Higher Education Financial Sustainability in Ghana: A Study of the Perceived Influential Factors

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Abstract

The quest by public higher educational institutions to increase access is heavily dependent on financial sustainability through sustained income and liquidity. This has necessitated these institutions globally to undertake revenue enhancement measures and cost management initiatives to close budgetary gaps. The study's primary focus is to examine critical management factors that impact on university's financial stability and competitiveness. This correlational survey study sought to establish the depth of the relationship between the following management factors; financing scheme, governance framework, and cost management, accounting information system, and pricing approach, on financial sustainability. The study's outcome established a statistically significant relationship between all of the five factors on one hand and financial sustainability on the other hand. The findings further showed that three of the five factors: governance framework, cost management and pricing approach were significant in predicting a best fit equation for financial sustainability. The study's recommendations should assist policymakers and higher education managers to review policies and legislations on cost and competitive fees structure of public higher education institutions in Ghana.
Key words: Financial Sustainability, Higher Educational Institutions, Financing Scheme, Governance Framework, Pricing and Cost Management, Accounting Information System, Ghana

Introduction

Universities and Colleges in Ghana have witnessed considerable growth in the past forty years ranging from accessibility, enrolment, staffing, improvement in physical infrastructure and Information and Communication Technology (ICT). Despite these achievements, Ghanaian universities are confronted with numerous challenges that threaten their future financial sustainability (Bonin, 2017; Botlhale, 2015; Effah, 2015; Klemencic & Fried, 2015). Some of these challenges as enumerated by Abugre (2018) and Antoninis (2017) include weak revenue diversification, budget deficits and funding constrain, ICT infrastructure deficiencies, quality issues and governance and management structures and systems challenges, equity, inadequate infrastructure and increased access to higher education. Critical among these challenges is the lack of a sustainable financing mechanism which poses a threat to the development of quality university education in the country (Awotwe, Sam & Tackie, 2020).

Many studies in the past have suggested that funding constraints, increased competition, weak systems and processes, and greater regulatory and legislative regimes have prompted Higher Education Institutions (HEIs) to develop and strengthen their innovative capacity in order to remain financially sustainable (Johnstone, 2014; Jongbloed et al., 2015; Toompuu & Põlajeva, 2014). These constraints have largely slowed the expansion drive of most public universities in Ghana (Goode, 2017). Data from the United Nations Education, Scientific and Cultural Organisation (UNESCO), Institute for Statistics (2018) suggest a relatively declining trend in government funding of tertiary institutions in the country. Expenditure on tertiary education as a percentage of total government expenditure and as a percentage of GDP showed a decline from 6.95% in 2012 to 3.83% in 2014 and 1.47% in 2012 to 1,13% in 2014 respectively. Expenditure on tertiary education as a percentage of government expenditure on education also witnessed a decline from 19.42% in 2013 to 18.27% in 2014. Table 1 gives the highlights of the trend from 2011 to 2014 with data from the UNESCO Institute for Statistics (2018).

Table 1: Percentage of Tertiary Education Expenditure trend in Ghana

Details	Academic Years			
	2011	**2012**	**2013**	**2014**
Expenditure on Tertiary as a % on Total government expenditure	6.02	6.95	4.12	3.83
Expenditure on Tertiary as a % of GDP	1.07	1.47	1.18	1.13
Expenditure on Tertiary as a % on government expenditure on education	13.13	18.52	19.42	18.27

Note. GDP=Gross domestic product.

Source: Author's analysis of data from UNESCO), Institute for Statistics (2018)

The interrelationship of these challenges and the lack of the right systems, processes and policies to address them holistically impede growth in the universities in the sub region.

The trend from the UNESCO's Institute for Statistics data suggests a shift to diversify public universities funding sources towards increasing the share of tuition fees, loans to students, and grants for research (Newman & Duwiejua, 2015). Hogan (2015) and Ekpoh and Okpa (2017) rightly articulated certain positive effects of financing diversification in higher education, and in research and development. These benefits according to them include harmonizing consultancy services, hiring and leasing university facilities and lands, establishment of agribusinesses and universities' farms, enhancing sources of university endowment earnings, partnering entrepreneurs to establish Small-to-Medium Scale Enterprises (SMEs), commercializing university sports arenas, and the provision of hotel and hospitality services among others. Barr and McClellan (2018) emphasised the importance of sound economic fundamentals for universities which eventually trigger full economic cost recovery opportunities resulting in the creation of the backbone for less volatile future and sustained financing regime for these institutions, hence less dependent on government subventions.

Secondly, financial information obtained from the 2016 financial statements of three public universities namely, Kwame Nkrumah University of Science and Technology (KNUST), University

for Development Studies (UDS) and University of Ghana (UG), showed a declining trend in relative terms of government funding of tertiary institutions in the country. Government's subvention to these public universities as a as a percentage of their total income, fees related income, operational expenditure, showed a decline from 46% in 2015 to 45% in 2016, 129% in 2015 to 128% in 2016 and 49% in 2015 to 48% in 2016 respectively. The ratio of government's subventions to income and cash surpluses of the three public universities revealed a gradual and steady improved earnings and liquidity cover. On the other hand, government's subventions as a percentage of the funding gap of the three universities increased from 98% in 2015 to 106% in 2016. Table 2 gives the detail overview of the trend between 2015 to 2016. The analysis generally suggests that the Ghana government's subventions to public universities have consistently witnessed steady increases in absolute terms but has seen a proportional decrease in relation to income sources and operational expenditures (Kwame Nkrumah University of Science & Technology (KNUST), 2016; University for Development Studies (UDS), 2016; University of Ghana (UG), 2016). Table 2 gives an overview of the funding sources of three public universities in Ghana.

Table 2: Financial Analysis of three Public Universities in Ghana

Details	2015	2016
Government's subvention as a % on total income	46	45
Government's subvention as a % on fees related income	129	128
Government's subvention as a % on total operating expenditure	49	48
Ratio of government's subvention to income surplus/(deficit) (times)	7.56	5.63
Ratio of government's subvention to cash surplus/(deficit) (times)	1.21	1.36
Government subventions as a % on funding gap	98	106

Source: Author's analysis of data from Audited Financial Statements for the 2016 financial year ending 31st December, 2016 of the three public universities.

This thus meant that a sustained regime of funding will very much be for government and public universities to work gradually

towards the full economic cost recovery (Marginson, 2018). Recent financing reforms being proposed for the tertiary institutions in Ghana seeks to deepen equitable allocation of government funding grants and financial performance of public universities. Newman and Duwiejua (2015) enumerated the proposed HEIs financing reforms to include base grants; institutional factor grants; innovation grants; performance funding grants and research grants, with emphasis on the student as the unit cost of production. The rationale as stated by Awotwe et al. (2020) for initiating the poposed reforms are categorized into five thematic areas, namely: (1) student enrolment expansion and institutional diversification; (2) fiscal pressure arising from increased student enrolment with associated increased funding requirements; (3) dominant market orientation and the quest for non-governmental revenue; (4) demand for greater enhanced accountability; and (5) demand for greater quality and efficiency. These recent developments are signals for public universities in Ghana to begin examining their governance, financial and management systems practices to achieve efficiency and full cost recovery so as to mitigate future financial risk and remain competitive.

Evidently, the future survival of universities globally and in Ghana depends largely on sustainable financial resources to meet the widening funding gap. Atuahene (2015) rightly pointed out that the government of Ghana remains the major funding body of public universities in Ghana. As stated by Jaafar, Jizat, Ismail and Yusof (2017) and Teferra (2013), government's subvention to public universities in Ghana declined from 61.34% to 56.54% between 1999 and 2000 leading to under recovery of cost and accumulation of financial deficits. Data obtained from Ghana's 2015 education sector performance report suggest that the proportion of tertiary education expenditure as a percentage of Ghana's GDP declined by about 0.47% between 2011 and 2014. Clearly, it is becoming increasingly impossible for the government of Ghana to continue funding public universities thus the need for these universities to consider other internal financing mechanism to effectively contain the cost.

Thus, improving access and quality of higher education requires that adequate financial resources are available to these institutions and are managed and applied in the most efficient manner. As such, financially sustainable HEIs have the capacity to fulfil current financial obligations without compromising their ability to meet future financial

commitments. Ntim, Soobaroyen and Broad (2017) alleged that the primary challenge for managers of HEIs is their ability to secure financial and academic sustainability at a time when government funding was gradually becoming highly competitive and challenging. Hence, there is the need for HEIs to be creative and innovative in developing programmes that will enhance the current financial condition to propel their financial sustainability. Eleftherakis (2021) revealed that six educational institutions in the Southern Asia-Pacific Division could not be self-supporting without appropriations. His findings suggested that leadership, insurance coverage, long-term investment, financial performance, generation of income, and the sustainable growth rate, were the areas that receive minimal attention from these institutions. De Lima, Soares, de Lima, Veras, de Andrade and Guerra (2020) suggested that HEIs should focus attention on governance, management and full cost recovery systems with particular reference to their impact on HEIs financial viability. Afriyie (2015) arguably settled on the following five management factors for assessing how well HEIs are financially sustainable, strategy for direction, sustainability by recovering all costs, generation of income by using networking and public relations, investment that maintains the appropriate level of productive capacity, and managing risk appropriately to avoid potential problems.

The current changing and competitive environment of the higher education landscape calls for the need to test new governance and management factors in this study, which has sparsely been considered in previous studies. The essence of this study therefore was to find new ways to improve financial sustainability and to identify the important drivers that enhance financial viability of HEIs. The study thus extends the governance and management systems factors already investigated to include: HEIs governance frameworks, financing mechanism, cost management approaches, robustness of accounting information systems, and the pricing mechanism in assessing the wellness of Ghanaian public HEIs' financial sustainability. Hence, analysis done in this study sought to establish how these governance and management systems impact on Ghanaian public HEIs on their financial sustainability. The study adopted a quantitative study approach with data collected from seven public universities in Ghana to test the hypotheses; there is a significant relationship between the five factors and Ghanaian public HEIs financial sustainability.

Purpose of the Study

The primary objective of the study was to examine the impact of the management factors on the overall financial sustainability of Ghanaian public HEIs. The specific objectives were to,

1. Measure the relationship between financing, governance framework, cost management, pricing and accounting information systems, and Ghanaian public HEIs financial sustainability,
2. Examine the strength of the relationship between financing, governance framework, cost management, pricing and accounting information systems, and Ghanaian public HEIs financial sustainability,
3. A predictive model for financial sustainability based on the strength of the factors for Ghanaian public HEIs.

Research Questions and Hypotheses

The study focused on the following three key research questions and related hypotheses: (a) what is the relationship between financing scheme, governance framework, cost management, accounting information systems and pricing approach, and Ghanaian public HEIs financial sustainability? and (b) what is the relative combined effect of the factors contribution in achieving best fit equation model for Ghanaian public HEIs financial sustainability?

The related Hypotheses are: (H_0): there is no significant relationship between the factors and Ghanaian public HEIs financial sustainability, and (H_1): there is a significant relationship between the factors and Ghanaian public HEIs financial sustainability

Review of Relevant Literature

Contributing Factors and Financial Sustainability

In carrying out this study, the five most relevant contributing factors identified from the literature may well assist in unveiling appropriate ways of improving the financial sustainability of HEIs in Ghana. The review of the relevant literature below relating to the factors of this study have sought to emphasise their importance to HEIs financial sustainability.

While there is no agreement on the one best financing scheme for higher education, Botlhale (2015) enumerated some higher education financing mechanisms that have been tried in recent times to include Public-Private-Partnership (PPP), Non-Traditional Finance,

Education for all Fast Track Initiative, Education Tax Credits, Global Education Bond, Diaspora Education Bonds, and Education Voucher. Hillman et al. (2014) rightly stated that public universities and colleges have principally been financed from government and tuition reserves with supplementary funding from the State and students' financial aid. The wide range of literature available focuses on three key financing models namely, 1) endowment funding (Nguyen & Mogaji, 2022), 2) cost sharing practices (Liu, Chen, Wang & Wang, 2020), and 3) students loans and grants financing model (Montalto, Phillips, McDaniel & Baker, 2019).

Governance comprises the structure and processes of decision-making, the establishment of policies to guide the work of the institutions, and the constitutional forms and processes through which universities govern their affairs (Hladchenko et al., 2017; Kwiek, 2015; Shattock, 2013). Higher education system of governance is an essential ingredient in ensuring higher education financial sustainability. HEIs with loose oversight may give rise to low quality education with minimal investment return to students, parents and guardians, the general public and the overall economic development of the country (Erkkilä & Piironen, 2014). The intense demand for elaborate accountability from government, students, parents, guardians and partners of higher education has become more pronounced as HEIs continue to source for funding from these stakeholders (Sam, 2016).

HEIs cost management systems are critical ingredients in ensuring funding sustainability. Estermann and Claeys-Kulik (2013) posit that tertiary institutions must be able to identify and better understand the cost of all their activities and projects. Unlike Ghana, there has been considerable effort by HEIs in the USA and Europe to develop a harmonised costing framework that promote greater degree of transparency and fairness in determining institutional cost build-up (Kostic, Jovanovic & Juric, 2019). The impact and implications of an effective cost management system is the recovery of full economic cost (Darren & Lang, 2017) relating to academic activities. Increased deficits, insufficient resources, increased competition, low students' and parents' satisfaction rate and the likely government policy review are compelling factors for public HEIs in Ghana to implement effective cost management systems (Baum, Ma, Bell, & Elliott, 2014; Dragija & Lutilsky, 2016).

The pricing policy of public universities is pivotal to the financial sustainability and growth of these institutions (Sinclair, Erb, & Braxton, 2016). The three potential pricing options available to public universities are: cost-based pricing, demand (competitor) based pricing and value-based pricing (Amir, Auzair, Maelah, & Ahmad, 2016; Barr, 2015). There is persistent worrying absence of pricing guidelines to serve as a benchmark for public universities in Ghana in pricing their academic activities. Effective pricing of academic activities propels growth and financial sustainability.

The novelties of accounting information system positively affect the efficiency (Akgün & Kiliç, 2013) of higher education management. The emerging software applications for accounting information processing seeks to provide tertiary institutions many opportunities to simplify task and enhance service delivery (Savilla, 2017). A good number of HEIs in Ghana are still using legacy AIS that appears to be costly and has minimal capacity to process today's HEIs information requirement. AIS ensures effective management of cost centres, cost measurement and influences quality managerial decision in providing timely relevant reports (Moghadam, Jorge, & Pirzade, 2017) for effective financial planning.

Many of the studies reviewed have clearly acknowledged the relevance of the individual contributing factors' influence on HEIs financial sustainability with minimal focus on the combined effect of these contributing factors (Amir et al., 2016; Barr, 2015; Moghadam et al., 2017; Rowlands, 2017; Shah, 2015). This thus points to an obvious research gap in the literature, of which this study intends to address by assessing the relative strength of the relationship of these factors and their combined effect on financial sustainability.

Ghana's public universities's financial performance.

African countries in the sub-Saharan sub-region including Ghana are confronted with escalating higher education costs, funding needs and limited available government revenue (Johnstone, 2014). Consequently, governments are gradually shifting the higher education cost burden to students and parents as a means of dealing with the ever widening funding gap (Masaiti, Mwelwa, & Mwale, 2016). Collins (2014a) stated that the most effective and sustainable revenue stream that can support universities' mission is students' tuition fees. The degree and effectiveness of factors such as higher education funding

policy, governance and regulation, the costing method, the accounting information system and the pricing mechanism as noted by Erins and Erina (2017), Lucianelli and Citro (2017) and Upping and Oliver (2016) to a large extent influence how public universities in Ghana accurately measure cost per student leading to full economic cost recovery as they strive to achieve financial sustainability. An assessment of Ghana's higher educational cost sharing policy reveals a number of policy shortcomings notable among them are stagnant educational expenditure, inefficiency in the higher education system with little impact on quality (Nourani, Singh, & Singh, 2015) and financial sustainability (Newman & Duwiejua, 2015).

Funding of higher education in Ghana has evolved over the years. As stated by the National Council for Tertiary Education (NCTE (2012), sustainable financing of tertiary education: building Ghana's future, higher education was fully funded by government between 1948 to the 1970s, and in the 1980s partial funding by way of academic facilities and residential user fees were introduced owing to a barrage of challenges faced by public higher education at the time. The government of Ghana's direct funding of public tertiary institutions has in recent times witnessed general decline in relative terms. Government funding focus is gradually shifting towards infrastructure provision while systematically reducing funding for recurrent expenditure (Awotwe et al, 2020; Newman & Duwiejua, 2015).

Methodology

Research Design

The study adopted quantitative research design to assess the relationship between the dependent and independent variables. Various studies on higher education financial sustainability (Bhayat, 2015; Cernostana, 2017; Chatama, 2014; Sazonov et al., 2015) have long-established the relevance of the quantitative approach and the relative importance of the five independent constructs (financing scheme, governance framework, cost management, accounting information systems and pricing) influence on the dependent construct (financial sustainability). The study further considered quantitative technique as the more preferred due to the possible generalization of the study outcome (Pandey & Pandey, 2021).

Population and Sample Strategy

The target population for this research is the vice chancellors or their deputies, the registrars or their deputies, and subject experts in the finance and internal audit departments and the quality assurance officers of the seven major public universities established on or before the year 2005. The study focused on 85 out of a population of 220 individuals with managerial responsibilities such as vice chancellors, pro vice chancellors, registrars, deputy registrars, finance directors, deputy finance directors, internal auditors, deputy internal auditors, management accountants, budget officers, accounting systems analyst or systems accountants, and quality assurance officers. The population selection is very much similar to Afriyie's (2015) study of higher education financial sustainability. The study employed judgemental sampling technique in the selection of respondents for this study. The selection criteria considered respondents' managerial responsibilities and roles, and the level of experience in their respective institutions. The judgemental sampling technique follows similar approaches by Oanda (2013) on his study of alternative higher education financing in Kenya. Fifty-three (53) valid responses were received out of the estimated sample size of 85 derived from the population of 220, yielding a response rate of 62.35%. The final sample size of 85 was well above the minimum sample size of 30 for parametric statistical analysis.

Research Instrument and Ethical Considerations

The study employed a self-designed validated survey instrument in the collection of the discrete survey data through emails from experts mainly from the vice chancellors or their deputies, finance, internal audit and registry departments of the sampled public universities, due to their level of expertise of the study focus. To validate the study instrument, ten subject area experts from the finance departments of three non-participating tertiary institutions reviewed the research instrument in order to identify deficiencies in the instrument wording, syntax, construct, and content validation. The modified instrument based on the suggestions received was further piloted among 10 subject area experts from the NCTE and NAB. Minor corrections mostly related to instrument wording and syntax errors were carried out in the instruments based on their feedback thus validating the instrument before administering. The researcher conducted a test-retest

reliability by undertaking a pilot study among 10 respondents from the sample over a 7-day period. The reliability test results produced a coefficient of $r = .723$, which was well within acceptable limits and consistency (Creswell & Creswell, 2017).

The data collection and analysis were based on a web-based survey instrument in which respondents provided answers to all the items on a 5-point Likert-type scale (strongly disagree, disagree, not sure, agree, strongly agree). The researcher had prior telephone conversations with respondents and emails were subsequently despatched which included an electronic link respondent were to double click to access the web-based survey instrument for this research. According to Schoenherr, Ellram, & Tate (2015), this approach simplified the survey administration and made the efficient collecting of the data faster than the use of mailing, telephone or physically administering the questionnaire.

The research data obtained through emails was subjected to statistical analysis using correlation and multiple regression analysis to establish the relative importance of the factors to higher education financial sustainability. The study settled on these factors for further validation of their level of influence using multiple regression analysis due to earlier emphasis by previous studies of these factors importance to financial sustainability (Amir, Auzair, Maelah & Ahmad, 2016; Erins & Erina, 2017; Marovah, 2015; Moghadam, Jorge & Pirzade, 2017).

The study sought adequate permissions from respondents and the sampled institutions. The researcher obtained informed consent from the study research sites and participants through official correspondences. All responses were treated confidential and the research participants were adequately assured of complete anonymity.

Results and Discussions
Demographic Statistics

The demographics of the study were in two categories namely participants and institutional demographics. The participants' demographics included their institutions, current job position, participants' age group, gender, participants' academic or professional qualifications, and their relevant professional experience. The participating institutional demographics comprised the institutions students' enrolment and accreditation status. The summary of the

demographics is presented in a tabular format as detailed below in Table 3.

The distribution of job positions of respondents was skewed towards the functional and middle level management. The highest responses ($n = 20$) were received from the functional level management representing 37.73%. The lowest responses were participants within the executive level management ($n = 14$) representing 26.42% of responses. A good number of the respondents were within the age bracket of 41 to 50 years ($n = 23$) representing 43.40% mainly due to the level of expertise required of participants. The breakdown of respondents' gender was mainly skewed towards males. Forty-four (44) of the respondents were males whiles 9 were females. The level of academic or professional qualifications of the respondents is an ample testimony of the qualification level required of the executive management positions. Majority of the respondents ($n = 33$) representing 62.26% of respondents had a combination of undergraduate, masters and professional level qualifications, 13 (24.53%) had both undergraduate and masters level qualifications while 6 participants (11.32%) had undergraduate, masters and PhD/Doctorate qualifications. One participant (1.87%) had master's degree and other qualifications. The breakdown of the level of professional experience in the demographics aligned well with the management level expertise required of respondents. Majority of the respondents ($n = 32$) representing 60.38% had 11 or more years of relevant professional experience. Three (3) (5.66%) had between 6 to 10 years of relevant experience while 13 and five (5) had either 5 years or below and over 20 years of professional experience respectively (see table 3 below).

Table 3: Demographic Information of Participants

Demographics	Participating Institutions							N
	GIMPA	KNUST	UDS	UCC	UEW	UG	UPSA	
Job Positions								
Executive Level Management	3	4	2	1	1		3	14
Functional Level Management	2	4	3	3	4	2	2	20
Middle Level Management	3	3	4	3	3	2	1	19
Age Group								
31-40 Years	4	2	1	2	2	1		12
41-50 Years	2	4	6	3	3	1	4	23
51-60 Years	2	5	1	2	2	2	1	15
Over 60 Years			1				1	2
Under 30 Years					1			1
Gender								
Female	3	3	1		1	1		9
Male	5	8	8	7	7	3	6	44
Academic/Professional Qualifications								
Degree & Masters	3	1	3	1	3	0	2	13
Degree, Masters & Professional Qualifications	4	7	5	5	4	4	4	33
Degree, Masters & PhD/Doctorate	1	2	2				1	6
Degree, Masters & Other qualifications	1							1
Professional Experience								
11-20 Years	3	10	7	2	3	2	5	32
1-5 Years	1				2			3
6-10 Years	4		1	4	2	2		13
Over 20 Years		1	1	1	1		1	5

Source: Author's analysis from research field data

The demographics of the participating institutions were made up of students' population and institutional accreditation status. The population of students in the seven participating tertiary institutions constituted close to 50% of the total population of tertiary students in Ghana. The University of Education, Winneba had the highest number of undergraduate students' population of 56,612 (32.96%) whiles the Kwame Nkrumah University of Science and Technology had the highest postgraduate students' population of 5,806 (28.53%). GIMPA had the lowest students' population of 5,109 and 2,612 undergraduate and postgraduate students respectively but recorded the highest (2,554)

number of students studying diploma/certificate programmes. The University of Ghana had the lowest number of diploma/certificate students of 200. Table 4 gives summary position of the institutional students' statistics.

Table 4: 2017/2018 Students Population of Participating Institutions

Participating Institutions	Students Enrolment			
	Diploma/Certificate Programmes	Undergraduate Programmes	Postgraduate Programmes	Total Population
Ghana Institute of Management & Public Administration	2,554	5,109	2,251	9,944
Kwame Nkrumah University of Science & Tech	2,443	35,508	5,806	43,757
University for Development Studies	2,049	15,347	2,442	19,838
University of Cape Coast	1,200	18,746	1,012	20,958
University of Education-Winneba	-	56,612	3,304	59,916
University of Ghana	200	33,503	5,546	39,249
University of Professional Studies-Accra	1,585	8,378	718	10,681
Grand Total	10,031	173,203	21,079	204,313

Source: Author's analysis from research field data

All the seven participating institutions had valid institutional and programme accreditation. All seven institutions (100%) had Ghana national accreditation while six out of the seven institutions had both national and other international accreditations. Almost 72% of participants ($n = 38$) confirmed that all seven institutions had valid Ghana national accreditation whereas 28% ($n = 15$) indicated that their institutions possess both Ghana accreditation and other international accreditation status (see table 5).

Table 5: Participating Institutional Accreditation

Accreditation Status	No. of Institutions	*n*
National & Other Accreditation	6	15
National Accreditation only	7	37
Other Accreditations only	- [a]	-
Grand Total		53

Note. [a] No responses were found for 'Other Accreditation only'
Source: Author's analysis from research field data

Descriptive statistics

The descriptive analysis revealed that the variables, accounting information system and governance framework were significantly higher among the respondents ($M = 27.45, SD = 3.76$) and ($M = 26.77, SD = 4.93$) respectively. The mean values of the variables, financing scheme, cost management, pricing approach and financial sustainability were fairly distributed ($M = 18.96, SD = 4.60$), ($M = 21.38, SD = 4.44$), ($M = 18.72, SD = 6.24$) and ($M = 22.77, SD = 4.71$) respectively among the participants. The variance and range of the variable financing scheme was significant at ($Var = 38.90$, Range $= 24.00$) compared to the rest of the variables. The variable governance framework had the highest range of dispersion of 28.00 and a variance of 24.29. The test of skewness between the variables were sufficiently normal for the purpose of this study. Table 6 provides the details.

Table 6: Participants overall Response Ratings on Financial Sustainability

Variable	*N*	*M*	*SD*	*Var*	Range	Skew
Financing Scheme	53	18.96	4.60	21.19	21.00	-0.46
Governance Framework	53	26.77	4.93	24.29	28.00	-1.38
Cost Management	53	21.38	4.44	19.70	18.00	-0.31
Accounting Information Systems	53	27.45	3.76	14.14	21.00	-0.87

Pricing Approach	53	18.72	6.24	38.90	24.00	-0.88
Financial Sustainability	53	22.77	4.71	22.14	23.00	-0.08

Source: Author's analysis from research field data

Correlation analysis

The results of the correlation analysis revealed a relative degree of positive correlation between the independent variables financing scheme, governance framework, cost management, accounting information system and pricing approach and the dependent variable of financial sustainability. A Pearson's rank correlation analysis showed a significant positive correlation among the variables. The variables governance framework and cost management showed large positive correlation effect of $r = .574$ and $r = .570$ respectively, while financing scheme, accounting information systems and pricing approach revealed medium correlation effect of $r = .329$, $r = .365$ *and* $r = .400$ respectively. The relative degree of relationship or association between the independent variables and the dependent variable was found to be significant at $p < .05$. The following constructs: financing scheme, governance framework, cost management, accounting information system and pricing approach have a positive influence on financial sustainability (see table 7 below). The Spearman's r data analysis also revealed large built significant correlation between cost management and financial sustainability, governance framework and accounting information system at $r = .570$, $r = .570$ and $r = .422$ respectively.

Table 7: Summary of Intercorrelation between the Variables

	Variable	1	2	3	4	5	6	*M*	*SD*
1	Financial Sustainability	-	.329*	.574**	.570**	.365**	.400**	22.77	4.71
2	Financing Scheme	.329*	-	.498**	0.216	0.101	.290*	18.96	4.60
3	Governance Framework	.574**	.498**	-	.399**	.298*	0.229	26.77	4.93
4	Cost Management	.570**	0.216	.399**	-	.422**	0.211	21.38	4.44
5	Accounting Information Systems	.365**	0.101	.298*	.422**	-	0.227	27.45	3.76
6	Pricing Approach	.400**	.290*	0.229	0.211	0.227	-	18.72	6.24

M	22.77	18.96	26.77	21.38	27.45	18.72
SD		4.71	4.60	4.93	4.44	3.76	6.24

*Note. *p < .05, **p < .01.*
Source: Author's analysis from research field data

The correlation analysis enabled the study to establish whether there was any statistical relation between: financing scheme, governance framework, cost management, accounting information system, and pricing approach and financial sustainability. The analysis revealed a highest correlation of $r = .574$ at p value $p < .01$ significance level for governance framework, followed by cost management with $r = .570$ and pricing approach with $r = .400$. Accounting information system and financing scheme had the least correlation of $r = .365$ and $r = .329$ respectively. The correlation analysis suggests that there is evidence of statistical relationship between: financing scheme, governance framework, cost management, accounting information system and pricing approach and financial sustainability (see table 7 above). The analysis depicts that there is a positive impact between: financing scheme, governance framework, cost management, accounting information system and pricing approach and financial sustainability, while cost management impact positively on financial sustainability. The significance of the relationship was tested using regression analysis.

Regression analysis.

The researcher conducted regression analysis using SPSS version 25. The regression results further enabled a derivation of a regression equation for financial sustainability (Y_{FS}). The coefficient of determination (R^2) and the p value further enabled the best-fit model to be determined. The independent contributing factors for financial sustainability were financing scheme, governance framework, cost management, accounting information systems and pricing approach were the determinant in predicting the dependent variable (financial sustainability). A test of significance was undertaken using multiple regression analysis which yielded a coefficient of $r = .723$, $F (5, 47) = 120.21$, $p = .001$, $R^2 = .522$. From the analysis (see Table 8), three of the variables: governance framework, cost management and pricing approach) were found to be significant in predicting financial sustainability with p values $p = .006$, $p = .004$, $p = .039$ and beta

weights of .349, .374 and .174 respectively. Financing scheme ($p = .992$) and accounting information systems ($p = .633$) were not considered in determining the best-fit model since p values were above the threshold of $p < .05$. The results revealed that there was a significant positive relationship between the independent variables (governance, framework, cost management and pricing approach) and the dependent variable (financial sustainability) $F (5,47) = 120.21$, $p = .001$ and $R^2 = .522$. The results also showed the variables (governance framework, cost management and pricing approach) with the significant p values had 95% confidence positive intervals of .590, .625 and .338 respectively while the variables (financing scheme and accounting information systems) with the insignificant p values had 95% confidence negative intervals of -.247 and -.219 respectively.

Table 8: Regression Coefficient for Financial Sustainability

Variable	Coefficient	Std. Error	B	-95% CI	+95% CI	T	P
(Constant)	0.340	3.986		-7.678	8.358	0.085	0.932
Financing Scheme	-0.001	0.122	0.001	-0.247	0.244	-0.011	0.992
Governance Framework	0.349	0.120	0.365	0.107	0.590	2.904	0.006
Cost Management	0.374	0.125	0.353	0.123	0.625	2.997	0.004
Accounting Information Systems	0.069	0.143	0.055	-0.219	0.356	0.481	0.633
Pricing Approach	0.174	0.082	0.230	0.010	0.338	2.129	0.039

Note. CI = Confidence Interval

Source: Author's analysis from research field data

The results of the regression analysis revealed notable similarities with the results of the correlation analysis in relation to the variables with significant outcome and the degree of positive correlation.

The best-fit regression equation for financial sustainability is
$$Y_{FS} = a + \beta_{GLR} + \beta_{CM} + \beta_{PA},$$
Where Y_{FS} = financial sustainability (predictor variable),

a = constant value

β_{GLR} = governance framework (independent variable),

β_{CM} = cost management (independent variable), and

β_{PA} = pricing approach (independent variable).

Hence regression equation for $Y_{FS} = 2.324 + 0.365\beta_{GLR} + 0.353\beta_{CM} + 0.230\beta_{PA}$.

Discussion

The results of the study showed that participants had varied opinions about the level of influence of the individual factors (financing scheme ($1H_0$), governance framework ($1H_0$), cost management ($3H_0$), accounting information systems ($4H_0$) and pricing approach ($5H_0$)) on financial sustainability. Most participants alluded to the importance of financial sustainability in addressing their institutional set objectives. Previous studies found similar outcomes (Afriyie, 2015; Lucianelli & Citro, 2017; Sazonov et al., 2015). While similar studies in the past suggest a relationship between the individual factors (financing scheme, governance framework, cost management, accounting information systems and pricing approach) and financial sustainability (Amir et al., 2016; Bhayat, 2015; Brandas & Stirbu, 2013; Chatama, 2014; Collins, 2014) the results of this study show statistical evidence to support three out of the five factors as having statistically significant relationship.

Many studies relating to HEIs governance framework focused on its relevance to institutional growth and development but failed to address the effect on financial sustainability (Hornsby & Osman, 2014; Williams, 2015; Van Damme & Van der Wende, 2018) which may affect the future financial stability of the HEIs. This study sought a further understanding of the relationship between HEIs governance framework, and financial sustainability of public universities.

Another critical challenge confronting financial sustainability of public universities in Ghana is weak and ineffective cost management (Araújo & Rodrigo Gonçalves, 2014; Toopuu, 2015). This study established a clearer understanding of the relationship between cost management and financial sustainability leading to a reliable cost accumulation practice by public universities in Ghana. The study also concluded from the many previous research findings that Activity-Based-Costing (ABC) emerged as the most preferred and reliable cost management (Araújo & Rodrigo Gonçalves, 2014; Mahal & Hossain, 2015; Hoozée & Hansen, 2017) contrary to the standard cost management implemented by public universities in Ghana. A third major constraint is the challenges associated with pricing of HEIs activities which impacts directly on financial sustainability. This study sought to further enhance the studies conducted by Baum, Ma, Bell, & Elliott (2014), Mahal and Hossain (2015) and Perks (2013) about the management factors' importance to HEIs financial sustainability. The study established a better understanding of the relationship between the pricing approach ($5H_0$) and financial sustainability of public universities in Ghana.

All the five fundamental research sub questions of the study sought to determine whether there was a statistical relationship between financing scheme, governance framework, cost management, accounting information systems, and pricing approach and financial sustainability. The results established medium to large positive correlation between the independent variables and public universities financial sustainability. The correlation results sufficiently provided evidence that there was a relationship between financing scheme, governance framework, cost management, accounting information systems and pricing approach and financial sustainability as earlier observed by Amir et al. (2016), Chatama (2014), Hoozée and Hansen (2017) and Kwiek (2015). Further analysis to determine significance level of the variables: financing scheme, governance framework, cost management, accounting information systems and pricing approach to financial sustainability presented results that supported the rejection of the null hypothesis: $2H_0$, $3H_0$ and $5H_0$. The results thus illustrate significant relationship between governance framework, cost management and pricing approach on financial sustainability as Al-Haddad and Yasin (2018), Baum et al. (2014) and Toopuu (2015) earlier found in their studies. The finding of weak relationship between

the individual factors: financing scheme and accounting information systems, and financial sustainability contradicts many previous studies (Botlhale, 2015; Brandas & Stirbu, 2013; Nyahende, 2013).

The relevance of this study provides interesting findings which impact on HEIs, governments, government agencies HEIs regulatory institutions and donor agencies. The study should afford institutions in the education field to develop a deeper appreciation of the following constructs: financing scheme, governance framework, cost management, accounting information systems and pricing approach in developing a more robust and sustainable funding mechanism for HEIs in Ghana. Many studies in the past (Afriyie, 2015; Atuahene, 2015; Sazonov et al., 2015) have emphasised the individual importance of the factors to financial sustainability whiles paying less attention to the relevance of the interlinkages of these governance and management systems factors to HEIs financial stability. This study has however established the relative importance of the combined effect of the factors on HEIs financial sustainability of which not much past studies can be found in academic literature.

Conclusion

There is no doubt HEIs financial sustainability has been of great concern to university management, government, policy makers, and donor agencies among others (Almagtomea, Shakerb, Al-Fatlawic & Bekheetd, 2019). However, the difficulties in understanding the effect of the study factors on sustainable financing of HEIs is of increasing concern to many governments globally (de Lima et al, 2020). With the varied opinions expressed by participants relating to the factors influence on financial sustainability, developing a deeper appreciation of these determinants on HEIs financial viability should be of utmost importance to key stakeholders. The study identified significant relationship between governance framework, cost management and pricing approach, and financial sustainability, while establishing an insignificant relationship between financing scheme and accounting information systems and financial sustainability.

The findings challenge HEIs experts and the government of Ghana to develop a set of policies and legislations with emphasis on enhancing the governance frameworks of public tertiary institutions, refining the current costing systems and adopt pricing approach that support the overall sustainable growth of these institutions. The rather

surprising weak relationship results contrary to many finding from past studies (Barr & McClellan 2018; Nyahende, 2013) between financing scheme and financial sustainability calls for closer examination of the attribute by experts and researchers. The overall reported significance level from the analysis lends credence to previous studies (Carnoy et al., 2014; Dragija & Lutilsky, 2016; Morrison & Webb, 2015), which emphasised the importance of the individual factors to HEIs financial sustainability. The predictive model derived based on the strength of the significant level of the combined effect should influence management of HEIs in Ghana to focus attention on the relevance interlinkages of the factors on financial sustainability.

Practical recommendations.

The outcome of the study reveals a number of useful practical recommendations relating to HEIs financing schemes, governance, accounting information system, cost management and pricing which is worth considering by HEIs practitioners and experts.

1) Government HEIs financing policy reforms: The findings showed that the current financing scheme was not strong in influencing financial sustainability. The Ministry of Education may consider it worthwhile refocusing funding policy direction towards addressing skills gap in, science and technology and research. This may require funding to be allocated based on the specific needs input or research outcomes other than the current discretionary approach to funding allocations in Ghana (Newman & Duwiejua, 2015). The government through the Ministry of Education and the Ghana Tertiary Education Commission (GTEC) could develop a transparent costing guidelines to guide HEIs in implementing fair and transparent full cost recovery systems for academic programmes and activities similar to the guidelines prescribed by Estermann and Claeys-Kulik (2013), as the available literature suggest some significant lapses in the current Ghanaian public HEIs costing approach (Dragija & Lutilsky, 2016).

2) Governance review: Based on the findings there is a strong link between HEIs governance framework and financial sustainability, the ministry of education may cause to be reviewed current Acts establishing HEIs in Ghana with the view to incorporating current

best governance practices drawn from the African System (Ellis & Steyn, 2014) and the UK (Hogan, 2015), for example. Secondly, the current legal regime of HEIs in the country does not permit such institutions to independently determine and fix fees of academic programmes. This makes it impossible for HEIs in the country to ensure academic programmes are financially sustainable.

3) Costing implementation: HEIs administrators may have to re-engineer their current costing processes to adequately support accurate and reliable measure and aggregation of cost of academic programmes and activities. The standard costing method implemented by most public HEIs in Ghana is flawed with deficiencies in measuring cost per student accurately and effectively. A review of data from the 2012 NCTE on sustainable financing of higher education and the Ministry of Education (MOE) Education Sector performance report for 2015 revealed high levels of negative variations between the unit cost per student for public HEIs for the 2008/2009 and 2009/2010 academic years. For instance, in 2008/2009 academic year, actual unit cost per student stood at GH¢2,763 (MOE, 2015), while the standard cost estimate per student was GH¢7,899 (NCTE,2012), indicating a negative variation of 186% of actual unit cost. In 2009/2010, the actual unit cost for HEIs was GH¢2,620 and standard estimated unit cost per student of GH¢7,113, representing a variation of 172%.

4) The literature reviewed in the study points to the widely adoption of ABC in European, South Africa, Asia and a good number universities in the USA (Baum, Ma, Bell, & Elliott, 2014; Dragija & Lutilsky, 2016; Kostic, Jovanovic & Juric, 2019). The study consequently recommends the implementation of ABC for public HEIs in Ghana. Effective implementation of an activity-based-costing (Estermann & Claeys-Kulik, 2013), requires the implementation of an appropriate ICT support infrastructure and an enterprise wide accounting information systems (Ceran et al., 2016).

5) Pricing guidelines: The study found that public universities in Ghana were not permitted to price their academic programmes realistically. This current practice appears to be promoting

inefficiencies in the management of public universities and does not promote healthy competition among these institutions. The government, the Ministry of Education, university administrators and policy experts may have to reconsider a review of the current mechanism by allowing for realistic pricing of academic programmes and activities by developing an approach similar to what has been implemented in the UK (Perks, 2013), with the aim to achieving financial sustainability. This can best be initiated by the NCTE by engaging services of consultants to draft a blueprint for the consideration of stakeholders through a round table dialogue.

6) ICT systems infrastructure: The study discovered that ICT systems of HEIs in Ghana did not support effective enterprise reporting. There has been some effort in recent times aimed at enhancing the ICT infrastructure of these institutions. Most of these systems are stand-alone systems rather than Enterprise Resource Planning (ERP) that has proven to be efficient in the management of institutional Strategic Information Systems (SIS), Management Information Systems (MIS) and Tactical Information Systems (TIS) (Noaman & Ahmed, 2015). ERP deployed for HEIs in Ghana should be tailored to meet the specific needs, scope and functionalities of these institutions.

7) Student loans and grants review: The study established that students' loans and grants granted tertiary students were not sufficient in supporting their education expenditure. Whereas the average academic fees charged per semester per programme by HEIs in Ghana ranges from Gh¢2,000 and Gh¢2,500, the maximum loan students can access every semester is Gh¢1,500. A review of the current regime in line with similar students' loan schemes practised in the UK and Europe (Rakhmonov, 2016), should consider a loan amount sufficient to cater for students' academic fees (user fees), hostel or accommodation charges and living expenses in every academic year.

8) GETFund disbursement criteria: The study found that GETFund disbursement to public tertiary institutions in Ghana were aimed at mainly developing academic infrastructure, students' loans funds

releases to the Student Loan Trust Fund (SLTF) for disbursements to students' loan beneficiaries, and disbursements to support faculty staff development. The criterial for disbursement could not be established. Secondly, private tertiary institutions were not being considered in the current GETFund disbursement criteria. The current disbursement arrangement does not promote transparency and accountability, and is generally open to political interference as stated by Kwasi-Agyeman (2015). A review should aim to develop clear and transparent disbursement criteria to public tertiary intuitions. Private tertiary institutions that are Not-for-Profit by their establishment could be considered for some form of support in the areas of staff development, research, ICT and E-learning resources.

Recommendation for Further Research

There are substantial future research potentials worthy of examination in the area of higher education financial sustainability. The results of such future studies will be useful to researchers, higher education policy makers and educational administrators and regulators, and may well provide further elaboration on the study factors influence on financial sustainability. Notable future research areas relating to this study worthy of recommendation include

1) The limitation on the number of public higher education institutions requires further examinations. The study focused exclusively on only seven public universities in Ghana. Future research may well assess the factors' influence on higher education financial sustainability in all public higher educational institutions. The inclusion of all public higher educational institutions in the country will further provide a clearer insight on the relationship between the factors and financial sustainability.

2) The restrictions on the population and sample size of this study could well be examined in future research work. This may offer explanations relating to the factor's relationship with higher education financial sustainability. The scope could be widened to include experts from the regulatory agencies, the ministry of education and other notable higher education think tanks in Ghana.

3) Another potential future research area is considering the factors' influence on private university colleges' financial sustainability in Ghana. This study is based mainly on seven public universities, thus generalising the study outcome to include private university colleges may pose challenges.

4) In view of the time constraints, this study was limited to only five determining factors affecting public higher education financial sustainability. Future studies could explore the possibility of increasing the factors to establish an in depth understanding of their influence on higher education financial sustainability. Such factors as students' perceptions, quality, competitive strategy, leadership and performance management.

Finally, future research may consider conducting factor analysis to determine the factors importance to financial sustainability. Factor analysis should assist in eliminating factors that are less important to HEIs financial sustainability and rather subject critical factors to further test to determine their statistical significance.

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