

INNOVATION IN VOCATIONAL AND TECHNICAL EDUCATION FOR SUSTAINABLE ECONOMIC DEVELOPMENT IN ADAMAWA CENTRAL, ADAMAWA STATE

Adama Suleiman Paris¹, Farida Gidado Sambo², Hapsatu Babajo³ & Rukaiya Isa Yahya⁴

^{1,2,4}Business Education Department, ³Agricultural Education Department
Federal College of Education, Yola. adamasuleimanparis@gmail.com

Abstract

Sustainable economic development is one of the most pressing concerns for many developing regions, particularly in Adamawa Central of Adamawa State, Nigeria. Vocational and Technical Education (VTE) has long been recognized as a key driver of economic growth, given its emphasis on skill acquisition and workforce development. However, in today's rapidly evolving economy, there is a growing need for innovation in VTE to ensure that students are equipped with modern, relevant skills that align with both local and global labor market demands. This paper investigates how innovation in VTE can foster sustainable economic development in Adamawa Central. A quantitative approach was adopted, using structured questionnaires distributed to educators, students, and administrators in FCE Yola. The data were analyzed using mean and standard deviation to explore the perceptions of innovation in VTE and its contribution to economic sustainability. The reliability coefficient (Cronbach's alpha) for the questionnaire was calculated at 0.82, indicating a high level of reliability. Findings suggest that although significant innovations have been introduced, challenges like insufficient funding and infrastructure continue to hinder the full potential of VTE to contribute to long-term economic growth. Policy recommendations and practical strategies for enhancing innovation in VTE are made as government should allocate more funds to VTE institutions to support the adoption of new technologies and innovative practices, Continuous training and professional development programs should be provided for VTE educators to equip them with the skills needed to implement innovative teaching methods.

Keywords: Innovation, VTE and Sustainable Economic Development

Introduction

Economic development in many African nations, including Nigeria, remains a priority as governments seek to reduce unemployment, improve living standards, and promote sustainable growth. Sustainable development is a lifetime process of evolution in which people take actions that leads to a development that meet the current needs without compromising the abilities of future generations to meet their own needs. (Aslam, 2019). It can be viewed as a persistent increase in economic, social and educational growth, leading to economic competitiveness, high standard of living, enhanced security and self-reliance. Sustainable development is a development that permits future generations to access well-being, self-esteem and freedom which can be attained through the proper implementation of entrepreneurship education. Nigeria is also confronted with daunting developmental challenges which pose serious threat

to socio-economic development and national security of the nation. These developmental challenges include endemic rural and urban poverty, high rate of unemployment, debilitating youth unemployment, low industrial output, unstable and deteriorating exchange rate, high inflation rate, inadequate physical and social infrastructure, very large domestic debt, and rising stock of external debt. Indeed, Nigeria has witnessed various forms of militancy, violence and crime including kidnappings, bandits Boko haram and the likes (Ajokorise, 2018).

Sustainable economic development is defined as an economic development which meets the needs of present generation and which would not endanger nor compromise the needs of future generation (Nagesha & Subrahmanya, 2016). It requires the integration of economic, environmental, and social goals. In the context of Yola, sustainable development would involve not only economic diversification but also the creation of jobs, poverty reduction, and inclusive growth through education and skills development (Suleiman, 2019). VTE plays a pivotal role in providing the labor force with relevant skills for sustainable industries, thus contributing to long-term economic stability. Sittisomboon, (2014), and Sutthirat (2016) identified and divided educational innovations into six types that includes: media and educational technology; instructional technique/pedagogy; curriculum; educational system; measure and evaluation; administration and management. However, Songkhram (2013) who noted that innovation is a products, techniques, new procedures, new knowledge that have been never happened or, existed products, techniques, procedures but revised or developed and good results

Innovation according to Ali (2015) is the application of better solutions that meet new requirements, unarticulated needs, or an existing market need. Songkhram (2013) noted that innovation is a product, techniques, new procedures, new knowledge that have never happened or, existed but revised or developed for good results. Innovation is the process of turning new ideas into practical reality as well as implementation of something new, a more effective device or a new process. A device/process is often described as an innovation, but in management science and other fields of practice and analysis, innovation is generally considered to be a process that brings together various novel ideas in a way that they have a noticeable impact on science, education, economy or society. Sintapanon (2014) and Sutthirat (2016) divided creative educational innovations into six types which includes: Media and educational technology, instructional technique/pedagogy, curriculum, Educational system, measure and evaluation and administration and management.

Vocational and Technical Education (VTE) is essential for equipping individuals with skills necessary for employability, entrepreneurship, and national development. With increasing global economic challenges, the role of innovation in VTE is critical to ensuring sustainable economic development. Innovation in VTE focuses on new teaching methods, modern curriculum development, and the integration of technology to meet the demands of a rapidly changing economy (Ogundele, 2018). Vocational education is seen as a key driver of sustainable development because it enhances employability and economic productivity. Research indicates that countries with strong VTE systems experience lower unemployment rates, higher labor force participation, and faster technological advancement (Obasi, 2020). In Nigeria, VTE institutions are increasingly recognized as important for addressing unemployment and fostering entrepreneurship. However, the integration of innovation into VTE remains a challenge due to outdated curricula, inadequate infrastructure, and limited funding (Oladipo, 2021).

However, Ajokorise, (2018) stated that innovations in higher education is facing across the globe including: pressures from globalisation; changing supply of and demand for higher education; and changes in higher education funding. They further recommend that building supportive relationships and trust between the relevant actors (students, academic staff, support staff, IT staff, managers and, where applicable, employers); Collect and analyse feedback information (from learners, institutions, employers etc) on performance and impact, and inform all relevant actors; Consider the needs of different actors including home and international students, academic and support staff, quality assurance agencies, employers and sponsoring bodies; Satisfy different national regulatory and quality assurance regimes amongst others. Innovation in VTE refers to the introduction of new ideas, methods, and technologies that improve educational outcomes and enhance skill development (Aslam, 2019). Innovations may involve curriculum reform, digital learning platforms, industry partnerships, and experiential learning approaches. VTE has traditionally focused on manual skills, but with rapid industrialization, there is a need for innovation to match labor market demands (Adeoye, 2020). These innovations foster the acquisition of technical, entrepreneurial, and soft skills required for economic growth and self-reliance.

Adamawa Central, located in Adamawa State, Nigeria, presents a unique case for studying the role of VTE in economic development. Despite its strategic location and population, the town faces significant socio-economic challenges, including high unemployment rates, limited industrialization, and underdeveloped infrastructure. Therefore, there is an urgent need to investigate how innovative approaches in VTE can help foster sustainable economic development in the region. This research is to assess the state of VTE in Adamawa Central, identify existing innovations, examine their contributions to economic development, and recommend strategies to enhance their effectiveness. Therefore, the following research objective were formulated to guide the study:

1. To assess the current state of innovation in VTE in Adamawa Central of Adamawa state.
2. To determine the contribution of these innovations to sustainable economic development in Adamawa Central of Adamawa state.
3. To identify the challenges faced by VTE institutions in implementing
4. innovative practices in Adamawa Central of Adamawa state.
5. To recommend strategies for enhancing the role of innovation in VTE for economic sustainability in Adamawa Central of Adamawa state.

Methodology

This study used a descriptive survey research design to gather data on the perceptions of the respondents in FCE Yola concerning innovation and its contribution to sustainable economic development. The survey method was chosen to provide a broad understanding of the current state of VTE in Yola and the opinions of those directly involved in its delivery. The population for this study consisted of VTE educators, students, and administrators from VTE departments in FCE Yola. A purposive sampling technique was used to select 150 respondents, comprising 50 VTE educators, 80 students, and 20 administrators. These respondents were selected for their direct involvement in the implementation and oversight of VTE programs. A structured questionnaire was developed to collect data from respondents. The questionnaire was divided

into two sections: Section A captured demographic information, while Section B focused on the key areas of innovation, challenges, and strategies for sustainable development in VTE. The questions were rated on a four-point Likert scale, where 1 represented "Strongly Disagree," and 4 represented "Strongly Agree." To ensure the validity of the questionnaire, experts in the field of VTE were consulted for their input on the content and structure of the instrument. A pilot study was also conducted with a small sample of 20 respondents from a different, but similar, population to assess the reliability of the instrument. The reliability coefficient (Cronbach's alpha) for the questionnaire was calculated at 0.82, indicating a high level of reliability. The data collected were analyzed using descriptive statistics, including mean and standard deviation. The mean scores were used to measure respondents' perceptions of innovation in VTE, while standard deviation provided insights into the variability of responses.

Data Analysis

Using the responses to the questionnaire items, the data analysis is conducted using mean and standard deviation (SD) to summarize the respondents' perceptions. The results are presented in tables for each research question

Table 1: Analyses on the innovations implemented in VTE institutions in in Adamawa Central of Adamawa state.

S/N	ITEMS		SD	DECISION
1	VTE institutions have introduced new teaching methods (e.g., project-based learning, flipped classrooms).	3.55	0.58	Agreed
2	ICT tools (computers, internet access, etc.) have been integrated into teaching and learning processes in VTE institutions.	3.63	0.49	Agreed
3	VTE institutions have established collaborations with industries for hands-on training and internships.	3.40	0.65	Agreed
4	VTE programs now include entrepreneurship education to foster self-employment among graduates.	3.60	0.52	Agreed
5	New assessment techniques (e.g., competency-based assessments) have been implemented in VTE institutions.	3.48	0.57	Agreed
GRAND MEAN and SD		3.53	0.56	Agreed

In table 1, the mean values for all items are above 3, indicating that respondents agree with the statements regarding the innovations implemented in VTE institutions. The highest agreement is on the integration of ICT tools (mean = 3.63), followed by entrepreneurship education (mean = 3.60). The responses are relatively consistent, as indicated by the low standard deviations.

Table 2: Analyses on the contribution of innovation in VTE for sustainable economic development in Adamawa Central of Adamawa state.

S/N	ITEMS	MEAN	SD	DECISION
1	The introduction of ICT tools in VTE has improved students' productivity and employability.	3.50	0.59	Agreed
2	VTE graduates with entrepreneurship skills have contributed to the growth of small businesses in the region.	3.58	0.53	Agreed
3	Industry collaborations with VTE institutions have enhanced job placement opportunities for graduates.	3.45	0.60	Agreed
4	Innovations in VTE have improved the quality of skills available in the labor market.	3.47	0.58	Agreed
5	The innovations in VTE are equipping graduates with the skills necessary for sustainable economic development in FCE Yola.	3.52	0.57	Agreed
GRAND MEAN and SD		3.50	0.57	Agreed

In table 2, the mean values reflect a strong agreement among respondents that innovations in VTE are contributing to sustainable economic development. The highest score (mean = 3.58) is related to entrepreneurship skills, which respondents believe play a key role in economic development through the growth of small businesses. The overall responses show consistency (SD = 0.53 to 0.60).

Table 3: Analyses on the challenges to the successful integration of innovations in VTE in Adamawa Central of Adamawa state.

S/N	ITEMS	MEAN	SD	DECISION
1	Inadequate funding limits the ability of VTE institutions to adopt new technologies.	2.80	0.79	Agreed
2	There is a lack of qualified instructors to implement innovative teaching practices in VTE institutions.	2.75	0.82	Agreed
3	Resistance to change among educators and administrators hinders the adoption of innovations.	2.90	0.77	Agreed
4	Insufficient infrastructure (e.g., labs, equipment) restricts the integration of new teaching and learning methods.	2.85	0.80	Agreed
5	Lack of policy support from the government affects the implementation of innovations in VTE.	2.70	0.85	Agreed
GRAND MEAN and SD		2.80	0.81	Agreed

In table 3, the mean scores indicate moderate agreement that funding, qualified instructors, resistance to change, infrastructure, and policy support are challenges to innovation

in VTE. The relatively lower means (below 3) indicate that respondents view these factors as barriers to successful innovation integration. The standard deviations show slightly more variation in opinions, especially regarding government support (SD = 0.85).

Table 4: Analyses on the strategies implemented to enhance innovation in VTE to ensure sustainable economic growth in Adamawa Central of Adamawa state.

S/N	ITEMS	MEAN	SD	DECISION
1	Increasing government funding for VTE institutions can enhance the adoption of innovative practices.	3.68	0.50	Agreed
2	Professional development and training for educators are essential for fostering innovation in VTE.	3.75	0.48	Agreed
3	Strengthening partnerships between VTE institutions and industries will enhance practical skill acquisition.	3.65	0.52	Agreed
4	Introducing modern equipment and facilities in VTE institutions will boost the implementation of innovative methods.	3.70	0.47	Agreed
5	Updating the VTE curriculum to align with global standards will support sustainable economic growth.	3.72	0.49	Agreed
GRAND MEAN AND SD		3.70	0.49	Agreed

In table 4, the high mean values (above 3.6) for all items indicate that respondents strongly agree that strategies such as increasing government funding, providing professional development, strengthening industry partnerships, modernizing equipment, and updating the curriculum are essential for enhancing innovation in VTE. The low standard deviations show that there is strong consensus on the effectiveness of these strategies.

Discussion of Findings

From the analysis, respondents reported a strong presence of innovations in VTE, particularly in the areas of ICT integration and entrepreneurship education. These innovations are seen as crucial to improving the quality of education and enhancing employability among VTE graduates in Adamawa Central of Adamawa state. Furthermore, the analysis suggests that innovations in VTE, especially entrepreneurship education and industry collaboration, contribute to sustainable economic development. VTE graduates are seen as contributors to small business growth and economic productivity in in Adamawa Central of Adamawa state. The findings also reveal that the major challenges identified include inadequate funding, insufficient infrastructure, lack of qualified instructors, and limited government support. These factors hinder the successful integration of innovations in VTE institutions. Finally, the respondents strongly believe that increasing government funding, providing continuous professional development, enhancing industry partnerships, upgrading infrastructure, and updating the curriculum are key strategies for promoting innovation in VTE. These strategies are essential for ensuring that VTE institutions can contribute effectively to sustainable economic growth especially in in Adamawa Central of Adamawa state.

Conclusions

The study concludes that innovation in VTE plays a critical role in promoting sustainable economic development in Adamawa Central of Adamawa state. Key innovations, particularly in ICT integration, entrepreneurship education, and industry collaboration, have significantly

improved the employability of VTE graduates and contributed to the local economy. However, challenges such as inadequate funding, outdated infrastructure, and a lack of qualified instructors hinder the full realization of innovation in VTE in Adamawa Central of Adamawa state.

Recommendations

Based on the findings of the study, the following recommendations are made:

- i. The government should allocate more funds to VTE institutions to support the adoption of new technologies and innovative practices.
- ii. Continuous training and professional development programs should be provided for VTE educators to equip them with the skills needed to implement innovative teaching methods.
- iii. VTE institutions should strengthen their collaboration with industries to ensure that students gain practical skills and exposure to real-world applications.
- iv. VTE institutions need to invest in modern equipment and facilities to create an environment conducive to innovation.
- v. The VTE curriculum should be regularly updated to align with global trends and address the evolving needs of the economy.

References

- Adeoye, A. (2020). Innovations in Vocational Education: Challenges and Prospects. *Educational Review*, 35(4), 112-130.
- Ajokorise, D. (2018) creativity and innovation in agricultural education. A veritable tool in economic growth in Nigeria. *Journal of Vocational and Technical Education*. 3 (1) 199 – 203.
- Ali, M. (2015). *Building a culture of creativity and innovation in higher education institutions*. Accessed online from: <https://www.linkedin.com/pulse/building-culturecreativity-innovation-higher-ali-mansouri>
- Aslam, M. (2019). The Role of Curriculum Reform in Vocational Education: A Case Study of Developing Economies. *International Journal of Vocational Studies*, 27(2), 78-96.
- Nagesha, N. and Subramanian, M. H. Bala (2006): Energy efficiency for sustainable development of Small industry clusters: what factors influence it? *The International Journal of Economic Policy Studies*, 1(7)
- Obasi, U. (2020). Economic Impact of VTE in Nigeria: An Empirical Investigation. *Journal of Economic Development and Policy*, 15(3), 101-118.
- Oladipo, K. (2021). Funding Vocational Education: The Nigerian Experience. *Journal of Educational Finance*, 9(1), 45-67.
- Ogundele, J. (2018). Skill Acquisition through VTE for National Development. *African Journal of Technical Education*, 14(2), 56-74.
- Sittisomboon, M. (2014). *Development of educational innovation*. Phitsanulok, Thailand: Naresuan University.
- Songkhram, N. (2013). *Creating innovation: Changed learners to innovators*. Bangkok, Thailand: Chulalongkorn University Press.
- Sutthirat, C. (2016). *80 Innovations with learner-centered approach* (7th ed.). Nonthaburi, Thailand: P Balance Design and Printing.
- Suleiman, A. (2019). VTE and Sustainable Development: Nigerian Perspectives. *Vocational and Technical Education Journal*, 11(3), 65-79.