

ACADEMIC ENTREPRENEURIAL INNOVATIONS AND SUSTAINABILITY OF STATE-OWNED UNIVERSITIES IN SOUTHWEST NIGERIA.

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ABSTRACT

The study examined the influence of academic entrepreneurial innovations on sustainability of state-owned universities in Southwest Nigeria. Three research questions guided the study. A correlational research design was used. The population of the study comprised 3,536 lecturers from nine state-owned old universities in Southwest Nigeria. A sample size of 616 lecturers from three of the universities using purposive and proportionate sampling techniques. Researcher-developed instrument titled Academic Entrepreneurial Innovations Questionnaire (AEIQ) was used for data collection. The instrument was divided into two sections and validated by three experts. The instrument reliability was assessed with Cronbach Alpha. In this instance, copies of the AEIQ were given to 30 ESUST academic members. The instrument reliability coefficient was reported as ($r = .90$). The sustainability of the universities was measured using the universities' average revenue. Pearson Product Moment Correlation (PPMC) was used to answer to the research questions at a 0.05 level of significance. The findings of the study indicated that there was significant relationship between collaborative research initiatives ($r = .589, p < .05$), sale of research outputs ($r = .682, p < .05$), technical inventions ($r = .357, p < .05$) and sustainability of state-owned universities. Based on the findings, it was concluded that collaborative research initiatives with industry, and technical inventions based on research outputs could enhance the sustainability of the state universities in Southwest Nigeria. Consequently, it was recommended among others that state universities need to embrace academic entrepreneurial innovations through research outputs and commercialisation of intellectual ideas for product development within the industry.

KEYWORDS: Academic entrepreneurial innovations, collaborative research initiatives, sale of research outputs, technical inventions, university sustainability

INTRODUCTION

What makes a university sustainable is its ability to earn money and conduct research that is capable of addressing modern social and industrial concerns. It means doing everything required to keep the system's finances stable without forgoing other important duties. Since inadequate financing is a major problem that undermines the efficacy of education in Nigeria's public institutions, university sustainability might be a solution to the problem. In the pursuit of sustainability, state-owned universities must embrace creative techniques such as acquiring long-term funding streams and decreasing dependency on government subsidies which essential to the long-term viability of higher education institutions. The term sustainable financial resources describe a university's ability to meet all of its financial commitment without depending exclusively on grants and loans from the government. According to Odewole, Olowookere, and Oladejo (2021), university sustainability is the ability of the institution to discharge its daily financial responsibilities and lawful and statutory demands without depending on outside funding sources or outside influence to survive. To get a competitive financial advantage, university sustainability primarily addresses two fronts: broadening the organisational resource baseline of a business or extending the financial boundaries of the entity (Odewole *et al.*, 2021).

University sustainability strives to generate enough revenue internally within operating parameters, expand its revenue source, and broaden its area of expertise to cover all of its costs without the need for outside funding (Hahn & Figge, 2022). One important factor in determining a university's financial standing is its sustainability (Nalwoga, 2021). University sustainability is a crucial factor to consider when assessing a university's financial standing. Liquidity, solvency, and operational sustainability are typical metrics used to assess a university's sustainability (Sami & Sree, 2022). The capacity of the institution to earn revenue from creativity and novel innovations from the academic staff through their research outputs was how Ahmet and Premaj (2022) measured university sustainability by the capacity to earn revenue from creativity and novel innovations from the academic staff through their research outputs ~~was how~~, while Sazonov, Kharlamova, Chekhovskaya, and Polyanskaya (2020) measured it using dimensions of net operating results, income diversification, liquidity, and solvency or leverage. Alabi, Ojebode and Abdulkareem (2023); Adebayo, Essang and Osime (2022) as well as Carlo, Modugno, Agasisti and Catalano (2023) in their separate studies used university average revenue to measure sustainability of university which was adapted by this study. According to these authors, university average revenue is the addition of school fee consultancy services and government subventions.

In order to close budgetary gaps, universities across the globe are forced to adopt cost-cutting and revenue-enhancement strategies in order to reach sustainability. This is possible when they start to expand their access to financial resources through consistent revenue (Ayam, 2021). Public universities across the world, but particularly in Africa, seem to be under assault right now from a number of fronts. For example, underfunding by the government, heightened rivalry, and the need of pursuing higher education are some of the variables influencing the sustainability of universities (Ivonne, 2020). A major challenge confronting public university in Africa in

contemporary times is sustainability, which is jeopardised by reductions in government subvention and society's rising request for higher-quality and more abundant services (Carlo *et al.*, 2023).

Underfunding, which is a direct result of the government's lackadaisical attitude towards tertiary education, substantially limits the effectiveness of university education in Nigeria (Ndubuisi-Okolo & Dibua, 2023). To achieve sustainability, public universities in Nigeria are starting to turn inward. Through academic entrepreneurial innovations (Hahn & Figge, 2022). Odewole *et al.*, (2021) posited that university sustainability could be achieved through these innovations in addition to having the ability to commercialize educational research and development outcomes. The combination of intellectual capacity and entrepreneurship may help universities generate new ideas via academic entrepreneurial innovation (Dada, Obamuyi & Jesuleye, 2021). It may even be seen as data fabrication that bypasses intellectual and entrepreneurial players. According to Dada and Oyeibisi (2016), academic entrepreneurial innovation is the proficiency of universities at commercializing their best research and development goods, which include transforming intellectual effort and knowledge into products that will meet consumer and industry demands.

According to the William Davidson Institute (2018), academic entrepreneurial innovations are university arrangements and the process of developing economic concepts and value via the renewal of research outputs, the technical benefit and massive commercialization. This may be accomplished by fostering productive and friendly relationships between the academic system and business sectors for the advancement and mutual benefit of commercialization. This implies that, via creating value for the market, academic entrepreneurial innovations may improve institutions' sustainability. In other words, university leadership need to support academic entrepreneurial behaviours and activities. Dada *et al.*, 2021; Akinwale, Dada, Oluwadare, Jesuleye and Siyanbola, 2019; Dada and Oyeibisi, (2016) asserted that university research includes the ready-made stock value of intellectual information that would serve as value and advantages for human requirements. This assertion has been validated by data from both industrialized and developing countries. For instance, universities like Hebrew University of Israel, Cambridge University in the United Kingdom (UK), and the Industrial Technology Research Institute in Taiwan have recognised the value of academic entrepreneurial innovations for university sustainability and have directed their intellectual resources towards the creation of new value and improved economic performance of significant economic sectors. This is to say that given enough other factors, university sustainability in Nigeria is achievable via concept innovation, technological tool development, and the adoption of flexible methods that would promote the commercialisation of research and development outputs (Dada *et al.*, 2021).

Based on the knowledge and experience of present researchers, the university sustainability in Nigeria may only exist in theory without a strong institutional leadership vision and purpose in addition to the backing of governmental policy. One of the things that seem to stimulate university technology transfer to businesses is the institution's capacity to maintain value generation, which may lead to innovations and further encourage academic entrepreneurial growth via research commercialisation (Adebayo *et al.*, 2022). However, Carlo *et al.*, (2023) and Sami and Sree (2022) in their separate studies concluded that factors such as sales of research outputs, technical inventions and collaborative research initiatives were among the

academic entrepreneurial innovations variables that institutions can commercialized with the industry to generate additional revenue. Sales of research outputs relate to the institutions capability to commercialised novel ideas and innovation of research conducted in the system with the industry. Technical inventions are more of a university's ability coupled with the skills and knowledge of its academic staff to develop new methods of resolving industrial issues like new technological software, a novel idea of production, selecting from alternative materials for greater productivity. Collaborative research initiatives by the university refer to the cordial association with the industry to bring out new products and services to the market for mutual benefits.

STATEMENT OF THE PROBLEM

Nigeria's state government-owned universities are dealing with several financial issues' such as a lacklustre income diversification strategy, low revenue, insufficient government support, and low internally generated income (IGR). These issues have shown up in several ways, including staff members not receiving their full salary, unpaid promotion arrears, sharp drops in departmental operating costs, inadequate supplies of stationery for all university units, and many more. It is a known fact that no organisation can achieve sustainability if it does not generate enough income to run the system efficiently. Because of this, the issue of insufficient finance has negatively impacted university education, particularly in the areas of research, ~~the~~ supply of infrastructure, and instructional activities. As a result, it seems that the institutions' output is not sufficiently ready and equipped for national development.

This problem of this study is the persistent absence of a long-term funding source for tertiary institution in Nigeria, which jeopardises the nation's progress toward high-quality university education. This contributes to the delays in payment of salaries of lecturers and others employees of state-owned universities causing to go on strike several times, which negatively impacts both the quality of education provided by these institutions and their viability in the nation. The Tertiary Education Trust Fund (TETFund), increased tuition for students, and the introduction of various levies are just a few of the actions that governments have taken to address these issues. Despite these steps, most state government-owned universities in Nigeria are still unable to attain sustainability. Finding solution to this ugly situation informed this study on the relationship between academic entrepreneurial innovations and sustainability of state-owned universities in South-West Nigeria to provide relevant empirical data for objective measures by relevant stakeholders.

Objectives of the Study

The main objective of the study was to determine the relationship between academic entrepreneurial innovations and sustainability of state-owned universities in South-West Nigeria. Specifically, the study determined the:

1. Relationship between academic entrepreneurial innovations (sale of research and development (R&D) outputs) and sustainability of state-owned universities in Southwest Nigeria;

2. Relationship between academic entrepreneurial innovations (collaborative research initiatives with industries) and sustainability of state-owned universities in Southwest Nigeria;
3. Relationship between academic entrepreneurial innovations (technical inventions based on research results) and sustainability of state-owned universities in Southwest Nigeria.

RESEARCH QUESTIONS

This study answered the following research questions:

1. To what extent do sale of research and development (R&D) outputs and sustainability are related in state-owned universities in South-West Nigeria?
2. What is the relationship between collaborative research initiatives with industries and sustainability of state-owned universities in Southwest Nigeria?
3. Would there be any relationship between technical inventions based on research results and sustainability of state-owned universities in Southwest Nigeria?

LITERATURE REVIEW

Since entrepreneurial innovations are noticeable and share characteristics with many aspects of the modern economy, they are not new in the industrialised world. Around the globe, there are several instances of prosperous economies implementing excellent projects. Governments all throughout the world acknowledge that entrepreneurial innovation has the ability to spur growth and innovation (Abdulazeez, Issa & Yusuf, 2019). According to Ogundele and Ijiya (2017), entrepreneurial innovations are focused, actionable initiatives that are implemented to achieve certain goals shortly. These goals may include lower expenditure, more efficiency, and enhanced performance. When considering entrepreneurial innovations from an integrated perspective, businesses must be able to collaborate with people, clients, staff, the government, and regulatory agencies. This entails taking concrete measures (Sajuyigbe, Madu-Igwe & Unachukwu, 2016). Because there are so many possibilities in the environment, successful entrepreneurs pursue their core businesses. Entrepreneurial innovations including networking, technology adoption, business orientation, and teamwork are highlighted by Kusumawardhani, McCarthy, and Perera (2019) as crucial components of the company.

Academic entrepreneurship (AE), as defined by Ojo (2022), is the commercialisation of knowledge domain, including the conversion of data into goods and processes that will unavoidably support innovation and the economy. Transfer of academic knowledge, research product licencing, contract research, consultancy, research partnerships, knowledge transfer process, positioning of students, teaching, and continuous professional development are components of academic involvement in actions outside the typical functions of research, administration, and training. These activities can be formal or informal and include partnerships with organisations and industries, creation of new businesses, research output licensing, academic invention notifications to technology transfer offices, and academic knowledge transmission (Ojo *et al.*, 2022). Academic entrepreneurial (AE) endeavours facilitate the dissemination of information and the commercialisation of technology, and they have the potential to greatly impact the growth of the entrepreneurial ecosystem. Capability variables such as education, human capital, industrial experience, and entrepreneurial-related competencies highlight academic entrepreneurialism (Obamuyi, 2018).

Conceptual Framework

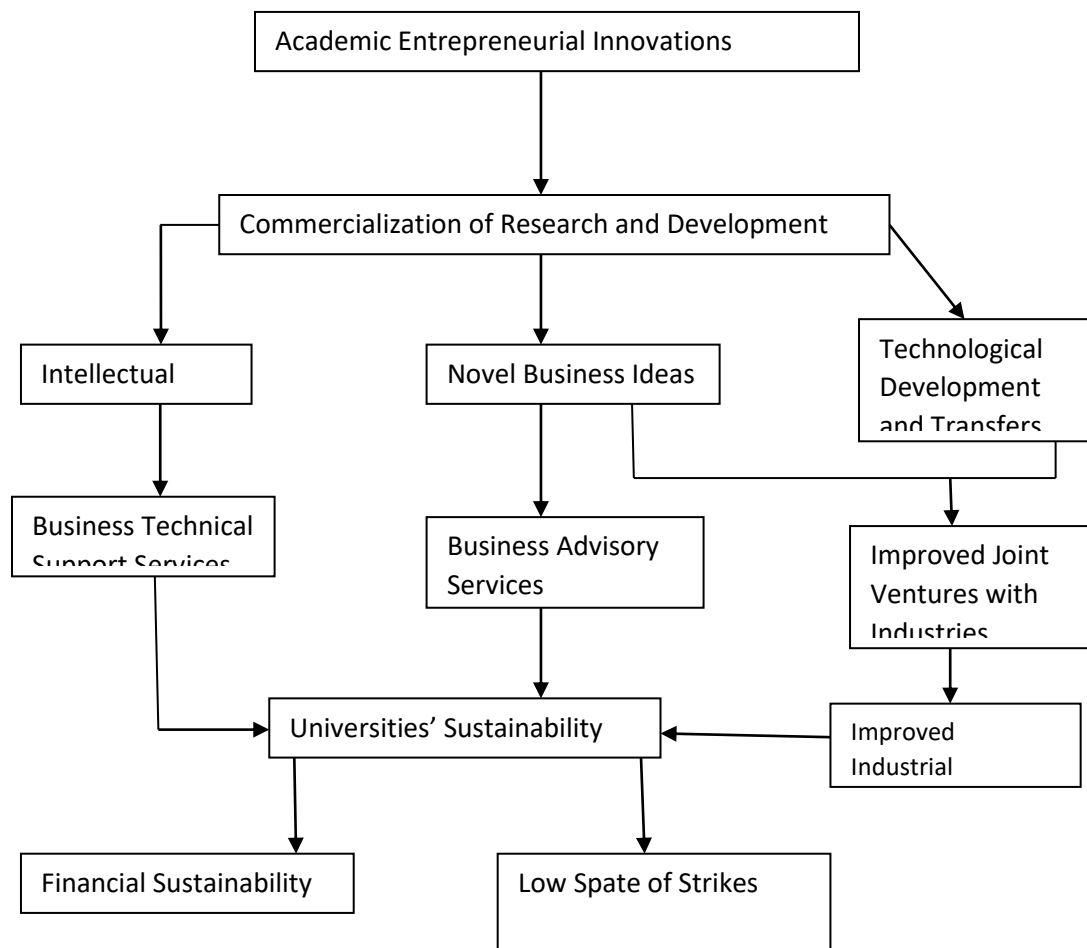


Figure 1: Academic Entrepreneurial Innovations Framework

Universities Sustainability

To be sustainable is to be able to survive without collapsing. Sustainability, according to Abdullahi (2021) and Sharma (2013), is the capacity of an institution to operate over an extended period of time without suffering a reduction in growth as a result of a shortage of essential resources. In many postsecondary institutions nowadays, sustainability is considered as one of the main issues (Njoki, 2016). Therefore, ensuring that tertiary institutions are ready to create adequate revenue through a long-term goal to enable them carry out their operations efficiently and invest in their academic and research activities without unduly depending on government funding is the primary goal of governance in these institutions. The current appalling economic condition of academic institutions in Nigeria mostly arose from their incapacity to balance their expenses and earnings (Abdullahi, 2021). Due to the rising expenses of post-secondary education, rising enrolment, and deteriorating economic circumstances, postsecondary institutions are not receiving enough outside money to effectively carry out their missions.

As a result, the organisation's biggest issue right now is the problem of maintaining university sustainability. For postsecondary educational institutions to determine whether learning programmes are viable over the long term, accurate and relevant models of sustainability are essential. Numerous studies are being carried out globally with the goal of resolving concerns related to financial sustainability in educational settings. The research by Driscoll, Clare, and Dennis (2013) is one of the well-known studies that made the case that five skills are necessary for education to be sustainable.

METHODOLOGY

A correlational research design was used for the study. A correlational study design examines associations between a minimum of two variables without altering any of them. This is in line with studies of Ivonne (2020) who examined the factors that affect university financial sustainability as well as Dorothea and Connie (2018) who looked into drives university academics to be entrepreneurial. These two studies used correlational design. Population of the study consists of 3,536 lecturers from nine state-owned universities in Southwest (SW) Nigeria that have existed for 10 years (Source: Establishments office of each university, 2023). The sample size of 616 lecturers was drawn using a multi-stage sampling technique involving purposive and proportionate sampling techniques. Hence, sample of the study was drawn from the three of the nine universities; Olabisi Onabanjo University, Ago-Iwoye, Ogun State, Ekiti State University, Ekiti State and Lagos State University, Lagos State.

A five-point rating scale questionnaire titled: “Academic Entrepreneurial Innovations Questionnaire (AEIQ)” containing three sections according to the research questions was used to collect data on the extent of academic entrepreneurial innovations at universities. The instrument was face and content validated by three experts two in Business Education and one in Educational Management Department from Tai Solarin University of Education and Enugu State University of Science and Technology (ESUST), Agbami, Enugu, Nigeria. A pilot study involving 30 lecturers from Enugu State University of Science and Technology (ESUST) was used to determine the internal consistency of the instrument using Cronbach alpha and an overall reliability coefficient value of 0.90 was obtained. Average revenue of the university obtained by adding students’ fees, revenue from consultancy services and government subvention was used as indicators for measuring sustainability of the universities. Data for the study were collected by the researchers with the help of three research assistants who were guided on the procedure to follow. The researcher and assistants visited the universities and administered copies on the instrument directly to the respondents. After three weeks, the research assistants collected the administered instruments from the respondents. This facilitated a high response rate of 589 copies (representing 95.6%) of the instrument with attrition rate of only 27 copies (representing 4.4%). Pearson Product Moment Correlation (PPMC) analysis was used to analyze data to answer data to the research questions. When p_{value} is less than significance level ($p < .05$), the research question is positive or otherwise.

RESULTS

Table 1: PPMC results on the sale of research and development (R&D) outputs and sustainability in state-owned universities in South-West Nigeria

Variables	N	Mean	Std. Dev	df	r _{value}	p _{value}
University Sustainability		15.6672	2.35056			
Sales of research outputs	589	15.9066	2.08732	587	.682	.001

Source: Field Survey, 2024

Table 1 shows that there was significant relationship between the independent variable and the dependent variable in the order of ($r = .682$, $p < .05$). This means that there is significant relationship between sales of research outputs and sustainability of state-owned universities in Southwest, Nigeria.

Table 2: PPMC results on the relationship between collaborative research initiatives with industries and sustainability of state-owned universities in Southwest Nigeria

Variables	N	Mean	Std. Dev	df	r _{value}	p _{value}
University Sustainability		15.6672	2.35056			
Collaborative research initiatives	589	22.5603	2.32522	587	.589	.020

Source: Field Survey, 2024

Table 2 shows that there was significant relationship between the independent variable and the dependent variable in the order of ($r = .589$, $p < .05$). This means that there is significant relationship between collaborative research initiatives and state-owned universities sustainability in Southwest, Nigeria.

Table 3: PPMC results on the relationship between technical inventions based on research results and sustainability of state-owned universities in Southwest Nigeria

Variables	N	Mean	Std. Dev	df	r _{value}	p _{value}
University Sustainability		15.6672	2.35056			
Technical inventions on research results	589	15.9949	2.22883	587	.357	.025

Source: Field Survey, 2024

Table 3 shows that there was significant relationship between the independent variable and the dependent variable in the order of ($r = .357$, $p < .05$). This means that there is significant relationship between technical inventions on research results and state-owned universities sustainability in Southwest, Nigeria.

DISCUSSION OF FINDINGS

The study's findings show that there is a favourable correlation between academic entrepreneurial innovations and sustainability of universities in South-West, Nigeria. This finding suggests that a rise in academic entrepreneurial innovations would only slightly improve the sustainability of universities. These results are consistent with those of Wang *et al.*, (2021), who demonstrated that entrepreneurial innovation positively influences entrepreneurial intention and that entrepreneurial knowledge acts as a mediator in the interaction between the two. Academic entrepreneurial innovations in terms of sales of research outputs, technical invention and collaborative research initiatives are found to be positively related with universities' sustainability. The results concur with those Ogunkoya and Hassan (2019) who reported that an organisation's profitability in Lagos State was significantly impacted by its entrepreneurial innovation strategy. The authors came to the conclusion that an organisation's profitability and competitiveness in Lagos State, Nigeria, are positively and significantly impacted by an entrepreneurial innovation strategy. According to Dorothea and Connie (2018), a positive academic environment fosters knowledge-sharing and encourages academics to become more entrepreneurial. Dorothea et al also reported that increased entrepreneurial orientation by academics can help universities modify their business models to satisfy the requirements of the industrial sector and achieve sustainability. According to Gontur *et al.*, (2016), there is a favourable correlation between an organisation's competitive advantage and innovation, as well as between entrepreneurial development and innovation. Additionally, the researchers' discovered that boosting organisational sustainability, competitiveness, and wealth creation requires the use of entrepreneurial innovation. This is in line with Pablo *et al.*, (2010 who noted that different factors impact on academics' entrepreneurial endeavours. The researchers' found that while prior entrepreneurial experience drives the identification of economic opportunities, other factors shape the process of detecting and exploiting entrepreneurial opportunities for the sustainability of the organisation.

Conclusion

An increasing number of stakeholders in tertiary education is worried about the viability and sustainability of state-owned universities. Based on the findings of the study that academic entrepreneurial innovations has a positive relationship with sustainability of state-owned universities, the study concluded that state government-owned universities in Southwest, Nigeria and other parts could be made more sustainable through academic innovations involving the sales of research outputs, joint research initiatives with businesses and technological inventions based on research findings.

Recommendations

Based on the findings and conclusion of the study, the following recommendations were made:

1. State-owned universities should embrace more academic entrepreneurial innovations through sale of research and development (R&D) outputs, collaborative research initiatives with industries, and technical inventions based on research results to industry to make more revenue for the system and enhance their sustainability.
2. Universities management should do more of investments in lecturers' capacity building in form of mentoring, conferences, workshops, seminars and ICT training to

- improve their knowledge and skills for conducting reputable research towards addressing industrial needs.
3. Senior lecturers and others in state-owned universities should provide mentoring programmes for younger and less-experienced colleagues through collaborative research with solid contents for knowledge sharing with the industry.
 4. State-owned universities should re-invent themselves as entrepreneurial and boundary-spanning hubs by collaborating diligently with industry players to increase their revenue-base through academic entrepreneurial innovations.

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