Strategies Utilized to Mitigate Gaps in Differentiated Unit Cost Funding and their Relationship with Implementation of the Core Mandates of Public Universities in Kenya

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Abstract: The purpose of this study was to establish strategies utilized to mitigate gaps in Differentiated Unit Cost (DUC) funding in public universities in Kenya. Cross- Section research design and concurrent mixed methods approach were adopted. The target population was three hundred and sixty from which a sample of 108 was selected. Stratified random sampling was used to pick nine universities of study. Questionnaire reliability was determined using Cronbach's alpha index. Questionnaire's data were analysed using Pearson r, while, Interview data were analysed thematically. The results indicated a weak, negative correlation between the two variables, (r (68) = -.01, p = .951), which implied that, the relationship between strategies utilized to alleviate gaps in DUC funding and implementation of the core mandates of public universities in Kenya was not significant, thereby retaining the null hypothesis. The study recommended that public universities be allowed to charge tuition fees that reflect the reality on the ground.

Key Words: Funding; Differentiated Unit Cost; Strategies; Utilize; and Subsidies

1. Introduction

The topic of government financing of public colleges has generated a great deal of discussion and debate in numerous nations worldwide (Knight, 2018). The main justification for this kind of funding is premised on the idea that the whole society benefits when education is provided as way service to the public (Hazelkorn & Gibson, 2019). They go on to contend that government funding or free tuition should be allocated to higher education. All students, regardless of socioeconomic background, have increased access to higher education thanks to government funding of public universities (Marginson, 2016). An increase in education can have a major impact on a country's productivity, economic growth, and ability to compete internationally (Dima, Begu, Vasilescu, & Maassen, 2018).

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Voting, community service, and involvement in local government are examples of civic engagement and awareness that are frequently correlated with greater levels of education (Le & Nguyen, 2021). Research projects that may not be immediately profitable but are necessary for long-term advancements in science, technology, and society can be supported by public funding (Bozeman & Youtie, 2017). Universities are frequently hubs for cultural activity, supporting humanistic subjects like literature, the arts, and other subjects that might not get as much support in an education system that is solely focused on business and for which government money is appropriate (Burgett & Hendler, 2020).

Regrettably, state spending on higher education has decreased worldwide (Altbach, Reisberg, & Rumbley, 2019). Most nations have now imposed significant cuts in public expenditures for higher education, as if compelled by shifts in economic policy or otherwise satisfied with the state's diminished role in financing higher education (Newfield, 2016). Although it is more common in developing than in industrialized nations, the decline is not exclusive to them (Özdoğan Özbal, 2021). Increased tuition costs and student debt have frequently resulted from this decline (Mitchell, Leachman & Saenz, 2019). Mitchell et al. further asserts that because public funding for higher education in the US has not kept up with inflation, universities are placing an increasing amount of the financial burden on students.

The quantity of money available for higher education is constrained by the national budgetary constraints faced by many African governments (Lim, 2018). The need to pay for infrastructure, health care, elementary and secondary education, and other priority makes this worse (Altbach et al., 2019). In the opinion of Altbach et al., some governments have been raising their education budgets in recognition of the value of tertiary education based on increased enrollment. In light of this, universities need to come up with plans to make up for budget gaps in the DUC funding model.

1.2 Statement of the problem

Differentiated Unit Cost (DUC) funding is a financial method used by the majority of universities worldwide. Under this mechanism, different units, such as student enrollment in particular courses, receive different amounts of funding based on the actual cost of providing education in that particular unit. It acknowledges that the cost of running some programs like engineering or medicine, might be higher than that of other programs such as the arts or social sciences. Nonetheless, DUC as it existed then illustrated inadequacies brought about by inadequate government funding, variations in student enrollment, and shifting demands in the labor market. Even with government pressure to increase internal revenue-generating operations, the majority of public universities continued to generate less than 20% of their yearly financial requirements.

Even though the majority of universities are unable to produce more than 20% of their annual revenue internally, they lack plans to make up for DUC budget shortfalls. Due to current circumstances, the majority of public were unable to carry out their missions. Due to the negative effects on student performance, public universities had poor graduation rates. Because universities did not have sufficient funds to pay the higher salaries that come with promotions, consequently, there had been delays in academics' promotions. The research was conducted in order to identify solutions that could be used to mitigate financing gaps in DUC as there was no established methods for doing so.

1.3 Study Objective

The study's goal was to identify the tactics used to close financial gaps at DUCs and how they relate to the execution of public universities in Kenya's key missions.

1.4 Research Question

The following research question was asked:

"What is the relationship between the implementation of Kenyan public universities' key mandates and initiatives to reduce budget deficits in the DUC?"

1.5 Research Hypothesis

Ho: The execution of the fundamental responsibilities of Kenya's public universities and the methods used to repair budget gaps in the DUC do not significantly correlate.

1.6 Significance of the Study

Results of the survey would have a bearing on the primary mandates of public universities in Kenya, both theoretically and practically. The results would, theoretically, lead to a better understanding of government financing and how it relates to Kenyan public institutions' fundamental missions. In practical terms, the results would aid in resolving issues with resource sourcing and administration that public university administrators encounter.

1.7 Theoretical Framework

The economic theory served as the study's foundation. It makes three arguments in favor of increasing access, raising quality, and expanding quantity of education (Deming, 2022). These are: i) competition in higher education is advantageous; (ii) university education should be cost-shared; and (iii) student loans should have low interest rates and be income-contingent. The economic theory asserts that, in contrast to fifty years before, when wealthier nations typically had tiny university systems that offered degrees in a narrow range of fields, central planning of higher education is neither desirable nor viable now. It was believed that all universities were created equal and deserving of the same funding. There are more colleges, more students, and a far wider range of disciplines offered nowadays. Because of this, funding for various degrees at various universities must differ according to their unique attributes and prices. In theory, a central planner with unlimited knowledge could accomplish this.

The economic theory states that consumers who are well-informed stand to gain from competition. Although most students are well-informed, they still have room to learn more. The process is aided by the ability to plan ahead for university attendance, which gives the student the opportunity to gather the knowledge they require and consult with advisors. Therefore, it can be claimed that students are better able than planners to make decisions that align with their own interests and the interests of the economy since they are, or may eventually become, well-informed. To say otherwise would be to claim that pupils are incapable of making sensible decisions, even in the face of heavy restriction.

There are two types of benefits associated with a university education: public and private. There are more public advantages than private ones, and it makes sense to use tax breaks. Contrary to the perception that higher education is primarily publicly financed, which dates back to a time when the sector was small and absorbed relatively fewer resources, there is good evidence that the private benefits of higher education are substantial, and graduates should therefore bear some of the costs. However, measuring the exact proportion of public versus private benefits from higher education is difficult. The ways in which the world has altered necessitate a revised allocation of financial resources between taxpayers and graduates.

Three essential components should be present in student loans: they should have payback terms based on income; they should have an amount that covers both the cost of tuition and, if feasible, a portion of living expenses; and the interest rate should be determined by the government's cost of borrowing money. Income-contingent repayments are desirable; they are computed as x percent of the borrower's future earnings and are best collected in conjunction with income tax. Milton Friedman initially raised this issue, based on the imperfection in the capital market that resulted from borrowing to finance investments in human capital without any physical security (Popov, 2014). In order to satisfy the corresponding hazardous investment, he suggested that shareholders adopt limited liability in addition to equity investment. The equivalent of financing education would be to "buy" a person's future wages by providing the money required to finance their study, subject to the borrower accepting a predetermined percentage of their future income in return. Furthermore, he supported government loans since human capital would not be used as collateral.

Reducing student poverty and increasing access by making post-secondary education essentially free at the point of use is the second characteristic of well-designed loans: the loan amount should be sufficient to cover living expenses as well as fees, at least in wealthy nations (Deming, 2022). He maintained that loans ought to enable people to take out loans secured by their potential future income in order to fund investments in their own human capital. Loans cannot perform their efficiency purpose if they are too tiny. Lastly, the interest rate on loans ought to be about equivalent to the cost of borrowing for the government. Numerous nations, such as the UK and Australia, provide loans with no real interest rate. This strategy does not accomplish any one of the desired goals under a repayment scheme that is dependent on income. The financial cost of the subsidies is very high. Due to the ensuing financial strains, loans are inadequate, thus affecting accessibility. In addition to being severely regressive, the subsidies also crowd out university income, degrading quality.

1.8 Conceptual Framework

Through the intervening variable, there is a direct and indirect relationship between the dependent and independent variables.

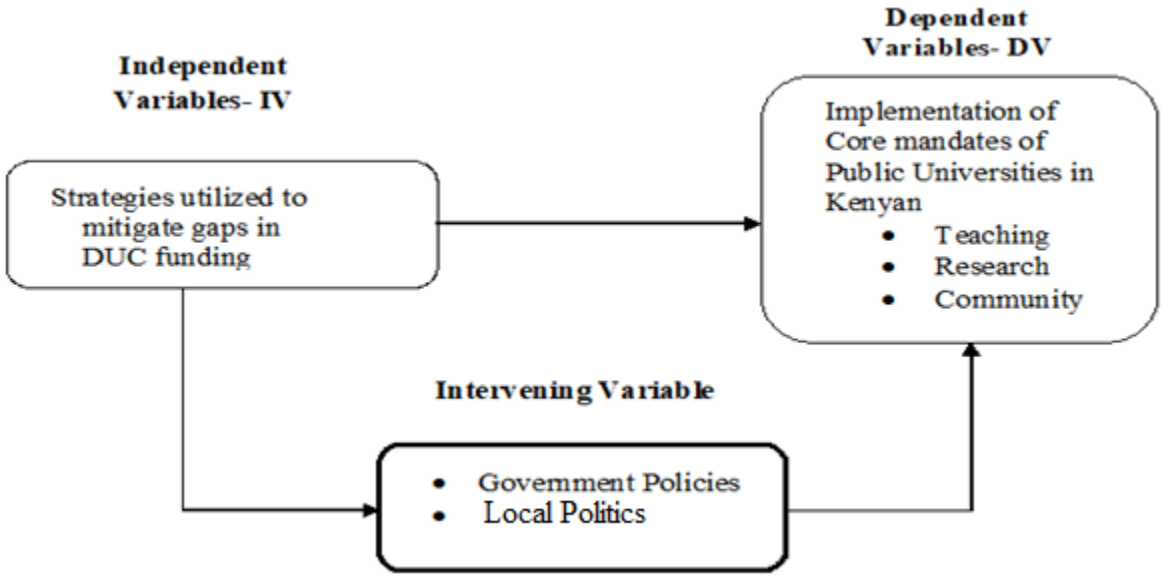

Figure 1: conceptual Framework

Source: Researcher 2024 (developed from the economic theory by Adam Smith)

2. Literature Review

Kenyan universities, like those in many other nations, were facing financial difficulties that could permanently change or perhaps destroy many of these institutions (Nganga, Waruru, & Nakweya, 2020). According to Nganga et al., administrators would need to think creatively in order to successfully navigate their institutions through this storm as colleges and universities struggled with budget shortages. Various colleges had experimented with various tactics, such as closing some of their campuses, selling off buildings or land, laying off employees, or even reducing the salary of senior officials. Some organizations had implemented general compensation reductions of 10% (Nganga, 2020). Daiya contends that while salary reductions are necessary, staff layoffs and compensation reductions are merely hasty decisions, rather, more commonplace business measures like department and unit reorganizations and salary reductions; which, companies would count as profits, would make more sense. Even while these "slash and burn" strategies had destroyed businesses and made shareholders and consultants extremely wealthy, they were ineffective and inappropriate for use in higher education (Daiya, 2020).

Despite the fact that senior administrators and university administration have been approaching their institutions more and more like companies, many critics have criticized these attempts at corporatization (Vedder, 2019). To lessen the effects of any financial shortfall, whether it be short-term or long-term, university administrators should devise more imaginative, moral, and responsible solutions (Daiya, 2020). In Daiya's opinion, before terminating professors and support workers, senior management ought to be the first to take a significant pay cut as a sign of their dedication to the company. For example, Scott Wyatt, the president of Southern Utah University, fulfilled his pledge to forgo his own pay one month prior to announcing any layoffs in May 2020 (Williams, 2020). In a similar vein, Ed Wingenbach, president of Hampshire College, voluntarily reduced his salary by 50% (Ezarik, 2020).

Some more tactics included: using excellence funds; allocating unused funds; and temporarily switching the requisition process to a current-use strategy (Daiya, 2020). He goes on to say that universities have the authority to revise and negotiate existing contracts with customers and suppliers. For instance, some organizations might offer their staff members first-rate health insurance, but others might have badly negotiated policies that end up costing far more than they should (Ballowe, 2008). In order to avoid losing millions of shillings, it is now necessary to renegotiate any such agreements that past governments left behind. Universities should take care to prevent using health-care expenditures as a covert means of reducing faculty members' salaries by switching providers and plans that make it more difficult for them to receive those services.

According Daiya (2020) and Groysberg and Abbot (2020), pay reductions should be staggered for other professors and staff personnel after administrators take a pay cut. However, it was necessary for university administrators to explain to academics and support personnel that the pay loss was just temporary and that they would receive their money back as soon as their financial strain subsides (ACTA, 2012). ACTA stated that the best way to optimize the results of those techniques was to carefully reduce the salaries of high earners before reducing those of other low earners. They would also defend those who were most affected by the deficit and the lowest paid members of the professors and staff (Daiya, 2020).

3. Research Paradigm

The pragmatic viewpoint was used in this study because it makes it possible to collect qualitative and quantitative data at the same time. To produce evidence in favour of best practices, it focuses on what works rather than what might be deemed absolutely and objectively accurate or actual. It is predicated on the epistemological idea that there are numerous methods to comprehend since there are numerous realities, rather than a singular approach to learning (Christensen, 2022).

3.1 Research Design

Concurrent mixed methods design was used in this study. The sample's qualitative and quantitative data on the research variable, strategies for reducing funding shortages from the government could be simultaneously collected according to the design. Comparatively speaking, concurrent mixed methods research minimizes this comparative deficit by using a fairly large sample in quantitative research, whereas qualitative research typically has a smaller sample size and is therefore not generalizable. Concurrent mixed techniques enhance the validity of the conclusion by providing contextualization and credibility when the qualitative and quantitative data converge (Naqvi, Al Aufi, & Tuzlukova, 2022). According to Naqvi, Al Aufi, and Tuzlukova, concurrent mixed method research uses empirical methods to examine modern phenomena in their natural habitats, particularly in situations when the lines separating the studied phenomena from their surroundings are seldom discernible. Naqvi et al. further assert that research design entails gathering data from a sample of respondents with comparable attributes about the same variables.

3.2 Location of the Study

Nine public universities located throughout Kenya were chosen to participate in this study.

3.3 Target Population

Casteel and Bridier (2021) states that the complete group of units for which inferences are to be drawn from study data is the target population. In any study, Defining the target demographic is as important as determining the aims of the survey (Casteel & Bridier, 2021). Three hundred and sixty (360) was the target population comprising 329 heads of faculties/schools/institutes, and 31 vice chancellors.

3.4 The Sampling Procedure

Nine institutions were selected using stratified random selection so that the thirty-one universities may be split into old and new categories. In this study, universities that were founded by a parliamentary act and were operational by the year 2000 were classified as old, whereas institutions were formed after that year were classified as new. As of 2017, there were 31 universities with charters; 26 were regarded as new, and 5 as old. Six of the twenty-six new institutions and three of the five old universities were carefully chosen. Out of the thirty-one public institutions, nine universities were chosen in total. This meant that since they were important informants, nine vice chancellors, or 29% of all vice chancellors in 31 universities, would be the subjects of qualitative data collection (Phasha, 2022). Using the 30% criterion, quantitative data were gathered from 99 school deans and rounded to the next whole number (Sharma, 2020).

3.5 The Sample Size for the Study

A sample size of 108 respondents was determined by applying the 30% criterion for populations under 1000 (Sharma, 2020). Old rural and old urban colleges were included in the sample, followed by new institutions. Nine vice chancellors and ninety-nine heads of faculties, schools, and institutes made up the Sample. 108 respondents in all were chosen from nine universities.

3.6 Methods of Data Collection

The used the following techniques to gather data: Interview and Survey. Seven public universities that were among the nine public institutions that were chosen at random participated in a research survey. But at the last minute, two of the chosen universities decided not to take part, leaving seven universities involved. The researcher charted how many heads of faculties, schools, and institutes there were at each of the participating universities. The survey gathered perspectives from heads of faculties, schools, and institutes regarding the methods used to close budget gaps in DUCs in connection to the execution of public universities' fundamental missions in Kenya. Ten heads of faculties, schools, or institutions from the two universities declined to participate in the study, leaving 89 heads of faculty, schools, or institutes with questionnaires to complete. In order to get factual data, this was required (Sreejesh, Mohapatra, & Anusree, 2014). In situations where completing the questions on the same day was not possible, the researcher arranged for a new time to pick up the completed forms.

Vice Chancellors from seven selected universities were the intended audience for the interview. Every one of the seven Vice Chancellors was interviewed in their offices at a time that was mutually agreed upon by the researcher and the respondents. There were 28 questions on the structured interview agenda. In order to better understand the Vice Chancellor's viewpoint on university funding and how it relates to the execution of Kenyan public universities' fundamental missions, interviews were held. Because conducting

interviews would produce rich sources of information on vice chancellors' experiences, viewpoints, goals, and emotions, this method was chosen (Moser & Korstjens, 2018). The approach also permitted mutually beneficial two-way communication, which, in part, allowed the researcher to address the topic of public university funding in considerable detail (Miller, Chepp, Wilson & Padilla, 2014).

3.7 Research Instruments

The following tools were employed: - A questionnaire and an interview schedule were utilized to gather data, both quantitative and qualitative. Because it facilitates the collection of data on knowledge, attitudes, opinions, behaviors, facts, and other reliable information, the questionnaire was employed (Denscombe, 2017). Conversely, interviews are a useful addition to survey questionnaires because they provide respondents with more flexibility than other data collection techniques and allow them to obtain more detailed information on the topics included in the questionnaires (Jain, 2021). Probing is made possible through interviews because the researcher can observe crucial non-verbal cues from respondents, such as scowls, twitches, and other movements, which enhance and clarify the meaning of hard data (Brown & Danaher, 2019). In addition, interviews are helpful in situations when participants cannot be watched closely; they enable participants to provide past information and give the researcher control over the direction of inquiry (Irani, 2019).

3.8 Validity of Instruments

The degree of systematic or inherent error in a measurement is known as its validity (Bolarinwa & Akeem, 2015). It is the degree to which data analysis findings accurately depict the subject of the investigation (Singh, 2017; Connell et al., 2018). A panel of academics and professionals in the field of educational management from Garissa University's department of education was used to determine validity. In order to determine if the test looks (at face value) to assess what it promises to, tests of face, content, and construct validity were conducted (Connell et al. 2018). By asking academics from Garissa University's Department of Education Management to score the validity of the questionnaire items as they appeared to them, a direct evaluation of face validity was acquired. The face validity was evaluated using the Likert scale. However, construct validity is employed to determine whether the questionnaire accurately captures the researcher's intended outcomes (Adeoye, 2024).

3.9 Instruments Reliability

Reliability, according to Cobern and Adams (2020), is a gauge of how well a research tool produces consistent outcomes. It displays the measuring device's accuracy (Sharma, 2016). Data were gathered from heads of faculties/schools/institutes at two public universities which had similar characteristics as the other nine, but would not be included in the sample. In total, 17 heads of faculties/schools/institutes from the two universities were polled. Because this sample was far higher than 10%, it was considered sufficient. The data from the questionnaires used in the pilot test was analyzed using SPSS.

Results from the pilot test were displayed in Table 1 The test yielded Cronbach's Alpha Coefficient of 0.714 against the threshold of 0.700. Since 0.714 is greater than 0.700, it implied that the questionnaire tool was reliable (Jain & Angural, 2017). They believed that an instrument's dependability could be assessed using a correlation coefficient (r) of roughly 0.7.

Table 1: Pilot Test Results

Cronbach's Alpha, α	Cronbach's Alpha, α based on standardized questions	Total number of Questions
0.714	0.714	09

Source: Primary Data

3.11 Data Collection Procedure

The researcher sought for a research permit from the National Commission for Science and Technology Innovation (NACOSTI) to conduct the study after the supervisors at the institution approved the research proposal. In order to conduct the Vice Chancellors' interview and have the deans fill out the questionnaires, the researcher scheduled dates and times with university leaders and deans. Once completed, the questionnaires were picked up and handed by hand. The respondents had one day to finish filling out the questionnaires.

3.12 Data Analysis Methods

A researcher's endeavor to accurately and dependably describe data gathered for a study is known as data analysis (Hayre, 2021). Massive amounts of unprocessed data from interviews and surveys were condensed into meaningless information that could be easily analyzed. According to Hayre, in order to make data analysis easier, gathered data needs to be precisely scored and arranged in a methodical manner. The researcher coded, tabulated, and prepared the data for use with the Statistical Package for the Social Sciences (SPSS) after scoring the data in Excel. Inferential statistics, such as the Pearson Product-Moment Correlation Coefficient (r), were used to assess the quantitative data obtained from the surveys' Likert scale items. The linear association between the techniques employed to minimize budget deficits at DUCs and the implementation of the fundamental mandates of Kenya's public institutions was established using the Pearson product-moment correlation coefficient, or r. Qualitative data was analyzed descriptively based on the themes developed for the study's objective. In order to provide as much information as possible in the most straightforward manner, descriptive statistics and Pearson correlations were also used (Mishra et al., 2019).

3.13 Ethical Consideration

After obtaining clearance from NACOSTI (National Commission of Science, Technology, and Innovations), the investigator gave a brief introduction to the participants, outlining his qualifications, field of expertise, and the purpose of the study. In order to reduce the possibility of fraud, the researcher was upfront about the subject and provided participants with sufficient information. The volunteers who showed up were safe and were never put in unnecessary danger during the whole data collection session. Individuals who volunteered to take part did so voluntarily and acknowledged the purpose of the research as well as any potential risks.

The researcher had no personal stake in the study's conduct, removing any potential conflicts of interest and preventing biased findings and generalizations. The researcher employed source citations and referencing to prevent plagiarism. No matter how sensitive or private the information was, the researcher maintained the participants' identities private in order to maintain their anonymity. It was urged to participants not to mark anything on the questionnaire that might allow others to identify them specifically.

4. Results

This section presented results on data quality control, Response rate, Descriptive statistics, Interview, and Correlations.

4.1 The Survey's Response Rate

This subsection, presented instruments return rate based on the total number of questionnaires send out or anticipated interviews.

4.1.1 Questionnaire

Displayed in table 2 is information on the number of questionnaires sent out and how many were returned in order to determine the response rate.

Table 2: Response Rate for Questionnaires

Questionnaires	Number	Rate	Percentage
Received	70	0.787	78.7
Not returned	19	0.213	21.3
Total	89	1.000	100

Source: Primary Data

Out of 89 questionnaires sent out, 70 were returned while 19 did not get returned. For the un returned questionnaires, some were not returned because the respondents could not be located either because they were not available in their offices at the time, the researcher went back to pick up the filled questionnaires.

4.1.2 Interview

According to CASRO (2018), the number of complete interviews divided by the number of non-interviews (refusals and non-contact) is called the response rate. In this study, seven Vice Chancellors were earmarked for interview, but only five were interviewed. Table 4 gives a summary of the response rate response rate.

Table 3: Response Rate for the Interview

Interviews	Number	Rate	Percentage
Completed	5	0.714	71.4
Non-interviews	2	0.286	28.6
Total	07	1.000	100

Source: Primary Data

From table 3, the total number of eligible interviews were 7 but only five interviews were completed. This gave a response rate of 0.714 or 71.4 %. On the other hand, two planned interviews did not take place due to refusal and non-contact. This number of incomplete interviews accounted for 28.6 % of all eligible interviews. Personal interviews have an average response rate of 36.6% (Fulton, 2018). The response rate of 71.4 % in this study is well above the threshold of 36.6 %.

4.2 Descriptive Statistics

4.2.1 Strategies utilized to mitigate gaps in DUC funding

Nine questionnaire items were used to discuss the methods taken to alleviate DUC funding shortfalls. The responses of the heads of schools/ faculties/ institutions were presented in Table 4. Based on the responses by heads of institutes/ faculties/ schools on item 1, which, dealt with universities having an attendance register for both lecturers and students; 24 (34%), 32 (46%), 12 (17%), 2 (3%), strongly agreed, agreed, disagreed, and strongly disagreed, respectively. In total, 14 (20%) of the heads of faculties, schools, and institutes disagreed in one way or the other that that universities kept tap on both students' and lecturers' attendance. Overall, 56 (70%) of the respondents concurred that both students and lecturers should have an attendance record at universities.

When asked if the university's budget was largely generated internally (item 2), the heads of schools/ institutes/ faculties responded as follows: 20 (29%) strongly disagreed, 4 (6%) strongly agreed, 26 (37%) disagreed, and 20 (29%) agreed that a lot of the university's budgets was generated internally. Overall, 46 (66%) of the heads of faculties, schools, and institutes disagreed in some way that the majority of the university's money was internally generated. Only 24 people (34 %) agreed that the university's budget is largely internally generated. The implication of these responses, simply suggest that the university's funding is dependant upon outside sources, such as government grants.

Regarding whether or not universities shut down campuses that no longer supported themselves, the responses on the item by the heads of faculties, schools, and institutes were as follows: 8 (11%) disagreed, 10 (14%) disagreed, 32 (46%) agreed, and 20 (28.6%) strongly agreed that universities should close those campuses that were no longer sustainable. 52 (66 %) of the heads of faculties, schools, and institutes agreed that universities should close those campuses that don't support themselves. Similarly,18 (34 %) of the heads of faculties, schools, and institutes disagreed that universities should close some of their campuses that were no longer able to support themselves. The decision to wind up some campuses that were not self-sustaining revealed that the affected universities were having financial challenges and were no longer able to continue sponsoring failing campuses.

Table 4: Responses by Heads of Faculties/ Schools/ Institutes on Strategies Utilized to Mitigate Gaps in DUC Funding

Questionnaire Item	Frequencies				Total
	Strongly Disagree	Disagree	Agree	Strongly Agree	
1. The University has an attendance register for lecturers and students	2	12	32	24	70
2. The university budget was largely internally generated	20	26	20	4	70
3. The university closed some campuses that were no longer sustainable,	8	10	32	20	70
4. The university disposed off land/ buildings in order to fill the gap in funding	34	23	11	2	70
5. The university Laid off staff because of budget short fall	15	16	24	15	70
6. Senior Administrators took a salary cut during the financial melt-down faced by the university	1	38	23	8	70
7. The university imposed specified salary cuts across the board	31	29	9	1	70
8. The university reorganized units and departments during budget deficit	8	10	28	24	70
9. The university budget deficit could be alleviated by well- priced tuition fees	4	11	35	20	70

Source: Primary Data

Based on the responses on item 4, 34 (49%) strongly disagreed, 23 (33%) disagreed, 11 (16%) agreed, and 2 (3%) strongly agreed that universities sold off land or buildings in order to cover for the funding shortfall. Generally speaking, 57 (81%) of the heads of faculties, schools, and institutes objected that universities sold buildings/ or land to make up for financing gaps. However, 13 (19%) of them agreed that universities sold buildings or land in order to make up for the shortfalls in financing. The leaders of the faculties, schools, and institutes who differed were from relatively newer universities that were chartered after massification was implemented by universities that had previously been established by an Act of Parliament.

Additional responses on item 5 (universities layoff employees due to budget shortages) by heads of faculties, schools, and institutes, indicated that 15 (21%) strongly disagreed, 16 (23%) disagreed, 24 (34 %) agreed, and 15 (21%) strongly agreed that universities laid off employees due to budget shortages. In all, 31 (44%) of the heads of faculties, schools, and institutes disagreed that staff layoffs at universities were caused by financial shortages. Similarly, 39 (56 %) of the participants agreed that staff layoffs at universities were caused by budget gaps.

Heads of schools/ faculties/ institutes responded in the manner that follows with regard to item 6 which was on university senior administrators taking a pay cut during the institution's financial crisis: 1 (1 %) strongly disagreed, 38 (54 %) disagreed, 23 (33 %) agreed, and 8 (11 %) strongly agreed that university

senior administrators took a pay cut during the institution's financial mess. Overall, 39 (56%) of the leaders of faculties/ schools, and institutes disagreed in some way with the statement that senior administrators at universities took a pay cut amid the institution's financial challenges. On the contrary, 31 (44 %) of the respondents agreed in one way or another that senior administrators slashed their salaries during the institution's financial melt-down.

Responses from heads of faculties, schools, and institutes on item 7 concerning universities enforcing specified salary cuts across the board showed that 31 (44%) strongly disagreed, 29 (41%) disagreed, 9 (13%) agreed, and 1 (1%) strongly agreed that universities imposed particular salary cuts across the board. Generally speaking, 60 (86%) of the leaders denied that universities were enforcing particular salary cutbacks on all employees. Similarly, 10 (14%) of them agreed that universities were enforcing uniform salary cuts.

With respect to the responses of heads of schools/ institutes/ faculties regarding universities reorganizing units and departments during budget shortfalls (item 8), 8 (11%) disagreed, 10 (14%) disagreed, 28 (40%) agreed, and 24 (34%) strongly agreed that universities reorganized units and departments whenever there were funding gaps. Overall, 18 (26%) of the heads of faculties, schools, and institutes disagreed that when universities had a budget gap, they reorganized departments and units. 52 (74%) of the respondents also agreed that departments and units within universities were reorganized when there was a budget shortfall. Answers to the question on whether well-priced student fees could fill the gap in the university budget deficit (item 9), the percentages of leaders who strongly disagreed, disagreed, agreed, and strongly agreed with this statement were 4 (6%) and 11 (16%), 35 (50%) and 20 (29%) respectively. In general, 55 (79%) of the respondents thought that the university's budget shortfall could be reduced by levying reasonable tuition fees. On the contrary, 15 (21%) of the respondents stated that high tuition fees could not lower the university's budget deficit.

4.2.2 Implementation of the Core Mandates of Public Universities in Kenya

The results in table 5 indicates the opinions of heads of institutes, faculties, and schools regarding the execution of the core missions of Kenya's public universities. The following were their responses when asked if the university had a high graduation rate: Of those leaders, 3 (4%) disagreed, 29 (41%) agreed, and 38 (54%) strongly agreed that the university had a good graduation rate. Generally, 96% of the leaders agreed that high graduation rates were a feature of the universities.

Table 5: Responses by Heads of Faculties/ Schools/ Institutes on the implementation of the core mandates public Universities in Kenya

Question	Responses				Total
	Strongly Disagree	Disagree	Agree	Strongly Agree	
1. The university experiences high graduation rate	-	3	29	38	70
2. The university has more than 1000 research publications in a year	11	31	16	12	70
3. The university participates in community development	2	14	30	24	70
4. The University engages in community research work	5	16	33	16	70
5. The university had continuing education courses, retraining and seminar courses, and courses for community workers	26	33	11	-	70
6. The university had programs tailored towards community development	-	2	28	40	70

Source: Primary Data

In response to the item on whether the university had more than 1000 research publications in a year, the heads of faculties, schools, and institutes, responses were as follows; 11 (16 %) strongly disagreed, 31 (44 %) disagreed, 16 (23 %) agreed, and 12 (17 %) strongly agreed that their university had more than 1000 research publications per year. On the account of these responses, it could be stated that the majority of Kenya's public universities had fewer than 1000 publications annually. With respect to the question on whether the university took part in community development; 2 (7 %) strongly disagreed, 14 (23 %) disagreed, 30 (47 %) agreed, and 24 (23 %) strongly agreed that the university participated in community development.

With respect to the question on whether the university took part in community research work; 5 (7 %) strongly disagreed, 16 (23 %) disagreed, 33 (47 %) agreed, and 16 (23 %) strongly agreed that their university took part in community development. In generally, 49 (70 %) of the respondents agreed that public universities were involved in community development, while 21 (30 %) of the respondents disagreed.

While responding to the question on whether the university had continuing education courses, retraining and seminar courses, and courses for community workers; 26 (37 %) strongly disagreed, 33 (47 %) disagreed, and 11 (16 %) agreed, that the university had continuing education courses, retraining and seminar courses, and courses for community workers. Overall, 84 % of the leaders disagreed that the university had continuing education courses, retraining and seminar courses, and courses for community workers.

Last but not least, the respondents were asked about their perceptions on whether the university had programs tailored towards community development. They responded as follows; 2 (3 %) disagreed, 28 (40 %) agreed, 40 (57 %) strongly agreed that the university programs were geared toward community

development. However, 68 respondents (97 %) agreed that university had programs tailored towards community development. Based on these findings, public universities in Kenya offered courses geared toward community development, including volunteer work in the areas like cleaning, tree planting, business consulting, and community health.

4.3 Interview Results

In order to determine how best to address financing shortfalls in the DUC that affect the execution of Kenya's public universities' fundamental missions, interviews were held. Five vice chancellors were surveyed utilizing an interview schedule. In order to facilitate analysis, the data from the interviews were categorized into three main topics, which were determined by the interview items. These themes included ensuring high-quality instruction and learning, meeting legal payroll requirements, and boosting internal revenue through research and teaching. The two components of each organization's strategy to reduce funding gaps for DUC were the implementation of a well-priced tuition fee for students, the reduction of the module II program, and the imposition of salary cuts on staff and senior administrators, respectively.

Vice Chancellors were questioned about the organization's efforts to close financing gaps in the DUC, specifically whether their university had seen a reduction in the module II program and how this had affected their financial flow. They were also requested to share their opinions on departmental and unit reorganizations as well as the university's implementation of reasonably priced tuition fees in an effort to bridge financing shortfalls for DUC. Based on the results of the interviews, four (80%) of the respondents indicated that module II programs were weakened when the DUC funding model was put into place in 2017. Universities battled to balance their budgets, selling off assets, and their module II student population declined to the point that they could not even accommodate all of the space at their main campuses. After 2017, only university C had a diminished module II curriculum.

Three of the four universities that saw a reduction in the module II program were brand-new, while just one was an established institution. Subsequent findings on the same topic show that Kenya's more recent public universities lacked a workable module II students' program that would have been a reliable source of revenue for the institutions. This suggests that the public university financial crisis is primarily affecting the more recent establishments. Regarding Vice Chancellors' opinions on department and unit reorganization, the data show that 100% of Vice Chancellors believed that doing so may help close financial shortfalls in the DUC. the order to help fill the budget deficits for DUCs, Kenya's state universities rearrange departments and units.

Regarding the implementation of reasonably priced tuition fees as a means of filling in funding gaps at DUC, the findings show that all Vice Chancellors surveyed agreed that reasonably priced student fees could do so, particularly if the government could devise a low-interest loan program that would allow students to borrow enough money to pay for both tuition and maintenance. This facility might be realized through collaboration between the public and commercial sectors, with the government acting as the guarantee. In this approach, the tax payer would be unaffected. Following graduation and after landing a job, the students could begin loan repayment.

The two halves of the theme, "Staff responsibility to mitigate gaps in DUC funding," were the vice chancellors' opinions on senior administrators taking pay cutbacks and the imposition of compensation reductions for all employees. According to the findings, three (60%) vice chancellors of universities B, C, and G stated that senior administrators' compensation reductions had less of an effect on closing funding shortages for DUCs. However, two (40%) Vice Chancellors of Universities A and D asserted that senior administrators' wage reductions had no effect on closing funding gaps for DUCs. According to these findings, the majority of senior administrators at public universities do not accept compensation reductions during economic downturns because they feel that such reductions will have little to no impact on easing the crisis.

Regarding Vice Chancellors' opinions on implementing uniform pay reductions, the findings show According to one university A vice chancellor (20%), enforcing uniform pay reductions had less of an effect on funding shortages for DUCs. Equal numbers of vice chancellors, however, claimed that enforcing uniform pay cutbacks would not have any effect on closing funding shortfalls for the DUC while others claimed that it would. Imposing targeted wage cutbacks across the board, according to two (40%) vice chancellors from universities B and C, did not have any effect on filling financial shortfalls for DUCs, whereas the other two (40%) vice chancellors from universities D and G stated that it would. The results show that public institutions' implementation of uniform, targeted salary reduction in response to financial shortfalls had little to no effect on reducing DUC funding deficits. This suggests that, although it is true that collecting resources from many sources will eventually fill the basket, senior administrators at public universities only trust "big money" to solve issues rather than beginning small.

The research question, "How do strategies utilized to mitigate gaps in DUC funding relate to gaps in DUC funding relate to implementation of the core mandates of public universities in Kenya?" seeks to ascertain the degree to which these strategies are related to the execution of the fundamental goals of Kenyan public universities. Using Pearson product-moment correlation analysis between strategies used to mitigate gaps in DUC funding and implementation of the core mandates of public universities in Kenya, 68 degrees of freedom (df) and alpha, $\alpha = 0.05$, was used to test the hypothesis. The analysis's findings were presented in Table 6.

The two variables showed a slight, negative association, according to the data ($r(68) = -.01$, $p = .951$). The null hypothesis was maintained since there was no significant correlation between the techniques used to minimize financial shortfalls in DUCs and the implementation of the key mandates of Kenyan public universities, as indicated by the p-value being bigger than the alpha-level ($p = .951 > \alpha = 0.05$).

Table 6*: Pearson's Correlation Analysis of Strategies Utilized to Mitigate Funding Gaps in DUC Funding*

Variable	Correlation	Strategies Utilized to mitigate gaps in DUC funding	University Core Mandates
Strategies Utilized to Mitigate Gaps in DUC Funding	Pearson Correlation	1	-.01
	Sig. (2-tailed)		.951
	N	70	70
University Core Mandates	Pearson Correlation	-.01	1
	Sig. (2-tailed)	.951	
	N	70	70

Source: Primary Data

4.4 Discussion

While the results of the interviews indicated that the module II program at Kenya's public universities was reduced, resulting in budget deficits from underutilized capacity, the results of the correlations indicated that the relationship between the strategies utilized to mitigate DUC funding shortfalls and the implementation of the core mandates of public universities in Kenya were weakly and negatively correlated, which led to the null hypothesis, "There is no significant relationship between strategies utilized to mitigate gaps in DUC funding and implementation of the core mandates of public universities in Kenya," was maintained based on correlation results between the strategies used to mitigate funding gaps in DUCs and the implementation of the core mandates of Kenyan public universities. These results showed a weak negative correlation.

These results are consistent with research by Daiya (2020), who contended that while salary reductions were necessary, staff layoffs and compensation reductions were merely hasty decisions; rather, more commonplace business actions like department and unit reorganizations and salary reductions or employee terminations would make more sense because salary reductions would be recorded as profits for the companies. Sadly, since public institutions are not for-profit establishments, this policy is ineffective in higher education.

4.5 Implications for Policy and Practice

These results imply that, unless funding is increased from its current level, even the finest approach may not result in the widespread implementation of the main missions of Kenya's public universities. Sufficient funding must be paired with strategies in order to preserve balance. The focus should therefore be on raising the funding levels while improving on the strategies.

5. Conclusion

While the results of the interviews indicated that the module II program at Kenya's public universities was reduced, resulting in budget deficits from underutilized capacity, the results from the correlations indicated a weak negative correlation between strategies utilized to mitigate funding gaps in DUC and actualization of the fundamental mission of public universities in Kenya. The implication of the finding is that coming up with more and better strategies to mitigate funding gaps in DUC does not lead to improved

implementation of the core mandates of public universities in Kenya. These strategies needed to be supported by sufficient funds in order to see a direct positive linear relationship between the variables. Differentiated unit cost funding posed some obstacles, but the ways in which these gaps were filled were vital to the success of Kenyan public institutions in carrying out their fundamental missions. Solving these problems involved more than just maintaining financial stability; it also involved meeting the country's demand for higher education and advancing its general growth.

5.1 Recommendations

The study demonstrated that budget deficits can be reduced by carefully calculating student fees. Therefore, in order for colleges to become more self-sustaining and less reliant on the government, the government shouldn't prevent them from raising tuition to reflect the current situation.

5.2 Suggestions for Future Research

1. The financing of private universities and how it relates to the fulfilment of their mandates.

2. To determine which model of activity- and program-based unit costs is superior, consider the relationship between activity-based student unit costs and excellent education.

Declaration

We confirm that all named authors have read and approved the manuscript. We also confirm that each author has the same contribution to the paper.

Conflict of interest

We also wish to state that there is no conflict of interest for this paper.

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