their comfort zones, restricted their own choices, and did not always give themselves the chance to fulfil their full potential because of the fear of leaving their home countries. Green (2005), in a survey study investigating internationalisation in US higher education from a student perspective, confirmed this claim with a finding that revealed generally low levels of interest and participation of students in on-campus international activities outside the classroom and other places. This might mean that students who are not interested in international activities may as well not have a 'feel' of what internationalisation is or could be. In this regard, Leask (2013) categorised the conditions that foster or limit IoC as cultural, institutional and personal 'blockers' and 'enablers'. Leask, however, maintains that by employing methods to identify blockers, these can be turned into 'enablers'. However, Leask also cautions that the solution is not simple since it is 'stubbornly difficult' because it involves personal values, beliefs and priorities by various players within and outside an institution.

In summary, several studies have attempted to provide a range of frameworks and ways in which educational institutions can have their curricula internationalised. However, most of these studies are from the side of the planners, leaving out the receivers of the curriculum. Even those studies in which the students' perspectives were incorporated have emerged from the Global North (see, e.g., Green, 2005; Zimitat, 2005) and were majorly surveys that could not possibly capture individual students' unique experiences with IoC. Within these contradictions, this study attempts to bridge this gap by bringing some students' voices from Makerere University in Uganda to the ongoing conversation on IoC in practice.

Methodology

We believe that reality is not absolute unity, but rather there is an external reality independent of the mind as well as that logged in the mind. Building on this pragmatism philosophy, we adopted a mixed-methods approach employing a sequential explanatory research design. This enabled us to gain a deeper insight into the issue of IoC, especially from the perspective of students. Based on Biglan's (1973) classification of disciplinary fields, we stratified colleges into four disciplinary strata – namely, hard-pure, hard-applied, soft-pure and soft-applied – and two department strata, namely life-systems and non-life departments. A sample of 180 graduate students selected by the use of the stratified random sampling technique was determined a priori, ensuring representation from all disciplinary fields. A unanimous and voluntary partially adapted self-administered questionnaire which had earlier been tested for its validity and reliability was employed to collect data. Curriculum internationalisation was measured using 12 items presented with accompanying alternative response categories on a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. Only graduate students who were in their second year of study completed the questionnaire. The IBM SPSS version 21 was used for data entry, cleaning and analysis with the use of carefully determined descriptive and inferential statistics.

Qualitatively, we selected one participant from each of the eight departments selected from the four colleges that we sampled. As such, eight purposively selected participants took part in this study. Interviews were preceded by a brief explanation of the nature of the study and the ethical concerns (confidentiality, consent and procedure). With their consent, interviews that lasted 40 to 60 minutes

were conducted while being recorded. The participants were given codes based on the college/department disciplinary category and sex; hence, hard-pure, non-life systems male (HPNLSM); hard-pure, life systems male (HPLSM); hard-applied, non-life systems female (HANLSF); hard-applied, life systems male (HALSM); soft-pure, non-life systems female (SPNLSF); and soft-pure, life systems female (SPLSF). Inductively, we analysed the data using the thematic content analysis technique that enabled us to understand the meaning of the complex data through the development of summary codes from the raw data. Based on the similarity of the ideas, codes were merged to form themes. To complement these findings, assorted university documents were reviewed.

Findings

In this paper, the participants are shown by their disciplinary fields. Quantitative data was collected from a sample of 180 graduate students, who responded to most or all question items. These were all graduate students drawn from six of the nine colleges and the School of Law at Makerere University in Uganda.

Demographic characteristics

In terms of sex distribution, male respondents (109 or 60%) dominated the study. This was in tandem with the enrolment data, which showed that there were more male graduate students than female at the university – an inequality that needs to be separately addressed in another study. In terms of disciplinary fields, the majority of the participants were drawn from the soft-applied (59 or 32.8%), followed by those from the hard-applied (49 or 27.2%). These were followed by respondents from the soft-pure (41 or 22.8%) disciplines and then the hard-pure (25 or 17.2%) disciplines. This finding was also in line with the enrolment distribution of graduate students in the different colleges in the university – where more students were enrolled in the humanities and the social science programmes. Regarding the nationality of the study participants, the national students (154 or 85.6%) dominated the sample as compared to the international ones (26 or 14.4%). This was not strange because there are more local students than international ones. Finally, concerning travels abroad, the majority (62.3% or 112) of the study participants had never travelled abroad before enrolling in their current study programmes. This implies that students' prior exposure to international issues was likely to be limited and, therefore, did not influence their perceptions of IoC. On the other hand, of the seven participants, three were males, four were females, five were national and two were international students. The composition of our interviewees was dictated by our small sample size and the limited number of international students enrolled in the selected academic departments.

Summary of descriptive statistics on internationalisation of the curriculum (IoC) The respondents were asked to express their opinions on the 12 items that measured IoC using a five-point Likert scale ranging from 1=Strongly Disagree (SD) to 5=Strongly Agree (SA). The summary of the responses of students regarding IoC is presented in Table 1.

Table 1: Descriptive statistics on internationalisation of the curriculum (IoC)

Questionnaire item on IoC	Mean	Std. dev	Interpretation
I have studied an additional internationally used language.	1.62	0.909	Disagree
My university has a graduate studies language proficiency requirement.	3.83	0.975	Agree
Instruction at my university is done through an internationally used language.	4.54	0.673	Agree
The content covered in my study programme covers global issues.	4.40	0.595	Agree
Some of the compulsory courses I take cover global issues.	4.33	0.616	Agree
The elective courses I take cover global issues.	4.30	0.693	Agree
I have studied a course that requires comparing world systems.	4.10	0.822	Agree
I am pursuing a jointly taught degree programme.	2.10	0.925	Disagree
International internship is a compulsory component of my programme.	1.92	1.01	Disagree
My study programme has equipped me with ICT skills.	4.30	0.652	Agree
Courses have exposed me to knowledge about different parts of the world.	4.30	0.776	Agree
Courses have exposed me to knowledge about different global issues.	4.30	0.622	Agree

Overall mean = 3.66 (Agree)

The results in Table 1 show a favourable rating of IoC by the university graduate students with an overall mean response rate of 3.66, which corresponds to "Agree" on the Likert scale used. The majority of the respondents agreed with all but three items (I have studied an internationally used language during my programme; I am pursuing a degree that is jointly taught with another university outside Uganda; and internship outside Uganda is a compulsory aspect of my study programme) measuring IoC with more or less similar standard deviations. This suggests that the respondents saw internationalisation in some but not all aspects of their curriculum at the university. This could suggest that despite the university's thrust towards internationalisation, IoC has not yet fully taken root.

Student perceptions of IoC by disciplinary field

As earlier explained, in line with Biglan's (1973) classification of disciplines, we stratified colleges into strata of disciplinary fields because of the belief that differences between the disciplines could influence the nature of IoC in each field. The four disciplinary categories that participated in this study were hard-pure, hard-applied, soft-pure and soft-applied. To establish if student perception of IoC varied between the respondents in different disciplinary fields, we conducted an ANOVA test, whose results are presented in Table 2.

Table 2: Students' ANOVA results on IoC by disciplinary field

Disciplinary category	Sample	Sample mean	Sample std. dev	Fisher's statistic (F)	Sig.
Hard-pure	31	3.569	0.3192	1.309	0.273
Hard-applied	49	3.722	0.3720		
Soft-pure	41	3.686	0.3285		
Soft-applied	59	3.644	0.3633		

Collectively, the respondents across disciplinary fields had similar perceptions of IoC, with more or less similar standard deviation and mean scores. Compared with other disciplinary fields, the hard-applied respondents rated IoC slightly higher than the soft- and hard-pure disciplines. However, the computed Fisher's statistic of 1.309, with the significance (p) level of 0.273 ($p = 0.273 > 0.05$), showed no significant difference in the perception of IoC between respondents from different disciplinary fields. This suggests that the respondents' perception of the curriculum was never influenced by the disciplinary category to which they subscribed.

Students' individual experiences with IoC

During the interviews, the study participants expressed their different individual opinions about IoC at their university. But most importantly, all the seven interviewees concurred that their curricula had aspects that contributed to their international learning and understanding. Specifically, the results on IoC produced five main sub-themes, namely: international academic staff; international students; travel abroad programmes; courses with an international focus; comparative studies; and focus on ICTs. Below, I present the different subthemes.

International academic staff. The importance of having academic staff from all over the world who can share first-hand international information was recognised by the participants in this study as an important aspect of IoC. Although no participant shared that they had had permanent international staff, evidence indicated that the university received visiting lecturers, guest speakers and online lecturers who addressed students about different aspects of global concerns. According to SPLSF, this was made possible by the partnerships between the university departments and universities abroad. HALSM had received guest lecturers from China and Japan, as well as attended a Skype lecture conducted by a lecturer in a South African university; while SPLSF had received professors from the University of Torino. Similarly, SALSF had received a facilitator (guest speaker) and two or three professors from universities abroad whom she described to be different from those who originated from the country by saying that "… those who have been here would provide us all the information, but those who have been from abroad want you to take a step and do your research from international journals" (SALSF).

Although the statistics on the status of international staff at Makerere University were not readily available, their recruitment as an internationalisation strategy is strongly upheld by the university documents (see, e.g., Makerere University, 2008, 2009). For example, the Human Resources Manual of Makerere University provides for the hiring of expatriate academic staff as well as according them privileged status. It postulates that "*non-citizens shall not be subjected to the age limits for appointment into university service, the ability for the applicant to serve shall be a major assessment factor*" (Makerere University, 2009, p. 16). This means that within an internationalised curriculum, international academic staff are valuable contributors to diverse cultural perspectives and experiences. They have

the potential to transform the campus and the classroom into a vibrant microcosm of the world. Such an experience could ensure that students – both home and international – develop the skills and knowledge required to work in a global setting in their chosen profession.

Presence of international students. From the interviews, it was discovered that the university had several international students – but that their numbers were dwindling. Study participants HALSM, HANLSF, SALSF, SPLSF and SPNLSF all reported that they had lived, studied or interacted with international students who mostly came from Rwanda, Kenya, Nigeria, Democratic Republic of Congo, Sudan, Japan and Norway, among others. This information cohered with the documentary evidence and that from the international office, showing that Makerere University supports internationalisation through the admission of international students.

Travel abroad programmes. In this study, travel abroad emerged as an apparent element of IoC. The study participants revealed that mobility programmes for students were common in some – but not all – the departments at the university studied. Some participants reported having travelled abroad as part of their study programme, yet others reported that their friends had travelled. For example, one participant revealed that "there is a project on which our students visit the outside university and their students also come to our university" (SPLSF). According to another participant (HANLSF), in projects that are funded by SIDA "students are allowed to participate in international mobility programmes in different countries like Kenya and Gabon". Although student travel abroad was attested to in only a few departments, it remains an important aspect of IoC that exposes students to the global realities that cannot be experienced at home.

There were, however, some challenges associated with travel abroad. HANLSF noted that although, sometimes, there were opportunities for students to participate in foreign activities, participation depended on the individual student's ability to provide logistics, a constraint that had earlier been recognised by Itaaga et al. in their 2013 study of internationalisation and regionalisation of higher education in Uganda. These constraints meant the majority of the students at the studied university might not be taking part in foreign activities, hence missing the international exposure that they desired for them to graduate as global professionals.

Courses with an international focus. This was another theme that emerged from the interviews. Almost all the participants reported having studied a course or several courses that focused on international issues and concerns. Some of the courses were about different regions of the world, others were international in nature, yet others were international in content – dealing with issues of international nature and concern. Concerning this finding, participant HPNLSM revealed that he had so far covered 12 courses which all had a focus on global perspectives. In a similar vein, all the 12 courses which SALSF had covered were perceived to have an international focus. SPNLSF, who had studied a course on international relations during her programme, observed:

> We look at how world countries interact…you know it's like geopolitics. Interaction is in terms of politics, economics, policies and cultural relations and when you are reporting, you need to be conscious of these factors that can cause clashes between countries and hence jeopardise world peace. (SPNLSF)

Another participant (HALSM) echoed a similar sentiment. He said:

> I would say, in my programme, international issues on both the courses and content have been included. For example, in most of our courses, we examine different social contexts, different societies and their interactions, and different issues in society, e.g. AIDS, and their impact on human life…

In line with Brandenburg and Federkiel's views (2007), these are clear manifestations of internationality – a deliberate intervention by the various departments at the university to produce globally relevant graduates.

Although there was a general agreement among participants with regard to the international focus of courses, the epistemological concerns and questions about the concept of universality of knowledge in some disciplines were often expressed by participants. In this understanding, those, especially in the NLS departments (HANLSF, SPNLSF and HPNLSM), viewed their programmes as already international by their nature based on the universal theories, concepts and scientific principles they covered. These maintained that some programmes and courses have theories and principles that are not particular to any one part of the country, region, continent or world, but that are applied universally. This understanding is clearly manifested in the views of HANLSF:

> The field I am in is global. All the programmes that we do have been introduced in other countries and they have an international focus… It means that what we cover applies in Uganda, South Africa, the UK and all over the world… If I am processing an image and all over the world they process images, it means the knowledge I have can be applied anywhere in the world…What I need is to keep updated with the innovations or developments in the discipline.

Another participant further expounded:

> The content we study cuts across and it is the same irrespective of the country…when you go to Tanzania, the US or South Africa, it is the same … there is no way it is differentiating between journalism here and that of Sudan, Ethiopia or Korea because we are learning the same theories, concepts … (SPNLSF)

This understanding of the international focus of courses as an aspect of IoC points to the fact that students view their curriculum as internationalised if the courses and/or content go beyond their country. However, it would also suggest that whereas some disciplines intentionally integrate the international aspects into their curriculum, others may need not internationalise the curricula, since they are already viewed as international by nature.

Comparative studies. Comparative studies have generally been accepted as an important component of IoC. They involve comparing various aspects of different countries or using internationally recognised standards. As HALSM revealed, "In some courses, we consider the international standards, especially for the exports, and we compare them with our standards, then we realise that we are still far behind." As far as comparisons are concerned, SPLSF explained that they discussed the global, e.g. China and the US, and compared their systems. SPLSF further revealed that

> …in the course of medical sociology, we looked at aspects of health in more and less developed countries, and then we realised that in less developed countries, there are epidemic diseases which are no longer experienced in countries that are already developed.

SANLSM had also done a course whose content was comparative, and SALSF had done a course that required comparing the economic policies of different countries and macroeconomics, which is essentially international by nature because it looks at the world-level analysis of economic systems. These voices point to the fact that the curricula to which the participants had been exposed enabled them to compare different world issues. When they made comparisons, they got to know what was beyond ……. their countries and how developments in other countries could inform planning in their own countries. In turn, the participants were helped to acquire a broadened perspective of issues. This could help them to develop awareness of various global issues.

Focus on ICTs. The findings indicated that ICT was an important component of IoC. Participant HANLSF observed:

> I think ICT is another important component of my programme. First of all, most courses focus on ICT. Secondly, most of our interactions are online, e.g. curriculum, courseworks, results … but as graduate students, we are taught how to surf the internet for information, send emails etc. (HANLSF)

Even though IoC was manifested and acknowledged by most participants, a look through the programme structures, at least for HALSM, SPLSF and SALSF, did not show any clear documentation and concrete inclusion of internationalisation. Rather, IoC was mentioned in passing or in a flaccid way, suggesting that IoC has not yet fully taken root.

Discussion

In this study, Biglan's (1973) idea of disciplinary fields was initially used to attempt to categorise disciplines in the search for possible distinctive discourses about internationalising the curriculum (IoC) at Makerere University. While the concept of disciplinary fields with their associated epistemologies and beliefs is still relevant, in this study, variations were seen only as far as the international focus of courses was concerned. Otherwise, there appeared no major variation between the views of participants in the different disciplinary fields with regard to IoC. This finding coheres with those of Jacob (2009) and Bauer, Marton, Askling and Marton (1999), who affirm that within higher education, the conditions for stable disciplinary cultures and identities are transforming and that it is more difficult to conceive of academics sustaining bounded spaces of action.

The finding that the respondents judged the curriculum to be internationalised supports that of the earlier researchers (see, e.g., Zimitat, 2005) in which nearly half of all students agreed that their courses and their experiences on campus had an international dimension. Nonetheless, regardless of the noted internationalisation of the curriculum direction at Makerere University, this study found that international languages, joint teaching and international internships (see Table 1), proposed by scholars such as Gao (2015) and Knight (2004, 2008) as important elements of IoC, were not manifested at Makerere University. This could suggest that despite the current thrust towards internationalision of the curriculum, higher education institutions have understood and embraced internationalisation differently, perhaps owing to their different rationales, stakeholders, providers and contexts, which have led to different activities and approaches.

Essentially, a section of participants recognised international academic staff as being vital in the processes of internationalisation of the curriculum. This finding of attraction of and support for international staff as an aspect of curriculum internationalisation agrees with that of Clifford (2005), in which students recognised that staff from overseas or with immigrant ethnic backgrounds demonstrated experience of different cultures and different value systems. Also, the finding supports Gao's 2015 framework for measuring internationalisation and the argument that the international profile of an academic team constitutes an important resource for internationalisation. It also re-echoes the widely agreed argument that the success of any internationalisation initiative in an education institution hinges on the engagement of the academic staff members (see, e.g., Childress, 2010). This is important because international academic staff represent the world and they are often expected to integrate international experiences and perspectives into their engagement with their students more than the domestic staff who have not travelled to imbue themselves with global knowledge.

This suggests that the important factor determining IoC is academics' attitude towards and how they understand and support the processes of internationalisation.

Generally, the participants concurred that there were several international students at their university and that their presence provided an international and intercultural dimension to the institution. Such a finding tends to agree with the views of Leask (2009) about international students as being valuable contributors to diverse cultural perspectives and experiences, hence transforming the campus and the classroom into a vibrant microcosm of the world.

Largely, a section of participants recognised travel abroad as an aspect of IoC. This finding corroborates those of other studies (e.g. Aktas, Pitts, Richards, & Silova, 2017; Lilley, Barker, & Harris, 2015; Morais & Ogden, 2011; Hanson, 2010) in which students had to travel abroad as part of their curriculum requirements. For instance, Aktas et al. report that travel to another country for service learning, internship and/or research was a common element of curricula that exposed students to the real-world setting. Similarly, in a study done by IAU (2005), outgoing mobility programmes for students were among the top-ranked internationalisation activities among participating institutions. This means that, travel abroad has increasingly gained acceptance among scholars as an important aspect of IoC. Nevertheless, what did stand out in this study was logistical constraints on students' participation in travel abroad programmes – a constraint that had earlier been advanced by scholars (e.g. Itaaga et al., 2013; Lunn, 2008) as a major hindrance to internationalisation in much of the literature highlighting that social-economic factors have constrained internationalisation in some countries.

Generally, the participants expressed the belief that their courses had an international focus, a finding that is in tandem with the views of other scholars on internationalisation (e.g. Green, 2005) that the international dimension of courses was an important aspect of IoC. Like in earlier studies, the international focus of courses in this study was intended to expose students to global and international realities and experiences. Nevertheless, what did stand out in this study was the strong belief by those participants in the non-life system (NLS) departments that their disciplines by nature were already international and that they did not need to internationalise, or that there was nothing more to add as in IoC. This suggests that their courses had universally accepted concepts and principles. Again, such a finding tends to agree with those of researchers like Clifford (2009), where students in some disciplines claimed that theories, principles and concepts of certain disciplines, such as chemistry and mathematics, are the same the world over, a belief that made the academics tend not to internationalise as they could not teach these concepts with their related theories differently in any particular part of the world.

Concerning comparative studies, the participants generally agreed that their curriculum had comparative dimensions of different aspects. Such a finding confirms Knight's (2012) argument that the integration of the comparative perspectives into the teaching and learning process and programme content has become a fundamental part of curriculum internationalisation. According to Knight, these would lead to international and intercultural knowledge, skills and values as student learning outcomes.

Regarding ICTs, the participants generally agreed that to be able to explore world realities, different ICTs needed to be utlised. This finding coheres with the argument by Knight (2008) that due to globalisation, new developments in ICTs which facilitate new HE delivery methods for domestic and cross-border education, especially online and satellite-based forms. The finding also

confirms Haigh's (2014) argument that internationalisation is about exploring and exploiting the opportunities of the connected world and the information age by utilising ICTs.

Conclusion and Recommendations

The purpose of this study was to explain the nature of curriculum internationalisation at Makerere University, Uganda's premier university, from the perspective of graduate students. The study is also the first of its kind to explore graduate students' perceptions of the international dimensions of their curriculum at Makerere University. Although the pragmatic nature of the study cannot fully allow for generalisation, what we can affirm is that there is IoC at Makerere University, especially in the graduate programmes, and that different dimensions of internationalisation of the curriculum could be identified by students. Considering the nature of responses to most questions, graduate students across all disciplinary fields were certain about various international dimensions in their programmes. The findings revealed that IoC is not narrowed down to Gao's (2015) dimensions, but it goes beyond students, academic staff and even the modes of instruction. Therefore, to plan IoC, a university needs not to confine itself to what is taught in class but may need to consider the students – because they receive the curriculum – and the staff – who deliver it. As such, this study adds to the current international research literature on the understanding of IoC in different programmes.

In the light of the findings, we call upon university managers at Makerere and other universities to play a critical role in ensuring that international perspectives such as those brought by international staff, travel abroad programmes for students, courses with an international focus, comparative studies, and focus on ICT are integrated into the curriculum. This would help students not only to acquire knowledge of their local environment, but also of the global world at large. Since the results of this study were largely based on the views and opinions of graduate students, we recommend further examination of the international dimension of the curriculum from the perspective of a broad range of other actors, such as undergraduate students, academics and administrators, for a broader understanding of the phenomenon.

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