

Strategic Management of the Centre for Entrepreneurship and ICT for Innovation, Revenue Generation, and Student Employability: A Case Study of Federal University Dutse

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Abstract

Purpose: This study examines the strategic management of the Entrepreneurship Centre and ICT Directorate at Federal University Dutse, Nigeria, with the aim of developing a framework for transforming the two units into sustainable hubs for innovation, revenue generation, and student employability.

Methodology: The study adopted a pragmatic research paradigm, employing a single embedded case study design and a convergent parallel mixed-methods approach. Data were collected from 240 students, staff, and external stakeholders through questionnaires, interviews, and focus group discussions. Quantitative data were analysed using Ordinary Least Squares (OLS) regression, while qualitative data were analysed thematically. Institutional Theory and the Resource-Based View (RBV) guided the study.

Results and conclusion: The findings revealed that strategic planning, resource allocation, stakeholder engagement, and monitoring and evaluation had no statistically significant effects on revenue generation, innovation output, or student employability. Qualitative evidence identified inadequate funding, bureaucratic bottlenecks, weak institutional support, and poor coordination between the two units as key constraints. Consequently, a three-phase strategic management framework comprising institutional alignment, implementation and resource orchestration, and sustainability and scaling was developed.

Implication of findings: The framework offers practical guidance for integrating entrepreneurship and ICT functions into a unified innovation ecosystem that enhances financial sustainability, innovation capacity, and student employability in Nigerian public universities.

Keywords: Strategic management; Entrepreneurship; ICT; student employability; Innovation.

1. Introduction

Globally, higher education institutions have evolved from purely academic centers to innovation-driven ecosystems that drive national development, support entrepreneurship, and generate substantial institutional revenue (Etzkowitz & Zhou, 2022). In developed countries such as the United States, United Kingdom, and other parts of Europe, universities have transitioned into entrepreneurial institutions by integrating innovation, research commercialization, and industry partnerships into their core mandates. For example, institutions like MIT in the US and the University of Cambridge in the UK have leveraged their research outputs, intellectual property rights, and startup incubators to generate billions in annual revenue while also creating jobs and enhancing their global competitiveness (Yusuf et al., 2023; Brown & Hesketh, 2021).

These universities have successfully monetized their entrepreneurship and ICT centers through ventures such as certification programs, tech incubators, patent licensing, industry collaborations, and spin-off companies. The University of Oxford, for instance, generated over £200 million in 2023 through research commercialization and innovation-led enterprises (University of Oxford Innovation, 2023). Similarly, US institutions like Stanford and Harvard generate revenue from endowments and tech startups launched by their faculty and students (National Science Foundation [NSF], 2022). In Rwanda, the African Centre

of Excellence in Data Science offers ICT certifications that attract international participants, strengthening institutional income and regional employability (African Centre of Excellence in Data Science, 2024).

In contrast, the evolution of Nigerian universities into innovation-driven institutions has been slow and fragmented, especially in public universities. Despite several government efforts to deregulate the education sector and reduce its spending on higher education, many Nigerian universities remain financially dependent on federal subventions and lack the autonomy or strategic direction to become self-sustaining (BusinessDay, 2023). For instance, the proposed 40% deduction from Internally Generated Revenue (IGR) by the federal government has sparked concerns about the financial viability of public universities (Punch, 2023). Institutions such as the University of Abuja and Ahmadu Bello University have reported that monthly electricity bills now exceed ₦200–₦300 million, threatening their ability to maintain basic utilities (Daily Trust, 2024).

The Federal University Dutse (FUD) exemplifies both the potential and the challenges of university-based innovation in Nigeria. FUD hosts a Centre for Entrepreneurship equipped with machinery for producing sachet water, bread, tailoring, and shoe-making, as well as an ICT Directorate with computer labs and internet infrastructure. However, these centers are underutilized and not operating to their full potential due to poor strategic planning, lack of innovation, and the absence of long-term sustainability frameworks (Osodeke, 2024).

Globally, higher education institutions have evolved from purely academic centers to innovation-driven ecosystems. In Nigeria, however, this evolution has been slow and fragmented, especially in public universities. The Centre for Entrepreneurship and ICT Directorate at FUD present an enormous opportunity to address student unemployment, generate institutional revenue, and promote sustainable practices such as waste recycling. Unfortunately, these centers are currently limited in scope and under-performing due to poor planning, lack of innovation, and absence of a long-term strategic framework. Sustainable campus initiatives such as upcycling waste paper into tissue or converting plastic bottles into resaleable items not only support the environment but also create entrepreneurial opportunities for students. Similarly, ICT centers in leading global universities offer certification courses that attract both internal and external participants. This research proposes to reposition these units at FUD as models of institutional innovation and student empowerment.

To achieve this, Nigerian universities must begin to look inward and harness their existing resources. Strategic management of university-based entrepreneurship and ICT centers can enhance financial sustainability, create job opportunities for students, and address institutional deficits. Initiatives such as student-led recycling programs (e.g., converting paper waste to tissue or plastics into reusable materials), business incubation, and certified ICT training can be integrated into the institutional development strategy of universities like FUD.

As mentioned earlier, universities have evolved into innovation hubs that integrate teaching, research, and enterprise development to enhance institutional sustainability and student employability (Etzkowitz & Zhou, 2022; University of Oxford Innovation, 2023). In contrast, Nigerian public universities remain predominantly dependent on federal allocations, which are increasingly inadequate due to government austerity measures, such as the proposed 40% deduction from Internally Generated Revenue (BusinessDay, 2023; Punch, 2023). Similar evidence from Nigerian tertiary hospitals demonstrates that institutional management practices significantly influence internally generated revenue, highlighting the importance of efficient governance in public-sector organisations (Babi et al., 2026). Sustainable financing

remains essential for improving access to quality higher education and institutional performance in developing countries (Etudaiye-Muhtar & Aliyu, 2026). Consequently, many institutions struggle to maintain basic infrastructure, let alone invest in revenue-generating or student-empowering initiatives (Osodeke, 2024).

At Federal University Dutse (FUD), the Centre for Entrepreneurship and the ICT Directorate present untapped opportunities for addressing these challenges through strategic innovation. However, despite their potential, both centers operate in isolation and lack a coordinated, long-term vision. The Entrepreneurship Centre is largely dormant, with minimal production activities and weak industry linkages, while the ICT Directorate is narrowly focused on computer-based testing, with no structured program for ICT certifications, digital skills training, or technology commercialization. This siloed and reactive approach undermines the potential of these centers to drive innovation, generate revenue, and enhance student employability.

Moreover, valuable campus resources such as used examination scripts, paper offcuts, and plastic bottles are discarded rather than repurposed through sustainable practices like recycling or green entrepreneurship. While universities such as Covenant University and Ahmadu Bello University have successfully implemented eco-enterprise initiatives and ICT certification programs to engage students and generate income, FUD has yet to operationalize similar models (Yusuf et al., 2023; African Centre of Excellence in Data Science, 2024).

This disconnect between institutional assets and strategic utilization reflects a broader systemic issue: the absence of an evidence-based, context-specific framework to reposition university centers as engines of innovation and economic resilience. Without deliberate efforts to revitalize and strategically manage these units, FUD will continue to miss opportunities to create jobs, improve student outcomes, and reduce its overreliance on government subvention. Therefore, this study seeks to develop a strategic roadmap for transforming the Centre for Entrepreneurship and ICT Directorate at FUD into sustainable, student-centered, and innovation-driven hubs that contribute meaningfully to institutional revenue and national development goals. This study, therefore, investigates how the strategic revitalization and management of the Centre for Entrepreneurship and the ICT Directorate at Federal University Dutse can serve as a model for institutional innovation, revenue generation, and student employability in Nigeria's public university system.

2. Literature review

Strategic Management of University Entrepreneurship and ICT Centers

Contemporary empirical evidence suggests that strategic management has become the cornerstone for transforming traditional universities into entrepreneurial institutions capable of driving innovation, generating alternative revenue streams, and enhancing student employability. Across different geographical contexts, researchers consistently argue that entrepreneurial universities achieve superior institutional performance when entrepreneurship and innovation activities are guided by coherent strategic management frameworks rather than isolated initiatives.

For instance, Olesnevych (2025) developed a typology and strategic management algorithm for transforming higher education institutions into entrepreneurial universities and found that long-term planning, stakeholder integration, innovation governance, and continuous performance evaluation are fundamental to institutional transformation. Similar conclusions were reached by Nikolaev et al. (2023), whose case study of Moscow Polytechnic University demonstrated that strategic leadership, institutional

commitment, and university-industry collaboration significantly strengthen entrepreneurial activities while promoting regional development through startup incubation and knowledge transfer. Likewise, Guerrero et al. (2024) established that universities operating within integrated entrepreneurial ecosystems achieve higher innovation outputs and commercialization success because strategic collaboration among universities, governments, industries, and investors creates a supportive innovation environment.

The operational dimension of strategic management has also received considerable empirical attention. Harun et al. (2024a) developed the ICCubeX structured incubation model and demonstrated that structured incubation systems substantially improve technology commercialization, startup survival, and laboratory-to-market transition. Complementing this finding, Ye (2024) showed that successful entrepreneurship incubators rely on coordinated business models that integrate stakeholder partnerships, diversified funding, entrepreneurship education, and innovation support services. Together, these studies suggest that effective strategic management extends beyond institutional planning to encompass governance mechanisms, incubation systems, stakeholder collaboration, and commercialization strategies that collectively enhance entrepreneurial performance. Nevertheless, although these studies provide robust international evidence, they largely focus on developed or emerging economies and pay limited attention to how strategic management simultaneously influences innovation, revenue generation, and student employability within entrepreneurship and ICT centers in Nigerian federal universities.

Innovation Development through Entrepreneurship and ICT Centers

Innovation remains the central outcome expected from university entrepreneurship and ICT centers, with recent empirical studies emphasizing the importance of incubation, venture creation, digital technologies, and entrepreneurial ecosystems in fostering innovation performance. Although researchers adopt different methodological approaches, there is broad consensus that strategically managed entrepreneurship centers significantly improve knowledge commercialization and entrepreneurial success.

Alvarenga et al. (2023) found that venture-building strategies adopted by university acceleration programmes produce higher startup success rates than conventional incubation models because they provide intensive mentorship, market validation, product development, and investment readiness support. Similarly, Musleh et al. (2025) demonstrated that effective management of ICT resources, industry partnerships, and entrepreneurial support facilitates the commercialization of university-generated technologies through successful information technology spin-offs. More so, digital technologies have been shown to enhance enterprise performance through improved financial inclusion and innovation capabilities, particularly among SMEs in Nigeria (Usman et al., 2025). Consistent with these findings, Neto et al. (2025) reported that university innovation centers stimulate technology transfer, business incubation, knowledge commercialization, and regional economic development by strengthening collaborations with government agencies and private-sector organizations.

The importance of entrepreneurial ecosystems is further reinforced by Njolstad (2023), who found that innovation knowledge centers offering integrated entrepreneurial finance, mentorship, networking opportunities, and business advisory services outperform centers providing fragmented support services. Likewise, Zhao et al. (2025) demonstrated that entrepreneurial universities increasingly utilize digital technologies, virtual incubation platforms, online mentoring systems, and ICT-enabled entrepreneurship services to expand innovation opportunities for students and researchers. Collectively,

these studies indicate that successful innovation ecosystems require integrated entrepreneurial support systems combining incubation, digital technologies, financing mechanisms, mentorship, and strategic partnerships. However, despite this growing body of evidence, limited empirical research has examined how entrepreneurship and ICT centers within Nigerian universities strategically integrate these innovation components to achieve institutional objectives.

Concept of ICT Infrastructure and Innovation Ecosystems

Recent empirical studies consistently identify ICT infrastructure as a strategic resource underpinning entrepreneurship development and innovation ecosystems within higher education institutions. Rather than serving merely as technological support, ICT infrastructure enables collaboration, resource optimization, entrepreneurial networking, and digital business development.

Using evidence from the University of Dar es Salaam ICT Innovation Hub, Zahoro et al. (2024) found that business support services—including ICT infrastructure, mentoring, networking opportunities, and business advisory services—significantly improve entrepreneurial performance, revenue growth, customer acquisition, and business sustainability. Similarly, Rosienkiewicz et al. (2024) demonstrated that digital innovation platforms facilitate international collaboration, knowledge exchange, startup commercialization, and technology-focused entrepreneurship across universities participating in international innovation projects. Complementing these findings, Digital Technologies as a Catalyst for the Transformation of Academic Entrepreneurship (2024) established that digital transformation enhances entrepreneurial networking, resource allocation, institutional monitoring, and innovation management, although successful implementation requires strategic planning, staff capacity development, and institutional commitment.

Taken together, these studies indicate that ICT infrastructure constitutes a strategic capability that strengthens entrepreneurship ecosystems by improving communication, collaboration, commercialization, and entrepreneurial support. Nevertheless, there remains limited empirical evidence regarding how Nigerian university entrepreneurship and ICT centers strategically deploy digital infrastructure to support innovation, revenue generation, and employability outcomes.

Revenue Generation through University Entrepreneurship Centers

The declining reliance on government funding has prompted universities worldwide to pursue entrepreneurship centers as mechanisms for financial sustainability and revenue diversification. Empirical studies consistently show that strategically managed entrepreneurship centers contribute significantly to institutional income generation through commercialization activities and industry engagement.

Sari et al. (2025) demonstrated that universities adopting diversified revenue portfolios—including consultancy services, technology licensing, startup equity participation, commercialization, and professional training—achieve greater financial resilience than institutions relying primarily on academic revenue. Similarly, Cruz et al. (2023) found that the Entrepreneurship and Business Development Coordination Unit at the University of Brasília substantially contributed to institutional innovation policy implementation through startup support, technology transfer, commercialization, and industry collaboration despite disruptions caused by the COVID-19 pandemic. In a broader analysis of entrepreneurship promotion strategies, Proença (2025) concluded that financially sustainable entrepreneurship centers successfully combine consultancy services, innovation grants, incubation

programmes, industrial partnerships, facility utilization, and technology licensing into integrated revenue generation models.

Overall, these empirical findings suggest that entrepreneurship centers become financially sustainable when strategic governance structures effectively integrate commercialization, consultancy, innovation services, and external partnerships. However, evidence regarding revenue-generation models adopted by entrepreneurship and ICT centers within Nigerian public universities remains limited, thereby justifying further investigation.

Entrepreneurship Education and Student Employability

student employability has emerged as one of the most important performance indicators of university entrepreneurship centers. Recent empirical evidence consistently supports the positive influence of entrepreneurship education on employability, entrepreneurial intention, business creation, and workplace readiness.

Evidence from Nigerian universities demonstrates that entrepreneurship education significantly improves students' employability competencies. A survey involving 475 Business Administration students at the University of Uyo found that entrepreneurship education enhanced critical thinking, communication skills, problem-solving abilities, and self-employment competencies, although inadequate facilities and insufficient practical orientation constrained programme effectiveness (Entrepreneurship Education and Acquisition of Employability Skills Among Business Administration Students of University of Uyo, 2024). Similarly, Giami et al. (2024) showed that experiential learning, project-based instruction, industry mentorship, and business incubation significantly improve student employability in Nigerian tertiary institutions. Chika et al. (2024) further established that entrepreneurship education positively correlates with poststudent employability, employment rates, entrepreneurial engagement, and income generation.

Complementing these findings, Egbeji et al. (2026) argued that curriculum relevance, industry partnerships, practical learning opportunities, and career guidance constitute essential determinants of employability skills development in Nigerian universities. Likewise, Pitan et al. (2023), using evidence from Nigeria and South Africa, found that entrepreneurship education, digital literacy, soft skills development, and work-integrated learning prepare graduates for increasingly disruptive labour markets. Supporting the mechanism underlying these relationships, Edokpolor et al. (2023) demonstrated through structural equation modelling that entrepreneurial knowledge and skills acquisition mediate the relationship between entrepreneurship education and students' intentions to establish businesses.

From a broader national perspective, Ajadi (2023) observed that despite rising university enrolment in Nigeria, graduate unemployment remains persistently high, underscoring the need for entrepreneurship-oriented education. Similarly, Iwara (2025) argued that rural-based entrepreneurial universities can significantly improve student employability by aligning entrepreneurship programmes with local economic development priorities. Adamu et al. (2023) further established that supportive government policies strengthen the relationship between entrepreneurship education and business start-up among undergraduates, while Ojule et al. (2024) concluded that effective management of entrepreneurial education through dedicated entrepreneurship centers substantially improves student employability in competitive labour markets.

Overall, the empirical evidence consistently demonstrates that entrepreneurship education enhances employability by developing entrepreneurial knowledge, practical competencies, digital capabilities, and business creation intentions. However, existing studies have largely examined entrepreneurship education, innovation, revenue generation, and employability as separate phenomena. Very few have integrated these variables within a single strategic management framework focusing on the management of a university Center for Entrepreneurship and ICT. Furthermore, there is a notable absence of empirical evidence from Federal University Dutse and similar Nigerian federal universities. Consequently, this study seeks to bridge this gap by examining how the strategic management of the Center for Entrepreneurship and ICT influences innovation, revenue generation, and student employability within the context of Federal University Dutse.

Research Hypotheses

Based on the theoretical arguments and empirical evidence reviewed, the study proposed the following hypotheses:

H1: Strategic management practices (strategic planning, resource allocation, stakeholder engagement, and monitoring and evaluation) have a significant positive effect on revenue generation at the Entrepreneurship Centre and ICT Directorate of Federal University Dutse.

H2: Strategic management practices (strategic planning, resource allocation, stakeholder engagement, and monitoring and evaluation) have a significant positive effect on innovation output at the Entrepreneurship Centre and ICT Directorate of Federal University Dutse.

H3: Strategic management practices (strategic planning, resource allocation, stakeholder engagement, and monitoring and evaluation) have a significant positive effect on student employability at the Entrepreneurship Centre and ICT Directorate of Federal University Dutse.

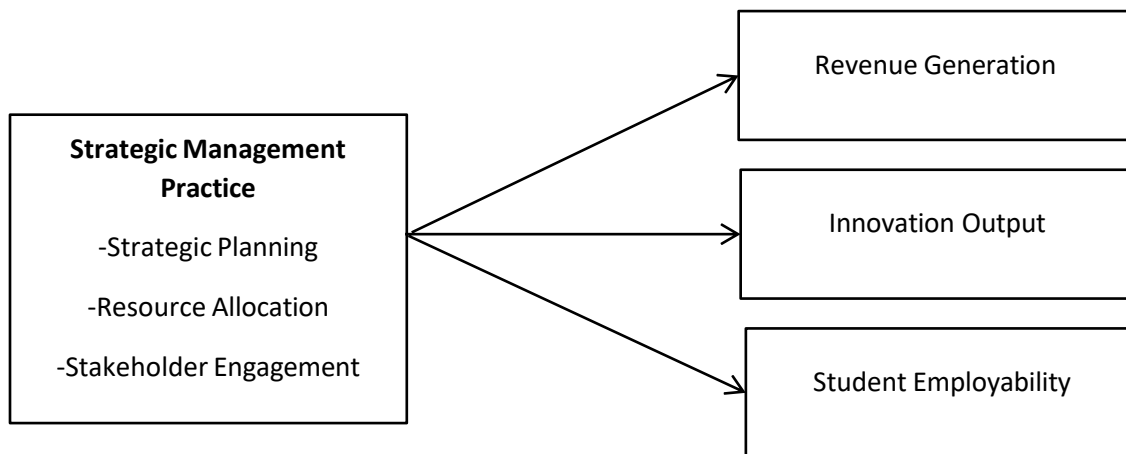


Figure 1: Conceptual Framework

2.2. Theoretical Framework

Resource-Based View (RBV)

The Resource-Based View (RBV) of the firm, first articulated by Barney (1991), is a strategic management theory that emphasizes the internal resources of an organization as the key to achieving and sustaining a competitive advantage. According to the RBV, organizations should focus not merely on external market conditions, but on developing and deploying valuable, rare, inimitable, and non-substitutable

(VRIN) resources. These resources can be tangible—such as land, facilities, and technology—or intangible, such as knowledge, organizational culture, intellectual property, and human capital.

Applied to the context of Federal University Dutse (FUD), the RBV provides a compelling theoretical lens through which to understand how the university can strategically manage its Centre for Entrepreneurship and ICT to generate innovation, boost revenue, and enhance student employability. For instance, FUD possesses several underutilized or dormant internal resources, including unused physical spaces, discarded or recyclable materials, computing infrastructure, and perhaps most critically, student creativity and entrepreneurial potential.

From the RBV perspective, these assets can be transformed into strategic advantages if the university adopts a proactive, internally-driven approach. Empty classrooms or office spaces can be converted into innovation labs, co-working hubs, or business incubation centers. Waste materials from academic or administrative operations can be reused for eco-friendly production training or student-led sustainability projects. Computing infrastructure, when integrated with entrepreneurial training, can support tech startups, e-commerce training, or digital content creation programs. Most importantly, by harnessing the creative and intellectual capital of students, the Centre can foster student-led ventures, thus aligning academic knowledge with practical entrepreneurship.

In essence, the RBV suggests that sustainable impact will come not from mimicking what other institutions are doing, but from leveraging what FUD uniquely has. By strategically managing its internal resources, the university can reposition the Centre for Entrepreneurship and ICT as a driver of institutional growth, innovation, and long-term value creation for both students and the broader community.

3. Methodology

This study adopted a pragmatic research paradigm using a convergent parallel mixed-methods design within a single embedded case study. Federal University Dutse (FUD), Nigeria, served as the primary case, while the Entrepreneurship Centre and ICT Directorate constituted the embedded units of analysis. The design enabled the integration of quantitative and qualitative evidence to examine strategic management practices and develop a framework for improving innovation, revenue generation, and student employability.

The study population comprised students, staff of the Entrepreneurship Centre and ICT Directorate, and external stakeholders. A total of 240 respondents participated in the quantitative survey, consisting of 200 students selected through stratified random sampling, 30 staff purposively selected from the two units, and 10 external stakeholders recruited using snowball sampling. The multi-source sampling strategy enhanced data triangulation.

Primary data were collected between October 2025 and February 2026 using a structured questionnaire, semi-structured interviews, and focus group discussions. The questionnaire employed a five-point Likert scale to measure strategic planning, resource allocation, stakeholder engagement, monitoring and evaluation, revenue generation, innovation output, and student employability. All measurement scales demonstrated acceptable internal consistency, with Cronbach's alpha coefficients exceeding 0.80. Ethical approval was obtained from the Federal University Dutse Institutional Review Board, and informed consent was obtained from all participants.

Quantitative data were analysed using Ordinary Least Squares (OLS) regression to examine the effects of strategic planning, resource allocation, stakeholder engagement, and monitoring and evaluation on revenue generation, innovation output, and student employability. Diagnostic tests confirmed that the assumptions of multiple linear regression, including linearity, normality, homoscedasticity, and absence of multicollinearity ($VIF < 5$), were satisfied. Qualitative data were analysed using Braun and Clarke's (2006) thematic analysis, combining inductive and deductive coding guided by Institutional Theory and the Resource-Based View. Finally, quantitative and qualitative findings were integrated using joint display analysis to identify areas of convergence, complementarity, and divergence.

4. Results and discussion

Respondents' Demographic Characteristics

Table 1. Demographic Profile of Respondents (N = 240)

Variable	Category	Frequency	Percentage (%)
Gender	Male	154	64.2
	Female	86	35.8
Respondent Category	Students	200	83.3
	Entrepreneurship Centre Staff	15	6.3
	ICT Directorate Staff	15	6.3
	External Stakeholders	10	4.2
Year of Study*	Year 1	45	18.8
	Year 2	47	19.6
	Year 3	31	12.9
	Year 4	30	12.5
	Year 5	47	19.6
	Staff/External (Not Applicable)	40	16.7

*Applicable only to student respondents.

Source: Researcher, 2026

Table 1 above presents the demographic profile of the respondents. Of the 240 participants, 64.2% were male and 35.8% were female. Students constituted the majority of the sample (83.3%), while Entrepreneurship Centre staff, ICT Directorate staff, and external stakeholders accounted for 6.3%, 6.3%, and 4.2%, respectively. Student respondents were drawn from all academic levels, with Year Two and Year Five students representing the largest proportions (19.6% each).

Table 2. Descriptive Statistics of the Main Study Variables (N = 240)

Variable	Mean	Std. Dev.	Minimum	Maximum
Strategic Planning	3.775	0.955	1	5
Resource Allocation	2.833	1.034	1	5
Stakeholder Engagement	3.454	0.993	1	5
Monitoring and Evaluation	3.092	1.075	1	5
Revenue Generation	2.721	1.040	1	5
Innovation Output	3.283	0.987	1	5
student employability	3.704	0.942	1	5

Source: Researcher, 2026

As shown in Table 2 above, Strategic Planning recorded the highest mean score ($M = 3.78$, $SD = 0.96$), followed by student employability ($M = 3.70$, $SD = 0.94$). Resource Allocation ($M = 2.83$, $SD = 1.03$) and

Revenue Generation (M = 2.72, SD = 1.04) had the lowest mean scores, suggesting respondents perceived these areas as relatively weaker.

Table 3: OLS Regression Results

Variable	Revenue Generation	Innovation Output	student employability
Strategic Planning	0.116 (0.071)	-0.019 (0.067)	-0.029 (0.065)
Resource Allocation	-0.084 (0.066)	0.043 (0.063)	0.025 (0.061)
Stakeholder Engagement	-0.105 (0.068)	-0.042 (0.065)	0.064 (0.062)
Monitoring & Evaluation	-0.053 (0.064)	-0.044 (0.061)	-0.036 (0.058)
Observations	240	240	240
R²	0.042	0.018	0.022
Adjusted R²	0.021	-0.004	0.000

*Notes: Dependent variables are composite scores based on 5-point Likert scales. Reference category is "Student". Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. No coefficients are statistically significant at conventional levels.*

Table 3 presents the Ordinary Least Squares (OLS) regression results examining the influence of strategic management practices on revenue generation, innovation output, and student employability at the Entrepreneurship Centre and ICT Directorate of Federal University Dutse. Overall, none of the four strategic management practices—strategic planning, resource allocation, stakeholder engagement, and monitoring and evaluation—had a statistically significant effect on any of the three performance outcomes ($p > 0.10$). Similarly, the models exhibited low explanatory power, with R^2 values ranging from 0.018 to 0.042, indicating that only a small proportion of the variation in the dependent variables was explained by the predictors included in the models.

Strategic planning recorded a positive but insignificant coefficient for revenue generation ($\beta = 0.116$, $p > 0.10$) and negative insignificant coefficients for innovation output ($\beta = -0.019$, $p > 0.10$) and student employability ($\beta = -0.029$, $p > 0.10$). These findings suggest that although strategic planning mechanisms exist within the University, they have not translated into measurable improvements in organisational performance. This finding contrasts with those of Wright et al. (2017) and Guerrero et al. (2020), who reported that effective strategic planning significantly enhances university innovation, entrepreneurial performance, and graduate outcomes when supported by robust implementation mechanisms. The discrepancy may indicate that strategic plans at Federal University Dutse are inadequately implemented or insufficiently aligned with operational activities.

Resource allocation also failed to exert a significant influence on revenue generation ($\beta = -0.084$, $p > 0.10$), innovation output ($\beta = 0.043$, $p > 0.10$), or student employability ($\beta = 0.025$, $p > 0.10$). Although the coefficients were statistically insignificant, the findings imply that the available financial, technological, and human resources are not being effectively mobilised to achieve institutional objectives. This observation supports the Resource-Based View (Barney, 1991), which argues that organisational resources generate superior performance only when they possess valuable, rare, inimitable, and organisationally embedded (VRIO) characteristics. The findings are consistent with Wright et al. (2017) and Siegel and Wright (2015), who argued that the effective orchestration of resources, rather than mere

resource availability, is essential for achieving innovation and commercialisation within entrepreneurial universities.

Similarly, stakeholder engagement did not significantly influence revenue generation ($\beta = -0.105$, $p > 0.10$), innovation output ($\beta = -0.042$, $p > 0.10$), or student employability ($\beta = 0.064$, $p > 0.10$). Although collaboration with external stakeholders is widely recognised as a critical driver of entrepreneurial university performance, the present findings suggest that partnerships involving the Entrepreneurship Centre and ICT Directorate have not matured sufficiently to produce measurable institutional benefits. This finding differs from Guerrero et al. (2024), who found that strong collaboration among universities, industry, government, and investors significantly enhances innovation performance and entrepreneurial outcomes. The absence of significant effects may reflect weak industry linkages, limited external funding opportunities, and inadequate collaboration mechanisms within the University.

Monitoring and evaluation likewise exhibited insignificant relationships with revenue generation ($\beta = -0.053$, $p > 0.10$), innovation output ($\beta = -0.044$, $p > 0.10$), and student employability ($\beta = -0.036$, $p > 0.10$). This suggests that existing monitoring systems are not sufficiently effective in improving organisational learning, accountability, or strategic decision-making. Previous studies have shown that continuous monitoring and performance evaluation strengthen institutional effectiveness by facilitating evidence-based planning and continuous improvement. The present findings therefore indicate potential weaknesses in the University's performance management systems that limit the effectiveness of strategic initiatives.

The low explanatory power of the regression models ($R^2 = 0.018\text{--}0.042$) suggests that strategic management practices alone are insufficient to explain variations in revenue generation, innovation output, and student employability. This result is not unexpected given the multidimensional nature of university entrepreneurship ecosystems. Previous studies have demonstrated that university performance is influenced by a broad range of contextual factors, including governance quality, commercialisation capability, funding adequacy, institutional autonomy, external partnerships, policy support, and entrepreneurial culture (Proença, 2025; Sari et al., 2025). Consequently, the insignificant coefficients observed in this study may reflect the influence of omitted institutional and environmental variables beyond the strategic management practices examined.

The findings also provide empirical support for Institutional Theory (Scott, 2014). Although formal strategic management structures appear to exist within the Entrepreneurship Centre and ICT Directorate, their inability to influence organisational outcomes suggests weaknesses in the institutional environment that supports implementation. This pattern is consistent with the concept of institutional decoupling proposed by Meyer and Rowan (1977), whereby organisations adopt formal structures primarily to satisfy external regulatory or legitimacy requirements without fully integrating them into routine organisational practices. Similar implementation challenges have been reported in higher education institutions across sub-Saharan Africa, where bureaucratic constraints, resource limitations, and weak institutional capacity undermine the effectiveness of strategic initiatives (Eduro et al., 2023; Zavale et al., 2024).

Overall, the findings indicate that the mere existence of strategic planning, resource allocation mechanisms, stakeholder engagement initiatives, and monitoring systems is insufficient to improve the performance of the Entrepreneurship Centre and ICT Directorate at Federal University Dutse. Rather, institutional capacity, effective resource orchestration, stakeholder collaboration, governance quality,

and implementation capability appear to be the critical conditions through which strategic management practices can translate into improved revenue generation, innovation, and student employability. These findings highlight the need for the University to strengthen implementation processes, deepen external partnerships, improve resource utilisation, and institutionalise performance monitoring if its entrepreneurship and ICT centres are to fulfil their strategic mandates.

To address these shortcomings, a revised strategic management framework is proposed (see Figure 2). The framework adopts a three-phase approach:

Proposed Strategic Management Framework

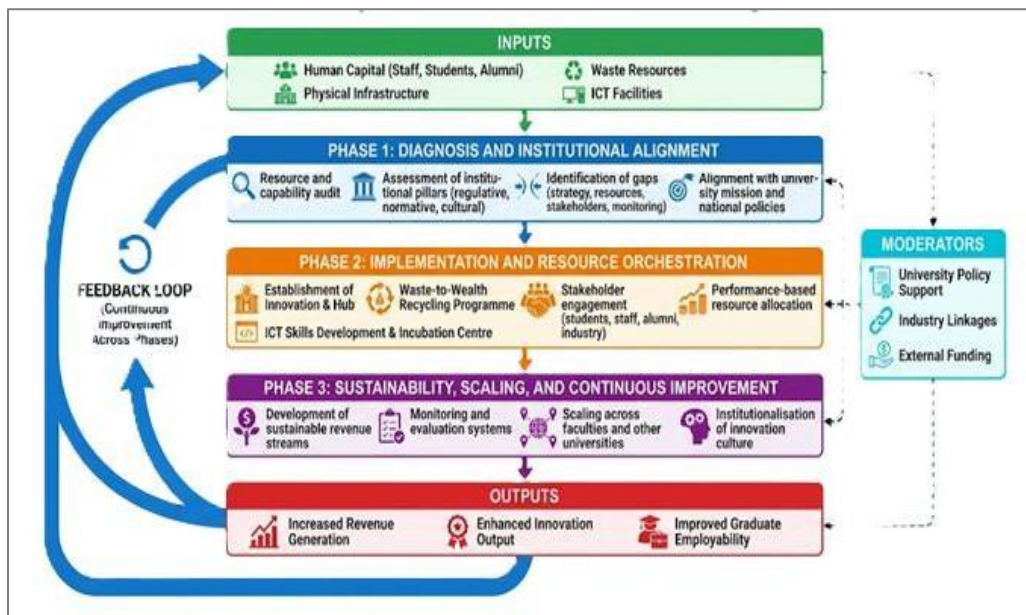


Figure 2: Proposed Strategic Management Framework for University Entrepreneurship and ICT Centres

Source: Developed by the authors based on empirical findings, Institutional Theory (Scott, 2014), and Resource-Based View (Barney, 1991).

As shown in Figure 2, the proposed strategic management framework in three phases aims to improve the state of the Entrepreneurship Centre and ICT Directorate at Federal University Dutse from their current state as "white elephants" to integrated and sustainable centres for revenue generation, innovation and student employability. This framework brings together Institutional Theory (Scott, 2014) and the Resource-Based View (Barney, 1991) to overcome the institutional gaps and underutilisation of resources observed in the empirical evidence.

The model consists of three sequential yet iterative phases:

Phase 1: Diagnosis and Institutional Alignment

1. Comprehensive audit of current resources, capabilities, and institutional pillars (regulative, normative, and cultural-cognitive).

2. Identification of gaps in strategic planning, resource allocation, stakeholder engagement, and monitoring systems.
3. Alignment of centre objectives with university mission and national higher education policy.

Phase 2: Implementation and Resource Orchestration

1. Establishment of a unified Innovation and Enterprise Hub merging the Entrepreneurship Centre and ICT Directorate.
2. Launch of two flagship enterprises: (i) a campus-wide waste-to-wealth recycling programme and (ii) an industry-certified ICT skills and incubation centre.
3. Active stakeholder engagement (students, staff, alumni, and industry partners) and performance-based resource allocation.

Phase 3: Sustainability, Scaling, and Continuous Improvement

1. Development of sustainable revenue streams and performance monitoring systems.
2. Scaling successful initiatives across other faculties and Nigerian public universities.
3. Institutionalisation of a culture of innovation and entrepreneurship through policy reinforcement and regular evaluation.

Inputs: Existing university resources (human capital, physical infrastructure, waste, ICT facilities). Processes: Strategic management practices (planning, resource allocation, stakeholder engagement, monitoring). Outputs: Increased revenue generation, enhanced innovation output, and improved student employability. Moderators: Policy support from university management, industry linkages, and external funding.

5. Conclusion

This study examined the strategic management of the Centre for Entrepreneurship and ICT at Federal University Dutse and its influence on innovation, revenue generation, and student employability. The findings revealed that the current strategic management practices have no statistically significant effect on the three performance outcomes. The regression models explained only a small proportion of the variation in the dependent variables, with R^2 values ranging from 0.018 to 0.042, while all strategic management dimensions recorded non-significant regression coefficients ($p > 0.05$). These results indicate that although strategic management structures exist within the Centre, they have not yet translated into measurable improvements in innovation output, internally generated revenue, or student employability.

Based on these findings, the study concludes that strengthening the implementation of strategic management practices is essential for improving the performance of entrepreneurship and ICT centres in Nigerian public universities. It recommends the integration of the Entrepreneurship Centre and ICT Directorate into a unified Innovation and Enterprise Hub capable of supporting entrepreneurship development, digital skills acquisition, technology incubation, and sustainable revenue generation. Although the study is limited to a single case study and cross-sectional data, it provides a practical

framework for institutional improvement and offers a basis for future comparative and longitudinal studies across Nigerian universities.

Business Model Canvas for FUD Waste-to-Wealth + ICT Innovation Hub



Figure 3: Business Model Canvas for FUD Waste-to-Wealth + ICT Innovation Hub

Source: Developed by the authors based on empirical findings and the proposed strategic framework (Figure 2).

The Business Model Canvas shown in Figure 3 offers a guide to operationalise the proposed Innovation and Enterprise Hub. The hub integrates waste-to-wealth recycling with ICT skills training and incubation to generate multiple streams of revenue while solving two problems: waste management and employability of graduates.

The model uses university resources (waste and ICT) as inputs to create value through different processes. The model anticipates generating revenues from the sale of recycled products, certification and incubation. This holistic approach is anticipated to minimise the centres' dependency on university subsidies and lead to a sustainable model. The canvas also shows the need for close collaboration with industry and alumni, which will be vital for expanding the hub and ensuring that the skills and products produced are relevant to the market.

Policy Recommendations

To facilitate the effective implementation of the proposed framework across Nigerian public universities, the National Universities Commission (NUC) should adopt performance-based funding mechanisms that reward institutions for generating internal revenue through Entrepreneurship and ICT Centres rather than relying solely on government subventions. In addition, the Federal and State Governments should establish a dedicated Innovation and Entrepreneurship Fund to support entrepreneurial initiatives such as waste-to-wealth projects, ICT certification programmes, and technology commercialization. University Governing Councils should also be required to develop integrated

strategic plans that consolidate Entrepreneurship Centres and ICT Directorates into a unified Innovation and Enterprise Hub, thereby promoting institutional coordination, innovation, and sustainable revenue generation.

Furthermore, government policies should encourage stronger public-private partnerships by providing tax incentives to industries that collaborate with universities in areas such as skills development, business incubation, technology transfer, and recycling initiatives. The **Federal Ministry of Education** should incorporate student employability indicators and internally generated revenue targets into the accreditation criteria for Entrepreneurship and ICT Centres to strengthen accountability and performance. Finally, continuous capacity-building programmes should be funded to equip centre managers and staff with competencies in strategic management, resource orchestration, innovation management, and business model development, thereby enhancing the effectiveness and long-term sustainability of university entrepreneurship and ICT centres.

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