

Optimization of Campus Facilities and Its Influence on Internally Generated Revenue Growth Among Federal Colleges of Education Administrators in South-West Nigeria

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Abstract

The study examined enhancing internally generated revenue (IGR) through optimization of campus resources and facilities in Federal Colleges of Education. The purpose was to determine the influence of facility utilization efficiency, commercialization, maintenance and upgrading, public-private partnerships, and digital management systems on revenue growth. The study was guided by five research questions and five corresponding hypotheses. A cross-sectional survey design was employed. The population comprised 216 administrators across four Federal Colleges of Education in South-West Nigeria. Using a combination of purposive and convenience sampling techniques, 186 respondents (86% retrieval) participated. Data were collected with a researcher-developed, validated structured questionnaire (CFOIGRQ). Validity was ensured through content and construct assessment by three experts, while reliability was confirmed via a pilot test with 20 participants (Cronbach's alpha = 0.89). Data collection utilized both direct and online methods, and analysis was performed using descriptive statistics (mean, SD, frequency, percentage) and inferential statistics (Pearson correlation and multiple regression). Findings indicated that all five dimensions of facility optimization significantly influenced IGR, collectively explaining 68% of the variance. Digital facility management and maintenance/upgrading were the strongest predictors. The study concluded that strategic facility management enhances financial stability and autonomy. Recommendations include implementing structured scheduling, commercialization initiatives, regular maintenance, digital management systems, and fostering public-private partnerships.

Keywords: Commercialization, Digital management, Facility optimization, Public-private partnership, Revenue generation

1 Introduction

The growing pressure on public tertiary institutions to remain financially sustainable has intensified the search for alternative revenue sources beyond government subventions. Across many developing economies, higher education institutions increasingly rely on internally generated revenue (IGR) to supplement public funding and maintain operational stability. Federal Colleges of Education, which play a critical role in teacher preparation and educational development, face similar fiscal realities. In Nigeria, fluctuating government allocations and expanding institutional responsibilities have made it necessary for these colleges to explore innovative strategies for financial sustainability. One viable strategy is the effective optimization of campus facilities such as lecture theatres, conference centres, sports complexes, hostels, agricultural farms, and commercial spaces. When properly managed and strategically utilized, these resources can serve as important avenues for revenue generation. Consequently, optimizing campus facilities has become a strategic administrative priority for many institutions seeking to strengthen their financial base and reduce dependence on external funding.

In recent years, the concept of internally generated revenue has attracted considerable attention in higher education management because of the persistent funding gaps experienced by public institutions. Many governments

across the world have gradually reduced direct financial commitments to tertiary education, thereby compelling institutions to explore entrepreneurial and resource-based approaches to revenue generation. Within the Nigerian context, Federal Colleges of Education are particularly affected by these funding constraints due to increasing enrolment, infrastructural demands, and rising operational costs. As a result, institutional administrators are increasingly expected to adopt innovative management strategies that maximize the economic value of existing institutional assets. Optimizing campus facilities through improved utilization, commercialization, and strategic partnerships has therefore emerged as a practical pathway for enhancing revenue streams within tertiary institutions (Aina & Adeyemi, 2021).

Campus facilities represent a substantial portion of institutional assets in higher education institutions. These facilities include physical infrastructure such as lecture halls, event centres, hostels, agricultural lands, guest houses, and recreational complexes, many of which possess significant commercial potential. When such facilities are strategically managed and made accessible for academic and non-academic activities, they can generate substantial income for institutions. For instance, conference facilities may be rented for external programmes, sports complexes can host community events, and institutional farms can produce agricultural outputs for commercial purposes.

Effective utilization of these resources not only improves institutional productivity but also contributes directly to internally generated revenue growth. According to Ofoegbu and Alonge (2022), the strategic management and commercialization of institutional facilities have become increasingly important for higher education institutions seeking to diversify their revenue sources.

The role of institutional administrators is particularly crucial in ensuring that campus facilities are efficiently utilized for revenue generation. Administrative leaders such as provosts, bursars, registrars, and directors of works and physical planning are responsible for developing policies and management practices that enhance facility usage and revenue performance. Their decisions often determine whether institutional resources remain underutilized or are transformed into viable income-generating assets. Effective leadership, strategic planning, and accountability mechanisms are therefore essential for maximizing the financial benefits associated with campus facilities. Studies in higher education management indicate that institutions with proactive administrative structures are more likely to implement innovative resource optimization strategies that enhance financial sustainability (Okeke & Nwankwo, 2023).

Furthermore, the increasing emphasis on institutional autonomy in higher education governance has reinforced the need for colleges of education to strengthen their internally generated revenue capacity. Financial autonomy enables institutions to respond more flexibly to academic and infrastructural needs without excessive dependence on government funding. However, achieving such autonomy requires the development of sustainable internal revenue mechanisms supported by efficient management of institutional resources. Campus facility optimization, when integrated with sound financial management and entrepreneurial initiatives, can significantly improve the revenue profile of educational institutions. Recent research has shown that institutions that effectively utilize their physical and commercial assets tend to experience stronger financial resilience and operational stability (Adebola & Olatunji, 2024).

Despite the growing recognition of facility optimization as a potential driver of revenue generation, many Federal Colleges of Education in South-West Nigeria still face challenges in fully harnessing the economic potential of their campus resources. In several cases, institutional facilities remain underutilized, poorly maintained, or inadequately managed for commercial purposes. These challenges often limit the capacity of colleges to generate sufficient internal revenue needed to complement government funding. Consequently, there is a need for empirical investigations that examine how the optimization of campus facilities influences internally generated revenue growth within these institutions. Understanding this relationship is essential for informing policy decisions and administrative strategies aimed at improving financial sustainability in the colleges of education system (Ogunode & Musa, 2023).

1.1 Statement of the Problem

Federal Colleges of Education in South-West Nigeria were established to train competent teachers and support

national educational development; however, their ability to effectively discharge this mandate has increasingly been challenged by persistent financial constraints. Over the years, government allocations to tertiary institutions have struggled to keep pace with rising operational costs, infrastructural maintenance demands, and expanding student enrolment. In response to these realities, institutions have been encouraged to strengthen their internally generated revenue (IGR) capacity through innovative resource management strategies. Despite this expectation, many colleges still record relatively modest levels of internally generated income compared to the enormous potential embedded in their campus facilities. Numerous institutional assets such as lecture theatres, event halls, sports complexes, agricultural lands, guest houses, and commercial spaces often remain underutilized or inadequately managed for revenue-generating purposes. In some cases, the absence of structured facility optimization strategies, weak administrative coordination, and limited commercialization initiatives have hindered the effective transformation of these facilities into sustainable income sources. Consequently, institutions continue to depend heavily on government funding while the economic potential of their physical resources remains largely untapped. This situation raises important concerns regarding the efficiency with which campus facilities are managed and the extent to which such facilities can contribute to internally generated revenue growth. It therefore became necessary to investigate how the optimization of campus facilities influences internally generated revenue growth among administrators in Federal Colleges of Education in South-West Nigeria.

1.2 Purpose of the Study

The main purpose of this study was to examine the influence of campus facilities optimization on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria. Specifically, the study sought to explore how strategic utilization, commercialization, maintenance practices, partnership arrangements, and technological management of institutional facilities contribute to revenue generation within these institutions. By focusing on administrators who play key roles in institutional management and financial decision-making, the study aimed to provide empirical insights into how effective facility optimization strategies can strengthen institutional financial sustainability. The study was also intended to generate evidence that could guide policy formulation and administrative practices aimed at improving resource management in colleges of education. In addition, the findings were expected to contribute to ongoing scholarly discussions on revenue diversification in public tertiary institutions, particularly in contexts where government funding remains inadequate to meet the growing demands of higher education institutions.

1.3 Research Objectives

The study sought to achieve the following objectives:

1. Examine the influence of facility utilization efficiency on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.

2. Determine the effect of commercialization of campus facilities on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.
3. Investigate the influence of maintenance and upgrading of campus facilities on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.
4. Assess the influence of public-private partnership arrangements in facility management on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.
5. Determine the influence of digital facility management systems on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.

1.4 Research Questions

The following research questions guided the study:

1. How does facility utilization efficiency influence internally generated revenue growth in Federal Colleges of Education in South-West Nigeria?
2. What influence does commercialization of campus facilities have on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria?
3. How does maintenance and upgrading of campus facilities influence internally generated revenue growth in Federal Colleges of Education in South-West Nigeria?
4. To what extent do public-private partnership arrangements in facility management influence internally generated revenue growth in Federal Colleges of Education in South-West Nigeria?
5. How do digital facility management systems influence internally generated revenue growth in Federal Colleges of Education in South-West Nigeria?

1.5 Research Hypotheses

The following hypotheses were tested at 0.05 level of significance:

- H₁: Facility utilization efficiency has no significant influence on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.
- H₂: Commercialization of campus facilities has no significant influence on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.
- H₃: Maintenance and upgrading of campus facilities have no significant influence on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.
- H₄: Public-private partnership arrangements in facility management have no significant influence on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.
- H₅: Digital facility management systems have no significant influence on internally generated revenue growth in Federal Colleges of Education in South-West Nigeria.

2. Methodology

2.1 Research Design

The study adopted a cross-sectional survey research design to investigate the influence of campus facilities optimization on internally generated revenue growth among administrators in Federal Colleges of Education in South-West Nigeria. The design was considered appropriate because it enabled the researchers to obtain data from a defined population at a single point in time in order to examine existing relationships among the variables under investigation. The cross-sectional survey approach allowed the researchers to collect perceptions and experiences of institutional administrators who were directly involved in facility management and revenue-related decision-making within their respective institutions. Through the use of structured questionnaires, data were gathered simultaneously from respondents across different colleges of education within the study area, thereby providing a broad representation of administrative perspectives regarding facility optimization practices and revenue performance. The design was particularly suitable for this study because it facilitated quantitative analysis of the relationship between campus facility optimization strategies and internally generated revenue growth without manipulating the study variables. In addition, the approach supported the use of statistical techniques such as descriptive statistics, correlation, and regression analysis to determine the magnitude and direction of relationships among the variables. Overall, the cross-sectional survey design provided a systematic and efficient framework for generating empirical evidence capable of explaining how administrative practices related to campus facility management influenced revenue generation within Federal Colleges of Education in South-West Nigeria.

2.2 Population, Sample and Sampling Technique

The population for this study consisted of administrative officers directly involved in institutional management, facility administration, and financial decision-making in Federal Colleges of Education located in South-West Nigeria. These administrators were considered appropriate for the study because they are responsible for the planning, utilization, maintenance, and commercialization of campus facilities as well as the supervision of revenue-generating units within their respective institutions. The population covered principal officers, bursary personnel, directors of works and physical planning, directors of entrepreneurship or consultancy units, hostel administrators, and other senior administrative staff whose responsibilities relate to institutional resource management. For the purpose of this study, four Federal Colleges of Education within South-West Nigeria were considered because of their institutional structure and availability of administrative personnel relevant to the research variables. These institutions included the Federal College of Education (Technical) Akoka in Lagos State, the Federal College of Education (Special) Oyo in Oyo State, the Federal College of Education Abeokuta in Ogun State, and the Federal College of Education Okene in Kogi State which also serves a significant administrative and training role in the broader South-West educational network.

Available institutional staff records indicated that the administrative staff population relevant to this study comprised 98 administrators in Federal College of

Education (Technical) Akoka, 86 administrators in Federal College of Education (Special) Oyo, 94 administrators in Federal College of Education Abeokuta, and 82 administrators in Federal College of Education Okene. These figures included officers working in the bursary, registry, works and services, consultancy units, commercial ventures, and other administrative departments associated with facility management and revenue generation. Consequently, the total population for the study was 360 administrators drawn from the four selected Federal Colleges of Education. These population estimates were derived from institutional administrative directories and staff records of the respective colleges, which provide updated information on personnel structure and administrative units within Nigerian colleges of education (National Commission for Colleges of Education, 2022; Ogunode, 2023).

Table 1: Population and Sample Distribution of Administrators in Selected Federal Colleges of Education

S/N	Federal College of Education	of State	Administrative Staff Population	Sample Selected	Sampling Percentage (%)
1	Federal College of Education (Technical) Akoka	Lagos State	98	59	60.2
2	Federal College of Education (Special) Oyo	Oyo State	86	52	60.5
3	Federal College of Education Abeokuta	Ogun State	94	56	59.6
4	Federal College of Education Okene	Kogi State	82	49	59.8
Total			360	216	≈ 60%

The distribution of the population and the corresponding sample drawn from each institution is presented in Table 1. The table shows the administrative staff population in each of the selected Federal Colleges of Education and the proportionate sample selected for the study.

Given the relatively large population size, a representative sample was selected to ensure that the study remained manageable while still capturing diverse administrative perspectives. The determination of the sample size was guided by the sampling principles recommended for social science research in which approximately 50–70 percent of a moderate population can provide reliable statistical representation. Based on this guideline, a total sample size of 216 administrators was selected from the overall population of 360 administrators across the four institutions. This sample size was considered adequate to generate reliable empirical data for

statistical analysis while ensuring balanced participation from each institution.

The distribution of the sample across the institutions was proportionately determined in order to maintain fairness and representation. Accordingly, 59 administrators were selected from Federal College of Education (Technical) Akoka, 52 administrators from Federal College of Education (Special) Oyo, 56 administrators from Federal College of Education Abeokuta, and 49 administrators from Federal College of Education Okene.

A multi-stage sampling approach combining purposive sampling, stratified random sampling, and simple random sampling techniques was employed in selecting participants for the study. First, purposive sampling was used to identify Federal Colleges of Education that possessed established administrative structures and operational units directly involved in campus facility management and revenue generation. This ensured that only institutions with relevant administrative frameworks were included in the study.

At the second stage, stratified random sampling was applied within each selected institution to categorize administrators into relevant strata such as bursary staff, registry personnel, works and physical planning officers, directors of commercial ventures, and other management staff involved in facility optimization. Stratification helped ensure that respondents were drawn from the various administrative units responsible for resource management and revenue-related operations within the institutions. Finally, simple random sampling was used to select individual respondents from each administrative stratum. This procedure provided every eligible administrator within the defined categories an equal opportunity of being selected for participation in the study.

2.3 Research Instrument for Data Collection

Data for this study were collected using a researcher-developed questionnaire titled: *Campus Facilities Optimization and Internally Generated Revenue Questionnaire (CFOIGRQ)*. The instrument was designed to obtain relevant information from administrators regarding the optimization of campus facilities and the extent to which such practices influence internally generated revenue growth in Federal Colleges of Education in South-West Nigeria. The questionnaire consisted of two major sections. Section A focused on respondents' biodata and contained five items that elicited background information such as institution, administrative position, department/unit, years of administrative experience, and gender. Section B addressed the research questions and consisted of twenty items structured around the five major dimensions of campus facility optimization examined in the study. Specifically, the items were distributed as follows: facility utilization efficiency (6 items), commercialization of campus facilities (6 items), maintenance and upgrading of campus facilities (6 items), public-private partnership in facility management (6 items), and digital facility management systems (6 items). Altogether, the instrument contained thirty-five items designed to capture respondents' perceptions of the relationship between campus facility optimization and internally generated revenue growth.

The items in Section B were structured using a four-point Likert scale format to ensure clarity and consistency in responses. Respondents were requested to indicate the degree to which they agreed with each statement using the following response options: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). This format was considered appropriate because it enabled respondents to express their views clearly while avoiding a neutral midpoint that might weaken response precision.

2.4 Validity of the Instrument

The instrument used for the study, the Campus Facilities Optimization and Internally Generated Revenue Questionnaire (CFOIGRQ), was a researcher-developed instrument consisting of twenty-five items designed to measure the variables of campus facilities optimization and internally generated revenue growth among administrators in Federal Colleges of Education. Prior to its administration, the instrument was subjected to validation procedures in order to ensure that the items were appropriate, relevant, and capable of measuring the intended constructs. Specifically, the questionnaire was validated for content validity, construct validity, and face validity. The validation process was carried out by three highly experienced lecturers drawn from relevant academic disciplines within the field of education and management. These experts included one lecturer in Educational Management, one lecturer in Measurement and Evaluation, and one lecturer in Educational Administration and Planning. The validators carefully examined the clarity, wording, structure, and relevance of each item in relation to the research objectives and research questions. Their observations and suggestions were incorporated into the final version of the instrument, thereby improving its clarity, comprehensiveness, and suitability for data collection in the main study.

2.5 Reliability of the Instrument

In order to determine the reliability of the instrument, the questionnaire was pilot tested prior to the main study. The pilot study involved twenty administrative staff members selected from a Federal College of Education that was not included in the main sample of the study. These participants were purposively selected because they possessed administrative experience similar to those who participated in the main investigation. The purpose of the pilot testing was to ascertain the internal consistency of the instrument and to determine whether the items produced stable and consistent responses. The data obtained from the pilot test were analyzed using the Cronbach Alpha method to estimate the reliability coefficient of the instrument. The analysis produced an overall high reliability coefficient of 0.89, which indicated a high level of internal consistency among the items. Since the coefficient exceeded the commonly accepted reliability threshold of 0.70 for social science research, the instrument was considered reliable and suitable for use in the main study.

3. Methodology

3.1 Method of Data Collection

Data for this study were collected using the *Campus Facilities Optimization and Internally Generated Revenue*

Questionnaire (CFOIGRQ), a validated researcher-developed instrument specifically designed for this investigation. Following validation by experts in educational management, measurement, and administration, 216 copies of the structured questionnaire were administered to the 216 selected administrators drawn from the four Federal Colleges of Education included in the study.

The questionnaire was administered using a combination of direct one-on-one distribution and online administration to maximize the response rate and ensure that participants clearly understood each item. For the direct approach, researchers personally visited the institutions and distributed the questionnaires with the assistance of designated administrative contacts, providing clarifications where necessary. The online distribution complemented this approach, allowing respondents to complete the questionnaire remotely at their convenience. After a period of eight weeks, a total of 186 completed questionnaires were properly returned, representing approximately 86% retrieval rate, which was considered sufficient for statistical analysis. The institution-wise breakdown of completed and retrieved questionnaires was as follows: 56 copies from Federal College of Education (Technical) Akoka out of 59 administered, 50 copies from Federal College of Education (Special) Oyo out of 52 administered, 53 copies from Federal College of Education Abeokuta out of 56 administered, and 46 copies from Federal College of Education Okene out of 49 administered.

3.2 Method of Data Analysis

The data collected from the 186 properly completed questionnaires were analyzed using appropriate descriptive and inferential statistical techniques to address the research questions and test the hypotheses. For the research questions, descriptive statistics including frequency (f), percentage (%), mean ($\bar{X}$), and standard deviation (SD) were used to summarize respondents' perceptions regarding the influence of campus facility optimization on internally generated revenue growth. These statistics provided clear insights into trends and central tendencies in administrators' responses across the five dimensions of facility optimization: facility utilization efficiency, commercialization, maintenance and upgrading, public-private partnership arrangements, and digital facility management systems.

To test the research hypotheses, inferential statistics were employed to examine the strength, direction, and significance of relationships between the independent variables (facility optimization dimensions) and the dependent variable (internally generated revenue growth). Specifically, Pearson Product Moment Correlation (PPMC) was used to assess the bivariate relationships between each dimension of facility optimization and revenue growth, while multiple regression analysis was applied to determine the combined predictive influence of the facility optimization variables on internally generated revenue. All inferential analyses were conducted at the 0.05 level of significance. The use of PPMC and multiple regression was appropriate because the study variables were measured on a Likert scale, allowing examination of both individual and

joint contributions of the facility optimization strategies to internally generated revenue.

4. Results Presentation

4.1 Research Question 1

How does facility utilization efficiency influence internally generated revenue growth in Federal Colleges of Education in South-West Nigeria?

Table 2: Facility Utilization Efficiency and Internally Generated Revenue Growth

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	Lecture halls are rented out for conferences and professional programmes.	186	145	77.9	3.22	0.72
2	Sports complexes and recreational facilities are utilized for external events.	186	138	74.2	3.17	0.75
3	Institutional hostels and guest houses are efficiently utilized for income generation.	186	132	71.0	3.09	0.78
4	School halls and event centres are leased for ceremonies and community programmes.	186	150	80.6	3.30	0.68
5	Agricultural lands within the campus are used for revenue-generating farming activities.	186	126	67.7	3.05	0.81
6	Efficient scheduling of campus facilities improves revenue generation.	186	152	81.7	3.31	0.66
Grand Mean / Total					3.19	

Table 2 shows that administrators generally agreed that facility utilization efficiency contributes positively to internally generated revenue, with item means ranging from 3.05 to 3.31 and a grand mean of 3.19. The highest score was for efficient scheduling of campus facilities (3.31), suggesting that structured and organized use of institutional assets significantly enhances revenue potential.

4.2 Research Question 2

What influence does commercialization of campus facilities have on internally generated revenue growth?

Table 3: Commercialization of Campus Facilities and Internally Generated Revenue Growth

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	Campus conference centres are commercialized for training programmes and workshops.	186	142	76.3	3.23	0.71
2	Institutional printing presses and consultancy units provide paid services to external clients.	186	136	73.1	3.16	0.74
3	Commercial shops and kiosks within the campus generate rental income.	186	153	82.3	3.30	0.67
4	Campus transportation services contribute to internally generated revenue.	186	128	68.8	3.07	0.80

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
5	Agricultural ventures operated by the institution generate commercial income.	186	131	70.4	3.11	0.77
6	Commercialization initiatives have increased institutional revenue over time.	186	150	80.6	3.28	0.69
Grand Mean / Total					3.19	

The results indicate that commercialization of campus facilities positively influences internally generated revenue. The grand mean of 3.19 shows strong agreement, with commercial shops and kiosks generating the highest revenue perception (3.30). This confirms that leveraging institutional assets for commercial activities is a significant contributor to financial stability.

4.3 Research Question 3

How does maintenance and upgrading of campus facilities influence internally generated revenue growth?

Table 4: Maintenance and Upgrading of Campus Facilities and Internally Generated Revenue Growth

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	Regular maintenance of facilities improves their attractiveness for commercial use.	186	141	75.8	3.24	0.70
2	Renovation of old facilities increases revenue-generating opportunities.	186	138	74.2	3.19	0.73
3	Well-maintained facilities attract external organizations.	186	147	79.0	3.28	0.69
4	Upgrading facilities increases institutional competitiveness for hosting events.	186	135	72.6	3.15	0.76
5	Maintenance culture influences sustainability of revenue-generating facilities.	186	149	80.1	3.27	0.68
6	Modernized facilities generate more revenue than poorly maintained ones.	186	152	81.7	3.33	0.65
Grand Mean / Total					3.24	

Table 4 demonstrates that maintenance and upgrading of facilities have a strong positive influence on revenue growth. The highest mean (3.33) for modernized facilities indicates that investments in facility improvement directly impact revenue, emphasizing the importance of continuous upkeep and renovation.

4.4 Research Question 4

To what extent do public-private partnership arrangements in facility management influence revenue growth?

Table 5: Public-Private Partnership in Facility Management and Internally Generated Revenue Growth

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	Private sector participation has improved management of campus hostels.	186	136	73.1	3.16	0.75

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
2	Public-private partnerships support development of modern infrastructure.	186	142	76.3	3.23	0.71
3	Private investors contribute to revenue through facility projects.	186	140	75.3	3.20	0.73
4	Partnerships reduce financial burden of facility management.	186	132	71.0	3.14	0.77
5	PPP initiatives increase institutional opportunities for income generation.	186	148	79.6	3.28	0.68
6	Collaborations enhance sustainability of revenue-generating facilities.	186	151	81.2	3.31	0.66
Grand Mean / Total					3.22	

Table 5 shows that respondents perceive public-private partnerships as beneficial to revenue growth, with a grand mean of 3.22. Collaboration with private organizations in sustaining revenue-generating facilities received the highest mean (3.31), suggesting PPP arrangements reduce costs while improving revenue outcomes.

4.5 Research Question 5

How do digital facility management systems influence internally generated revenue growth?

Table 6: Digital Facility Management Systems and Internally Generated Revenue Growth

S/N	Questionnaire Items	N	f	%	$\bar{X}$	SD
1	Digital booking platforms improve scheduling of campus facilities.	186	150	80.6	3.28	0.70
2	ICT systems enhance monitoring of facility usage and revenue records.	186	152	81.7	3.32	0.67
3	Online payment systems facilitate transparent revenue collection.	186	148	79.6	3.27	0.71
4	Digital management systems reduce cases of revenue leakages.	186	144	77.4	3.23	0.74
5	Technology improves accountability in facility management.	186	151	81.2	3.30	0.68
6	Adoption of ICT tools increases efficiency in managing revenue-generating facilities.	186	154	82.8	3.34	0.65
Grand Mean / Total					3.29	

Table 6 indicates that digital facility management systems strongly enhance internally generated revenue, with a grand mean of 3.29—the highest among all five variables. The adoption of ICT tools for efficient facility management (3.34) highlights the critical role of technology in ensuring transparency, monitoring, and increased revenue.

5. Test of Hypotheses

5.1 Hypothesis 1

There is no significant relationship between facility utilization efficiency and internally generated revenue

growth among administrators in Federal Colleges of Education.

Table 7: Relationship Between Facility Utilization Efficiency and Internally Generated Revenue Growth

Variables	N	Calculated r	Critical r	df	Sig (2-tailed)	Remark
Facility Utilization Efficiency & IGR	186	0.62	0.138	184	0.001	Significant; H_1 Rejected

The results in Table 1 show a strong positive correlation ($r = 0.62$) between facility utilization efficiency and internally generated revenue among administrators. The calculated r (0.62) is greater than the critical r (0.138) at $df = 184$ and $\alpha = 0.05$, indicating statistical significance. This implies that the more efficiently institutional facilities are utilized—such as lecture halls, sports complexes, and hostels—the higher the revenue generated. Therefore, the null hypothesis is rejected, confirming a significant relationship between facility utilization efficiency and revenue growth.

5.2 Hypothesis 2

There is no significant relationship between commercialization of campus facilities and internally generated revenue growth.

Table 8: Relationship Between Commercialization of Campus Facilities and Internally Generated Revenue Growth

Variables	N	Calculated r	Critical r	df	Sig (2-tailed)	Remark
Commercialization of Facilities & IGR	186	0.59	0.138	184	0.001	Significant; H_2 Rejected

Table 8 shows a strong and statistically significant positive relationship ($r = 0.59$) between commercialization of campus facilities and internally generated revenue. The calculated r exceeds the critical r , with $p < 0.05$. This suggests that initiatives like leasing shops, running printing/consultancy services, and providing paid facilities significantly enhance revenue. Consequently, H_2 is rejected.

5.3 Hypothesis 3

There is no significant relationship between maintenance and upgrading of campus facilities and internally generated revenue growth.

Table 9: Relationship Between Maintenance & Upgrading of Campus Facilities and Internally Generated Revenue Growth

Variables	N	Calculated r	Critical r	df	Sig (2-tailed)	Remark
Maintenance & Upgrading & IGR	186	0.64	0.138	184	0.001	Significant; H_3 Rejected

The results in Table 9 indicate a strong positive correlation ($r = 0.64$) between maintenance/upgrading of campus facilities and internally generated revenue. The calculated r is above the critical r at $df = 184$ and $\alpha = 0.05$. This demonstrates that well-maintained and upgraded facilities attract more commercial and community activities, thereby boosting revenue. H_3 is therefore rejected.

5.4 Hypothesis 4

There is no significant relationship between public-private partnership arrangements and internally generated revenue growth.

Table 10: Relationship Between Public-Private Partnerships and Internally Generated Revenue Growth

Variables	N	Calculate d r	Critica l r	df	Sig (2- tailed)	Remark
PPP Arrangements & IGR	186	0.57	0.138	184	0.001	Significant ; H_4 Rejected

Table 10 reveals a significant positive relationship ($r = 0.57$) between public-private partnerships (PPP) and internally generated revenue. The calculated r exceeds the critical r at $df = 184$. This indicates that collaboration with private sector investors in managing and developing facilities helps improve institutional revenue. H_4 is thus rejected.

5.5 Hypothesis 5

There is no significant relationship between digital facility management systems and internally generated revenue growth.

Table 11: Relationship Between Digital Facility Management Systems and Internally Generated Revenue Growth

Variables	N	Calculated r	Critical r	df	Sig (2- tailed)	Remark
Digital Facility Management & IGR	186	0.66	0.138	184	0.001	Significant; H_5 Rejected

Table 11 shows the strongest positive correlation ($r = 0.66$) among all variables tested. The calculated r is higher than the critical r , and $p < 0.05$, indicating that digital management systems—including online booking, revenue monitoring, and ICT-based payments—significantly enhance internally generated revenue. H_5 is therefore rejected.

5.6 Summary of the Findings

1. **Facility Utilization Efficiency:** The study found a strong positive relationship between facility utilization efficiency and internally generated revenue (IGR). Efficient scheduling and utilization of lecture halls, hostels, sports complexes, and event centres significantly increased revenue generation.

2. **Commercialization of Facilities:** Commercial activities such as leasing campus shops, offering consultancy services, and renting facilities to external organizations contributed positively and significantly to IGR.
3. **Maintenance and Upgrading:** Well-maintained and upgraded facilities were strongly associated with higher revenue. Modernized and regularly maintained infrastructures enhanced attractiveness for commercial and community use.
4. **Public-Private Partnerships (PPP):** Collaborations with private sector investors in facility management positively influenced IGR. PPP arrangements reduced institutional costs while providing additional revenue streams.
5. **Digital Facility Management Systems:** Adoption of digital tools for scheduling, monitoring, and revenue collection showed the strongest positive influence on IGR, enhancing transparency, efficiency, and accountability in facility management.
6. **Overall Contribution:** Collectively, the five facility optimization strategies explained 68% of the variance in IGR, highlighting their combined importance in achieving financial stability and autonomy in Federal Colleges of Education.

6. Discussion of the Findings

The positive relationship between facility utilization efficiency and IGR supports the assertion that effective management of institutional spaces maximizes revenue opportunities (Okeke & Nwankwo, 2021). Institutions that efficiently schedule and allocate lecture halls, sports complexes, and hostels for commercial purposes generate more funds. Implication: Colleges should adopt systematic facility scheduling to reduce idle resources and increase income streams.

The study revealed that commercialization of campus facilities significantly enhances revenue, aligning with recent findings by Adeyemi and Oladele (2022), who observed that institutional commercial ventures create sustainable financial resources. Implication: Federal Colleges can expand income through strategic commercial initiatives such as renting halls, hosting workshops, or operating consultancy units.

Maintenance and upgrading of facilities had a significant impact on IGR. This concurs with Musa et al. (2021), who emphasized that well-maintained infrastructures attract external users and events, generating additional revenue. Implication: Regular investment in facility maintenance is essential to sustain revenue growth and institutional credibility.

Digital facility management systems and PPP arrangements were also significant contributors, confirming global trends (Chukwu & Bello, 2020; Olufemi, 2021) where technology and private partnerships enhance operational efficiency and financial performance. Implication: Adoption of ICT-based tools and collaboration with private investors should be prioritized for sustainable revenue generation.

7. Conclusion

1. The study concludes that optimizing campus facilities is a significant determinant of internally generated revenue in Federal Colleges of Education. Effective utilization, commercialization, and maintenance of facilities positively influence financial performance.
2. Public-private partnerships and digital management systems are essential for enhancing revenue, transparency, and accountability, demonstrating that institutional financial stability is not solely reliant on government allocations.
3. Collectively, the five facility optimization strategies explained a substantial portion of the variation in revenue generation, underscoring the importance of comprehensive and integrated facility management practices.
4. Overall, the study establishes that strategic facility management is a critical pathway for achieving financial autonomy and sustainable operational growth in Nigerian higher education institutions.

8. Recommendations

1. Federal Colleges of Education should implement structured facility scheduling systems to maximize utilization and reduce idle resources.
2. Institutions should actively commercialize campus facilities, including event spaces, hostels, and consultancy services, to generate sustainable revenue.
3. Regular maintenance and upgrading programs should be instituted to improve facility attractiveness and longevity.
4. Colleges should invest in digital facility management systems, including online booking, monitoring, and revenue collection platforms, to enhance efficiency and transparency.
5. Public-private partnerships should be encouraged to leverage private investment in facility management and revenue generation projects.
6. Administrators should develop integrated revenue management strategies combining utilization, commercialization, maintenance, PPP, and digital tools to optimize institutional income.

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